EUROPEAN CONGRESS OF RADIOLOGY

ECR 2022

BOOK OF ABSTRACTS

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the annual meeting of

EUROPEAN SOCIETY OF RADIOLOGY

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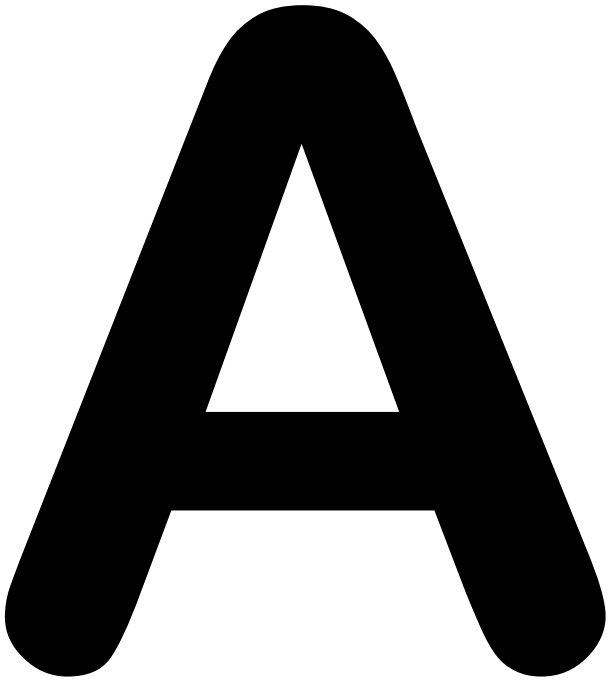

ECR 2022
Postgraduate Educational Programme – March 2-6, 2022

European Excellence in Education (E^3)
Joint Sessions
New Horizons Sessions (NH)
Open Forum Sessions (OF)
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Round Table Sessions (RT)
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Wednesday, March 2

08:00-09:00 **Channel 2**

Special Focus Session

SF 1
Imaging signs in neuroradiology

SF 1-1
Chairperson's introduction
C. A. J. Romanowski; Sheffield/UK
(charles.romanowski@nhs.net)

SF 1-2
Lesions of the basal ganglia and thalami
J. Bladowska; Wroclaw/PL
(joanna.bladowska@umw.edu.pl)

Learning Objectives:
1. To review the anatomy of the basal ganglia and thalami.
2. To describe the imaging findings of the most common pathologies.
3. To discuss the key findings that may be useful for differential diagnosis.

SF 1-3
Pseudotumours in neuroradiology and head and neck imaging
B. F. Schuknecht; Zurich/CH
(bschuknecht@mri-roentgen.ch)

Learning Objectives:
1. To identify and categorise pseudotumours based on location and imaging signs.
2. To tailor examination techniques to specific pathologies.
3. To differentiate pseudotumours from alternative/differential diagnoses.

SF 1-4
White spots of the white matter
J. M. Wardlaw; Edinburgh/UK
(joanna.wardlaw@ed.ac.uk)

Learning Objectives:
1. To discuss white spots of vascular origin, known as white matter hyperintensities (WMH), or white matter lesions of presumed vascular origin.
2. To review the relevance of the patient's age and the risk of dementia, stroke, and death.
3. To differentiate from other common causes of WMH and review the pros and cons of visual rating scales and computational volume measures.
4. To discuss the available interventions to prevent WMH worsening.
Author Disclosures:
Joanna M. Wardlaw: Grant Recipient: RC UK, various research charities, EU H2020, Fondation Leducq, funds the work presented in the talk; Research Grant/Support: see Grant recipient above

Panel discussion: Black spots in the brain: cerebral microhaemorrhages

08:00-09:00 **Channel 3**

Refresher Course: Cardiac

RC 103
Multimodality imaging of cardiovascular inflammation

RC 103-1
Chairperson's introduction
G. Feuchtner; Innsbruck/AT
(Gudrun.Feuchtner@i-med.ac.at)

RC 103-2
Myocarditis: has COVID-19 changed our perspective?
M. Francone; Milan/IT
(marco.francone@hunimed.eu)

Learning Objectives:
1. To become aware of the pathogenesis and prevalence of myocardial involvement in COVID-19.
2. To review the spectrum of cardiac MRI findings characterising COVID-19 myocarditis and to become aware of the various differential diagnoses of myocardial damage associated with the SARS-CoV2 infection.
3. To discuss possible imaging pathways to follow-up patients with a previous infection and recognise chronic cardiovascular sequalae of COVID-19.

RC 103-3
Vasculitis: which is the best test?
V. E. Sinitsyn; Moscow/RU
(vsini@mail.ru)

Learning Objectives:
1. To learn about the classification of vasculitis based on vessel size and their major clinical manifestations.
2. To become aware of the key imaging findings in vasculitis.
3. To learn about the modern recommendations for imaging of vasculitis and understand the disadvantages and limitations of ultrasound, CTA, MRA, and PET/CT and PET/MRI.
Author Disclosures:
Valentin E. Sinitsyn: Speaker: Bayer, GE, Soemens, Philips, Canon

RC 103-4
Endocarditis: a difficult diagnosis
R. P. J. Budde; Rotterdam/NL
(r.budde@erasmusmc.nl)

Learning Objectives:
1. To discuss the role of imaging in the diagnosis of endocarditis.
2. To become familiar with the CT and PET/CT imaging findings that indicate endocarditis.
3. To discuss the role of the radiologist in the endocarditis team.

Panel discussion: Is hybrid imaging the answer?

09:30-10:30 **Channel 1**

Round Table Session

RT 2
Adaptations of screening programmes during the COVID pandemic: what is the impact?

RT 2-1
Chairpersons' introduction
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To learn about the status of colorectal cancer screening in Europe and know how the screening program was affected by the COVID-19 pandemic.
2. To learn about the effects and lessons learned from changing and adapting cancer screening programmes during Covid-pandemic.

RT 2-3
Changes and adaptations in breast cancer screening during COVID pandemic
F. J. Gilbert; Cambridge/UK
(fjg28@cam.ac.uk)
Author Disclosures:
Fiona J. Gilbert: Consultant: Google, Kheiron; Research Grant/Support: GE Healthcare, Bayer, Hologic

RT 2-4
Changes and adaptations in bowel cancer screening during COVID pandemic
E. Dekker; Amsterdam/NL
(e.dekker@amsterdamumc.nl)
Author Disclosures:
Evelien Dekker: Consultant: FujiFilm, Olympus, GI Supply, CPP-FAP, PAION and Ambu; Research Grant/Support: FujiFilm; Speaker: Olympus, GI Supply, Norgine, IPSEN, PAION and FujiFilm

RT 2-5
Discussion
E. Dekker; Amsterdam/NL
F. J. Gilbert; Cambridge/UK
(fjg28@cam.ac.uk)
G. L. Beets; Amsterdam/NL
(g.beets@nki.nl)
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)
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Evelien Dekker: Consultant: FujiFilm, Olympus, GI Supply, CPP-FAP, PAION and Ambu; Research Grant/Support: FujiFilm; Speaker: Olympus, GI Supply, Norgine, IPSEN, PAION and FujiFilm
Fiona J. Gilbert: Consultant: Google, Kheiron; Research Grant/Support: GE Healthcare, Bayer, Hologic

09:30-10:30 **Channel 2**

Special Focus Session

SF 2c
The many faces of metastases

SF 2c-1
Chairperson's introduction
A. Laghi; Rome/IT
(andrea.laghi@uniroma1.it)
Author Disclosures:
Andrea Laghi: Speaker: Bracco, GE Healthcare, Bayer, Guerbet

SF 2c-2
Pulmonary metastases: not always just nodules
C. M. Schaefer-Prokop; Amersfoort/NL
(cornelia.schaeferprokop@gmail.com)

Learning Objectives:
1. To describe typical and atypical imaging features of pulmonary metastases.
2. To demonstrate the appropriate imaging workflow to improve characterisation.
3. To discuss patient management (follow-up, tissue sampling, and surgery).

SF 2c-3
Typical and atypical abdominal metastases
A. Luciani, E. Reizine; Crétail/FR
(alain.luciani@aphp.fr)

Learning Objectives:
1. To describe typical and atypical imaging features of abdominal metastases.
2. To demonstrate the appropriate imaging workflow to improve characterisation.
3. To discuss patient management (follow-up, tissue sampling, and surgery).

SF 2c-4
Typical and atypical skeletal metastases
F. E. Lecouvet; Brussels/BE
(frederic.lecouvet@uclouvain.be)

Learning Objectives:
1. To describe typical and atypical imaging features of skeletal metastases.
2. To demonstrate the appropriate imaging workflow to improve characterisation.
3. To discuss patient management (follow-up, tissue sampling, and surgery).

Panel discussion: What are the lessons learned?

09:30-10:30 **Channel 3**

Refresher Course: Paediatric

RC 212
Artificial intelligence (AI) applications in paediatrics

RC 212-1
Chairperson's introduction
E. Sorantin; Graz/AT
(erich.sorantin@medunigraz.at)

RC 212-2
Human versus artificial intelligence
L. G. Astrakas; Ioannina/GR
(astrakas@uoi.gr)

Learning Objectives:
1. To understand the basic principles of AI.
2. To learn about the current limitations of AI.
3. To discuss the role of AI in supporting paediatric radiologists.

RC 212-3
Current and emerging chest applications
S. Schalekamp; Nijmegen/NL
(steven.schalekamp@gmail.com)

Learning Objectives:
1. To understand the current spectrum of available AI applications for chest radiology.
2. To learn about the emerging AI applications within paediatric chest radiology.
3. To discuss the future directions of AI in paediatric chest radiology.

RC 212-4
Current and emerging musculoskeletal applications
A. C. Offiah; Sheffield/UK
(a.offiah@sheffield.ac.uk)

Learning Objectives:
1. To understand the current spectrum of available AI applications for paediatric musculoskeletal radiology.
2. To learn about the emerging AI applications within paediatric musculoskeletal radiology.
3. To discuss the future directions of AI in paediatric musculoskeletal radiology.
Author Disclosures:
Amaka C. Offiah: Author: Paper written with Visiana; Speaker: For Visiana; Other: On-going research project with Gleamer and AZMed

Panel discussion: How can paediatric radiologists acquire the large datasets required to develop robust AI models?

11:30-12:30 **Channel 1**

Trailer Session

TS 3
Acute pancreatitis

Moderator
R. Manfredi; Rome/IT
Author Disclosures:
Riccardo Manfredi: Speaker: Bracco, Schering

TS 3-2
Atlanta Classification of acute pancreatitis
T. Bollen; Nieuwegein/NL
(tlbollen@hotmail.com)

Learning Objectives:
1. To understand grading of acute pancreatitis using the Atlanta classification.
2. To learn about the clinical impact of the Atlanta classification.
3. To understand the follow-up of acute pancreatitis.

TS 3-3
Role of imaging
C. Triantopoulou; Athens/GR
(ctriantopoulou@gmail.com)

Learning Objectives:
1. To learn about diagnosing acute pancreatitis.
2. To understand how to apply the Atlanta classification to imaging.
3. To learn about new trends in the diagnosis of acute pancreatitis.

11:30-12:30 **Channel 2**

Refresher Course: Genitourinary

RC 307
COVID-19 in the GU-tract: what do we know today?

RC 307-1
Chairperson's introduction
L. E. Derchi; Genoa/IT
(lorenzo.derchi1@gmail.com)

RC 307-2
Kidneys and COVID-19: what can we do with imaging?
A. Tagliafico; Genoa/IT
(atagliafico@sirm.org)

Learning Objectives:
1. To describe COVID-19-related kidney involvement on imaging.
2. To assess how we can use imaging to screen for potential kidney damage in COVID-19.
3. To describe the contribution of imaging on kidney evaluation in COVID-19.

RC 307-3
Infection of the urinary tract and COVID-19: is there a relationship?
M. Prokop; Nijmegen/NL

Learning Objectives:
1. To define the typical findings of renal involvement of COVID-19.
2. To identify the best imaging technique to assess infection of the urinary tract in COVID-19 patients.
3. To be able to identify the differential diagnosis of urinary tract infection.

RC 307-4
Effects of COVID-19 on the urogenital system in fragile and ultra-fragile patients
M.-F. Bellin, M. Zaidan; Le Kremlin-Bicêtre/FR
(marie-france.bellin@aphp.fr)

Learning Objectives:
1. To list and describe the main effects of COVID-19 reported in the literature on the urogenital system in fragile and ultra-fragile patients.
2. To identify and discuss the main risks associated with COVID-19 in fragile and ultra-fragile patients.
3. To describe the role of radiologists in the multi-disciplinary management of these patients.

Panel discussion: When do we need to perform imaging, which technique is best for the primary diagnosis, and when do we need to perform follow-up?

11:30-12:30 **Channel 3**

Refresher Course: Radiographers

RC 314
Evolving research and practice in orthopaedics

RC 314-1
Chairpersons' introduction
N. H. Woznitza; London/UK
(nicholas.woznitza@nhs.net)
M. F. Reiser; Munich/DE
(Maximilian.Reiser@med.uni-muenchen.de)
Author Disclosures:
Nicholas Hans Woznitza: Consultant: InHealth Reporting, SMR; Research Grant/Support: CRUK, SBRI, NHSX AAC

RC 314-2
Applications of 3D bioprinting in MSK
S. Durante; Bologna/IT

Learning Objectives:
1. To summarise musculoskeletal 3D bioprinting technology.
2. To compare the current achievements of 3D bioprinting in in-vivo applications.
3. To discuss the future potential of 3D cell-printing technology.

RC 314-3
Medical image analysis to optimise surgical planning
J. Chen; Exeter/UK
(J.Chen3@exeter.ac.uk)

Learning Objectives:
1. To describe examples of virtual surgery and computer-aided surgery.
2. To discuss the framework for converting images into models.
3. To identify the challenges in medical imaging for computer-aided techniques.

RC 314-4
Enhancing paediatric MSK imaging using low dose bi-plane technology
B. R. Mussmann; Odense/DK
(bo.mussmann@rsyd.dk)

Learning Objectives:
1. To describe bi-plane scanner technology.
2. To discuss the clinical application of bi-plane technology.
3. To distinguish the benefits and challenges of bi-plane imaging for paediatric patients.

Panel discussion: Translating cutting edge MSK imaging innovations into daily practice

13:00-14:00 **Channel 1**

Trailer Session

TS 4
The role of the radiologist in 2030

Moderators
R. G. H. Beets-Tan; Amsterdam/NL
M. H. Fuchsjäger; Graz/AT

Learning Objectives:
This trailer session will give an outlook to one of the highlights professional discussions that will be held during ECR 2022 July 13-17. This session will address the future of radiology and the important role of the radiologist in the multidisciplinary patient management. A panel of radiologists, clinician and patient advocate will share their perspectives on how radiologists should practice adding value to the patient outcome.

TS 4-2
The new role of the radiologist: report from the ESR survey
A. G. Rockall; London/UK
(a.rockall@imperial.ac.uk)

TS 4-3
Panel discussion: Radiology in 2030: how will we need to practice adding value to the patient?
A. G. Rockall; London/UK
(a.rockall@imperial.ac.uk)
G. L. Beets; Amsterdam/NL
(g.beets@nki.nl)
C. Justich; Vienna/AT
(cjustich@me.com)
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)
E. Briers; Hasselt/BE
(erikbriers@telenet.be)
Author Disclosures:
Caroline Justich: Advisory Board: chairi ESR PAG; Founder: Beaccepted
Emanuele Neri: Advisory Board: QUIBIM, Deep Mammo, Synlab; Speaker: Ge/Healthcare; Ebit/ESAOTE

TS 4-4
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

13:00-14:00 **Channel 2**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESR

BS 4b

Musculoskeletal: lower extremities

Moderator
J.-L. Drapé; Paris/FR

BS 4b-2
The degenerative hip
U. Aydingoz; Ankara/TR
(uaydingo@hacettepe.edu.tr)

Learning Objectives:
1. To learn about imaging methods in degenerative hip evaluation.
2. To learn about imaging features in the degenerative hip.

BS 4b-3
The degenerative knee
J. L. M. A. Gielen; Antwerp/BE
(jan.gielen@uza.be)

Learning Objectives:
1. To learn about imaging methods in degenerative knee evaluation.
2. To learn about imaging features in the degenerative knee.

BS 4b-4
The degenerative ankle
A. H. Karantanas; Iraklion/GR
(akarantanas@gmail.com)

Learning Objectives:
1. To learn about imaging methods in degenerative ankle evaluation.
2. To learn about imaging features in the degenerative ankle.

13:00-14:00 **Channel 3**

Refresher Course: Emergency Imaging

RC 417

Controversial issues in imaging COVID-19 patients in the emergency setting

RC 417-1
Chairperson's introduction
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)
Author Disclosures:
Marie-Pierre Revel: Consultant: GE Healthcare; Investigator: GE Healthcare; Research Grant/Support: GE Healthcare

RC 417-2
Classification and scoring systems of COVID-19 imaging findings
I. Blazic; Belgrade/RS
(ivanablazic@yahoo.com)

Learning Objectives:
1. To learn about COVID-19 imaging findings scoring systems defined in the previous studies.
2. To recognise which scoring system is generally accepted by radiology communities.
3. To seek out the correlation between COVID-19 imaging scoring systems and the clinical outcome of patients.

RC 417-3
Differential diagnosis of lung ground-glass opacities in COVID-19 pandemic
A. R. Larici; Rome/IT
(annarita.larici@unicatt.it)

Learning Objectives:
1. To learn about the differential diagnosis in patients presenting to the emergency department with ground-glass opacity on CT.
2. To become familiar with the imaging findings of COVID-19 patients in the early phase of the disease.
3. To understand when it is possible to make differential diagnosis.

RC 417-4
Who would benefit from urgent chest imaging and which imaging strategy is the best?
L. Gorospe Sarasua; Madrid/ES
(luisgorospe@yahoo.com)

Learning Objectives:
1. To learn about the recommendations for selecting patients who require urgent imaging.
2. To become familiar with the adequate indications for performing CT with IV.
3. To describe the CT findings that have an impact on management.

Panel discussion: How can we integrate imaging to orient patient management?

15:00-16:00 **Channel 1**

Trailer Session

Jointly organised by the ESR, ESSO, and ESTRO

TS 5

Rectal cancer: a multidisciplinary approach

TS 5-1
Chairperson's introduction
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To understand which questions are clinically relevant.
2. To learn about the relevant MRI findings and their impact on treatment choice.
3. To learn about new treatment strategies, including organ preservation.
4. To understand the role of MRI for selection and follow up.
5. To give an outlook to the highlight Multidisciplinary program at ECR 2022.

TS 5-2
Lessons from the surgeon
G. L. Beets; Amsterdam/NL
(g.beets@nki.nl)

TS 5-3
Lessons from the radiation oncologist
V. Valentini; Rome/IT
(vincenzo.valentini@policlinicogemelli.it)
Author Disclosures:
Vincenzo Valentini: Research Grant/Support: MSD, Pfizer, Radius, Varian, Elekta

TS 5-4
Lessons from the radiologist: case-based discussion
R. G. H. Beets-Tan; Amsterdam/NL

TS 5-5
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

15:00-16:00 **Channel 2**

Special Focus Session

SF 5

Contemporary issues in ultrasound imaging of the head and neck

SF 5-1
Chairperson's introduction
M. G. Mack; Munich/DE
(m.mack@radiologie-muenchen.de)

SF 5-2
Primary tumours of the head and neck
T. Beale; London/UK
(tim.beale@nhs.net)

Learning Objectives:
1. To understand the role of ultrasound in the assessment of primary tumours in the head and neck.
2. To highlight the advantages and pitfalls of ultrasound in head and neck tumours.
3. To describe a practical ultrasound technique for assessing head and neck tumours.

SF 5-3
Salivary glands
K. S. S. Bhatia; London/UK
(kunwarssb@gmail.com)

Learning Objectives:
1. To explore the current role of ultrasound in the evaluation of the major salivary glands.
2. To illustrate the sonographic features of neoplastic and non-neoplastic salivary pathologies.
3. To highlight several practical tips and potential pitfalls in salivary ultrasound interpretation.

SF 5-4
Thyroid gland
A. S. McQueen; Newcastle/UK
(andrew.mcqueen1@nhs.net)

Learning Objectives:
1. To review the current status of ultrasound in thyroid nodule risk stratification.
2. To describe the potential uses and technical challenges of multiparametric ultrasound in thyroid imaging.
3. To explore the integration of artificial intelligence into a patient-centric thyroid ultrasound service.

Panel discussion: What is important in everyday practice?

15:00-16:00 **Channel 3**

Refresher Course: Emergency Imaging

RC 517

Emergencies in oncologic patients: imaging approach and impact of complication findings

RC 517-1
Chairperson's introduction
R. Basilico; Chieti/IT
(rbasilic@unich.it)

RC 517-2
Oncology patients in ED with neurological symptoms: the role of imaging
M. Dumba; London/UK

Learning Objectives:
1.To be able to compare and contrast appropriate imaging techniques available in oncologic emergencies of the CNS.
2. To distinguish the imaging features of common primary and secondary CNS oncological pathologies to formulate a differential diagnosis.
3. To recognise the imaging features of life-threatening conditions in the CNS resulting from neoplastic causes or treatment-related complications.

RC 517-3
Mass, emboli, toxication, and immune mediated disease: malignancy-related emergencies in the chest
F. Berger; Munich/DE
(Frank.Berger@med.uni-muenchen.de)

Learning Objectives:
1. To learn about imaging features of oncology patients presenting to the emergency department with respiratory symptoms.
2. To differentiate between oncologic and non-oncologic causes of lung emergencies.
3. To become familiar with imaging features of cancer treatment-related changes in the lungs, including effects of cytotoxic and molecular targeted therapies.

RC 517-4
Abdominal emergencies in oncologic patients: obstruction, perforation, and vascular impairment
A. Platon; Geneva/CH
(alexandra.platon@hcuge.ch)

Learning Objectives:
1. To become familiar with the most frequent causes of acute abdomen emergencies in oncologic patients.

2. To learn about the imaging algorithm in oncology patients presenting to the emergency department with acute abdominal pain.
3. To become familiar with vascular impairment findings in abdominal viscera of oncologic patients.

Panel discussion: Does the imaging approach differ from other emergency settings in patients with suspected oncologic emergencies?

16:30-17:30 **Channel 1**

Trailer Session

TS 6
Pros and Cons

Part 1: Intermediate risk screening should be done with breast MRI and not with contrast-enhanced mammography

TS 6-1
Introduction by the president
R. G. H. Beets-Tan; Amsterdam/NL

TS 6-2
Chairperson's introduction
T. H. Helbich; Vienna/AT
Author Disclosures:
Thomas H. Helbich: Research Grant/Support: hologic, guerbet, bracco, siemens, novomed

TS 6-3
PRO
R. M. Mann; Nijmegen/NL
(r.mann@rad.umcn.nl)

Learning Objectives:
This house believes that intermediate risk screening should be done with breast MRI and not with contrast-enhanced mammography.
Author Disclosures:
Ritse M. Mann: Advisory Board: Screenpoint medical; Consultant: Bayer, Siemens; Grant Recipient: Bayer, Siemens, Medtronic, BD, Screenpoint, Seno

TS 6-4
CON
M. B. I. Lobbes; Maastricht/NL

Learning Objectives:
This house believes that intermediate risk screening should NOT be done with breast MRI but with contrast-enhanced mammography.
Author Disclosures:
Marc B.I. Lobbes: Speaker: GE, Tromp

Panel discussion: Will we need to use contrast agents in screening?

Part 2: Evaluating patients with stable cardiac chest pain: non-invasive anatomical coronary artery imaging should be the first-line investigation for all patients

TS 6-5
Chairperson's introduction
R. Vliegenthart; Groningen/NL
(r.vliegenthart@umcg.nl)
Author Disclosures:
Rozemarijn Vliegenthart: Research Grant/Support: Siemens Healthineers; Speaker: Siemens Healthineers, Bayer

TS 6-6
PRO
F. Bamberg; Freiburg/DE
(fabian.bamberg@uniklinik-freiburg.de)

Learning Objectives:
This house believes that, when evaluating patients with stable cardiac chest pain, non-invasive anatomical coronary artery imaging should be the first-line investigation for all patients.
Author Disclosures:
Fabian Bamberg: Research Grant/Support: Siemens Healthineers, Bayer Healthcare; Speaker: Siemens Healthineers, Bayer Healthcare

TS 6-7
CON
R. Manka; Zurich/CH

Learning Objectives:
This house believes that, when evaluating patients with stable cardiac chest pain, non-invasive anatomical coronary artery imaging should NOT be the first-line investigation for all patients.
Author Disclosures:
Robert Manka: Speaker: Bayer

Panel discussion: Is a single test sufficient in all patients? Are imaging departments ready and prepared to provide these diagnostic services?

TS 6-8
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

16:30-17:30 **Channel 2**

E^3 - European Diploma Prep Sessions

E^3 623
Urogenital

E^3 623-1
Chairperson's introduction
V. Panebianco; Rome/IT
(valeria.panebianco@uniroma1.it)

Learning Objectives:
To become familiar with the imaging presentation of common neoplastic and infectious disorders of the kidneys. To describe the typical imaging features of obstructive uropathy and neoplastic disorders of the ureter and bladder. To understand the imaging presentation of benign and malignant disorders of the prostate.

E^3 623-2
Renal and adrenal imaging
N. Grenier; Bordeaux/FR
(nicolas.grenier@chu-bordeaux.fr)

Learning Objectives:
1. To describe the normal imaging anatomy and variants of the kidneys and the adrenal glands.
2. To understand the imaging features of benign and malignant tumours of the kidneys.
3. To describe the imaging features of benign and malignant tumours of the adrenal glands.
4. To explain the imaging features of infectious disorders of the kidneys.

E^3 623-3
Imaging of the ureter and bladder
H. A. Vargas; New York, NY/US

Learning Objectives:
1. To explain the imaging anatomy and variants of the ureter and bladder.
2. To understand the diagnostic evaluation and imaging features of obstructive uropathy.
3. To describe the imaging features of benign and malignant tumours of the ureter and bladder.

E^3 623-4
Prostate imaging
I. Caglic; Cambridge/UK
(iztokcaglic@gmail.com)

Learning Objectives:
1. To describe the MRI anatomy of the prostate.
2. To describe the imaging features of benign prostatic hypertrophy.
3. To understand the imaging features of inflammatory disorders of the prostate.
4. To explain the imaging features of prostate cancer using the prostate imaging reporting and data system (PIRADS).

16:30-17:30 **Channel 3**

Refresher Course: Chest

RC 604
Eosinophilic lung diseases (ELDs)

RC 604-1
Chairperson's introduction
M. O. Wielpütz; Heidelberg/DE
(wielpuetz@uni-heidelberg.de)
Author Disclosures:
Mark O. Wielpütz: Grant Recipient: Vertex Pharmaceuticals, Boehringer Ingelheim; Investigator: Vertex Pharmaceuticals

RC 604-2
Clinico-pathologic classification
P. Graziano; San Giovanni Rotondo/IT
(p.graziano@operapadrepio.it)

Learning Objectives:
1. To identify the pathologic features of eosinophilic lung diseases.
2. To list the causes of eosinophilic lung diseases according to morphologic features.
3. To discuss the main differential diagnosis harmonising clinico-pathologic features.

RC 604-3
Eosinophilic lung diseases of known cause
A. Nair; London/UK

Learning Objectives:
1.To list the causes of secondary pulmonary eosinophilic lung diseases.
2. To compare and to contrast the CT findings of the commonest secondary eosinophilic lung diseases, in particular: allergic bronchopulmonary aspergillosis (ABPA), bronchocentric granulomatosis, and eosinophilic granulomatosis with polyangiitis (EGPA).
3. To reflect on the differential radiologic diagnosis for eosinophilic lung diseases.
Author Disclosures:
Arjun Nair: Advisory Board: Aidence BV; Consultant: Consultation fees, MSD; Research Grant/Support: UK Biomedical Research Committee; Speaker: Speaker fees, Astra Zeneca

RC 604-4
Eosinophilic lung diseases of unknow cause
G. Chassagnon; Paris/FR
(gchassagnon@gmail.com)

Learning Objectives:
1. To classify eosinophilic lung diseases of unknow cause.
2. To identify situations causing acute eosinophilic pneumonia.
3. To diagnose chronic eosinophilic pneumonia.

Panel discussion: The spectrum of eosinophilic lung diseases

Thursday, March 3

08:00-09:00 **Channel 2**

E³ - European Diploma Prep Sessions

E³ 723
Paediatric

E³ 723-1
Chairperson's introduction
J.-F. Chateil; Bordeaux/FR
(jean-francois.chateil@chu-bordeaux.fr)

Learning Objectives:
To understand the imaging features of the most common congenital and neoplastic disorders of the brain in children and adolescents. To describe the imaging presentations of the most common disorders of the lung and mediastinum in the paediatric age group. To become familiar with the imaging features of important congenital, acute, and neoplastic diseases of the abdomen in children and adolescents.

E³ 723-2
Paediatric neuroimaging
M. I. Argyropoulou; Ioannina/GR

Learning Objectives:
1. To become familiar with the normal development of the brain.
2. To learn about the most common congenital disorders of the brain.
3. To learn about the most common brain tumours in children.

E³ 723-3
Paediatric chest imaging
C. Owens; London/UK
(owenscatherine.5@gmail.com)

Learning Objectives:
1. To describe the normal development of the lung and mediastinum.
2. To explain the imaging features of congenital disorders of the lung and mediastinum.
3. To understand the imaging manifestations of respiratory distress and bronchopulmonary dysplasia in infants.
4. To describe the most common tumours of the chest in children.

E³ 723-4
Paediatric abdominal imaging
J. Barber; London/UK

Learning Objectives:
1. To understand the imaging features of congenital disorders of the abdomen.
2. To describe the diagnostic evaluation and imaging presentation of the most common emergencies in children according to age.
3. To understand the imaging presentation of the most common oncologic disorders of the abdomen in children.

08:00-09:00 **Channel 3**

Refresher Course: Radiographers

RC 714
Dose reduction strategies to enhance safety

RC 714-1
Chairpersons' introduction
E. Agadakos; Athens/GR
(eagadakos@gmail.com)
A. Gangi; Strasbourg/FR
(Afshin.Gangi@chru-strasbourg.fr)
Author Disclosures:
Efthimios Agadakos: Board Member: ISRRT
Afshin Gangi: Patent Holder: Apriomed

RC 714-2
Application of virtual grids
R. Toomey; Dublin/IE

Learning Objectives:
1. To describe the basic concepts of the virtual grid.
2. To consider current, potential, and proposed future clinical applications of virtual grids.
3. To summarise the current research evidence regarding the impact of virtual grids on both image quality and patient radiation dose.

RC 714-3
CT dose optimisation updates
S. D. Mørup; Odense/DK
(sdmo@ucl.dk)

Learning Objectives:
1. To describe the CT optimisation technologies.
2. To reflect on how the different technologies can be combined in optimising radiation dose.
3. To identify how CT optimisation technologies influence image quality.

RC 714-4
Safety improvements in interventional imaging
R. Gerasia; Palermo/IT
(roberta.gerasia@gmail.com)

Learning Objectives:
1. To describe a practical approach of occupational and patient dose reduction strategies.
2. To analyse how the customisation of the angiographic system improves radiation dose reduction.
3. To examine how real-time patient and staff radiation dose monitoring systems can optimise radiation protection.

Panel discussion: How well are we adapting to new technologies?

10:30-11:30 **Channel 1**

Round Table Session

RT 8
Building bridges: interventional oncology, one of the four pillars in cancer care

RT 8-1
Chairpersons' introduction
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)
C. Catalano; Rome/IT
(Carlo.Catalano@uniroma1.it)

Learning Objectives:
1. To learn about interventional oncology as one of the four pillars in cancer care.
2. To understand the complementary role of interventional oncology to that of surgical oncology, medical oncology and radiation oncology.
3. To discuss the importance of collaboration between these disciplines for (cost)efficient treatment and better outcome for the patient and to recognise cancer care as a continuum of care.
4. To recognise the synergy when the four disciplines team up together in clinics and in research.

RT 8-2
Interventional oncology: one of the four pillars in cancer care
T. K. Helmberger; Munich/DE
(Thomas.Helmberger@klinikum-muenchen.de)

RT 8-3
Surgical oncology: towards minimally invasive
G. Torzilli; Milan/IT
(guido.torzilli@hunimed.eu)

RT 8-4
Medical oncology: complementary to local treatment
A. Cervantes; Valencia/ES
(andres.cervantes@uv.es)
Author Disclosures:
Andres Cervantes: Advisory Board: Merck Serono, Roche, Beigene, Takeda and Astelas.; Board Member: ESMO; Investigator: Genentech, Merck Serono, Roche, Beigene, Bayer, Servier, Lilly, Novartis, Takeda, Astelas, Fibrogen, Natera, Astra Zeneca, Medimmune, BMS, MSD.; Research Grant/Support: Genentech, Merck Serono, Roche, Beigene, Bayer, Servier, Lilly, Novartis, Takeda, Astelas, Fibrogen, Natera, Astra Zeneca, Medimmune, BMS, MSD; Speaker: Merck Serono, Roche, Angem, Foundation Medicine.

RT 8-5
Discussion
T. K. Helmberger; Munich/DE
(Thomas.Helmberger@klinikum-muenchen.de)
A. Gangi; Strasbourg/FR
(Afshin.Gangi@chru-strasbourg.fr)
A. Brady; Cork/IE
(adrianbrady@me.com)
G. Torzilli; Milan/IT
(guido.torzilli@hunimed.eu)
A. Cervantes; Valencia/ES
(andres.cervantes@uv.es)
Author Disclosures:
Afshin Gangi: Patent Holder: Apriomed

10:30-11:30 **Channel 2**

Joint Session of the ESR and EORTC

ESR/EORTC

Imaging and treatment of oligometastatic breast cancer

ESR/EORTC-1
Chairperson's introduction
N. M. deSouza; Sutton/UK

ESR/EORTC-2
Clinical relevance of oligometastatic disease in breast cancer patients
D. Pasquier; Lille/FR
(d-pasquier@o-lambret.fr)

Learning Objectives:
1. To learn about the definition of oligometastatic disease.
2. To appreciate the therapeutic potentials of radiation oncology for oligometastatic disease.
3. To understand the clinical relevance of oligometastatic breast cancer.

ESR/EORTC-3
Advanced imaging and future perspective in oligometastatic breast cancer
L. F. de Geus-Oei; Leiden/NL

Learning Objectives:
1. To learn about the current standards in breast cancer imaging.
2. To appreciate the differences in the diagnostic performance of the available imaging modalities for lesion detection in oligometastatic breast cancer.
3. To understand the future developments in diagnostic imaging for breast cancer detection.

ESR/EORTC-4
Incorporating advanced imaging into clinical trials: EORCT IG recommendations
F. E. Lecouvet; Brussels/BE
(frederic.lecouvet@uclouvain.be)

Learning Objectives:
1. To become aware of the impact of imaging generation on patient stratification and response assessment.
2. To appreciate the role of imaging for end-points evaluation in clinical trials and research.
3. To understand how to design trials evaluating optimal imaging strategies in oligometastatic breast cancer.

Panel discussion: What is the future of imaging in oligometastatic breast cancer? Challenges and opportunities

10:30-11:30 **Channel 3**

Refresher Course: Musculoskeletal

RC 810

Update in imaging rheumatology

RC 810-1
Chairperson's introduction
A. Feydy; Paris/FR
(antoine.feydy@cch.aphp.fr)

RC 810-2
How to avoid overdiagnosis of SpA on MRI
A. Feydy; Paris/FR
(antoine.feydy@cch.aphp.fr)

Learning Objectives:
1. To describe the MRI findings of inflammatory diseases of the axial skeleton.
2. To learn about differentials of inflammatory diseases of the axial skeleton.

RC 810-3
New insights and developments in imaging of spondyloarthropathy
W. Rennie; Leicester/UK
(wjrennie@yahoo.com)

Learning Objectives:
1. To describe how to optimise your protocol.
2. To list the potential role of dual-energy CT for the detection of inflammatory diseases in the axial skeleton.
3. To list the potential role of synthetic CT of inflammatory diseases in the axial skeleton.

RC 810-4
Advances in ultrasound of juvenile inflammatory arthropathies
I. Sudol-Szopinska; Warsaw/PL
(sudolszopinska@gmail.com)

Learning Objectives:
1. To explain the role of ultrasound in inflammatory arthropathies in children and adolescents compared to conventional radiography and MRI.
2. To list the ultrasound findings and differentials in inflammatory arthropathies in children and adolescents.

Panel discussion: The role of imaging in the diagnosis and characterisation of rheumatologic diseases

12:30-13:30 **Channel 1**

Round Table Session

RT 9

Building bridges: radiology and radiation therapy, a match made in heaven?

RT 9-1
Chairpersons' introduction
R. G. H. Beets-Tan; Amsterdam/NL
L. E. Derchi; Genoa/IT
(lorenzo.derchi1@gmail.com)

Learning Objectives:
1. To learn about the increasing role of imaging in radiation treatment.
2. To understand how it will impact collaboration in technology innovation.
3. To know how image guidance is used in daily clinical practice of radiation oncology.

RT 9-2
The use of imaging to guide radiation therapy: an interview with the expert (video – no speaker, no live presentation)

RT 9-3
Discussion
V. Valentini; Rome/IT
(vincenzo.valentini@policlinicogemelli.it)
B. Ohnesorge; Erlangen/DE
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
Author Disclosures:
Vincenzo Valentini: Research Grant/Support: MSD, Pfizer, Radius, Varian, Elekta

12:30-13:30 **Channel 2**

Open Forum Session

Organised by the ESR Value-Based Radiology Subcommittee

OF 9c

Value-based radiology: where to next?

OF 9c-1
Chairperson's introduction
A. Brady; Cork/IE
(adrianbrady@me.com)

OF 9c-2
Value-based radiology (VBR): why now?
A. Brady; Cork/IE
(adrianbrady@me.com)

Learning Objectives:
1. To learn the basic concepts of VBR.
2. To appreciate what the ESR has done to date to promote VBR.
3. To understand why VBR is important now and in the future.

OF 9c-3
What constitutes value for patients?
J. Birch; Poole/UK

Learning Objectives:
1. To learn the patient's perspective on what constitutes value in radiology services.
2. To appreciate any differences between the priorities of radiologists and radiographers and patients.
3. To understand the primacy of patient concerns and needs.
Author Disclosures:
Judy Birch: Advisory Board: EAU Chronic Pelvic Pain Guideline Panel; CEO: Pelvic Pain Support Network; Founder: Pelvic Pain Support Network; Grant Recipient: IMI Paincare

OF 9c-4
Focus on value: the way forward
J. J. Visser; Rotterdam/NL
(j.j.visser@erasmusmc.nl)

Learning Objectives:
1. To learn why the assessment of radiology effectiveness must change from a measurement of volume to work done.
2. To appreciate the drivers of such change.
3. To understand what practical steps can be taken to focus on value rather than volume.
Author Disclosures:
Jacob Visser: Consultant: Noaber Foundation, Contextflow, Quibim

Open forum discussion: What practical steps can we take to enhance value in radiology?

12:30-13:30 **Channel 3**

Refresher Course: Chest

RC 904

Artificial intelligence (AI) and technological improvements in chest imaging: the transition from research to practice

RC 904-1
Chairperson's introduction
J. Biederer; Heidelberg/DE
(juergen.biederer@gmx.net)
Author Disclosures:
Jürgen Biederer: Research Grant/Support: Siemens, Bayer; Speaker: Roche, Boehringer Ingelheim

RC 904-2
AI in chronic obstructive pulmonary diseases (COPD)
M. de Bruijne; Rotterdam/NL
(marleen.debruijne@erasmusmc.nl)

Learning Objectives:
1. To learn about AI techniques used to quantify emphysema and airway properties in chest CT.
2. To learn how AI can help in the diagnosis and prognosis of patients with COPD.
3. To understand the current limitations of AI in COPD.
Author Disclosures:
Marleen de Bruijne: Grant Recipient: Quantib, Cosmonio

RC 904-3
AI in interstitial lung diseases
J. Jacob; London/UK
(akelajacob@gmail.com)

Learning Objectives:
1. To understand the processes by which computers learn lung CT patterns.
2. To understand the advantages of computer analysis of CTs over visual CT analysis.
3. To understand the importance of PPFE as a feature in patients with lung fibrosis.
Author Disclosures:
Joseph Jacob: Advisory Board: Boehringer Ingelheim, Roche; Author: Boehringer Ingelheim; Consultant: Boehringer Ingelheim, Roche, GlaxoSmithKline; Grant Recipient: GlaxoSmithKline; Patent Holder: UK patent application number 2113765.8; Speaker: Boehringer Ingelheim, Roche, Takeda

RC 904-4
AI in lung cancer
J. B. Seo; Seoul/KR
(seojb@amc.seoul.kr)

Learning Objectives:
1. To understand the current status of AI applications in lung cancer imaging.
2. To learn how to improve detection of lung nodules in lung cancer CT screening using AI.
3. To learn how to use AI combined with radiomics in the characterisation of lung nodules and lung cancer staging.
Author Disclosures:
Joon Beom Seo: Board Member: Prodmedius; Founder: Premedius; Share holder: Coreline Soft / Promedius

Panel discussion: Clinical applications of AI in thoracic imaging

14:00-15:00 **Channel 1**

Trailer Session

TS 10

High-level sports outpatient clinic: a multidisciplinary approach

TS 10-0
Introduction by the president
R. G. H. Beets-Tan; Amsterdam/NL

TS 10-1
Chairperson's introduction
M. Maas; Amsterdam/NL

Learning Objectives:
1. To become familiar with the needed skills for optimal interaction in high-demand sports.
2. To learn about the needed clinical skills for a team-playing radiologist.
3. To obtain insight in the spectrum of complex sports radiology.
4. To give an outlook to the highlight Multidisciplinary program at ECR 2022.

TS 10-2
The radiologist is my friend: what is the secret? Lessons from the orthopaedic surgeon
G. M. M. J. Kerkhoffs; Amsterdam/NL

TS 10-3
The mélange of hard skills and soft skills in sports radiology
M. Maas; Amsterdam/NL

TS 10-4
Panel discussion: The sports outpatient clinic
G. M. M. J. Kerkhoffs; Amsterdam/NL
M. Maas; Amsterdam/NL

TS 10-5
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

14:00-15:00 **Channel 2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1021

Imaging evaluation of sarcopenia

E³ 1021-1
Multiparametric MRI and CT
I. Rutten; Maastrich/NL
(iris.rutten@mumc.nl)

Learning Objectives:
1. To become familiar with the definition of sarcopenia.
2. To learn about the use of CT and MRI for the assessment of sarcopenia.

E³ 1021-2
Multiparametric US
V. Vasilevska-Nikodinovska; Skopje/MK
(v_vasilevska@yahoo.com)

Learning Objectives:
1. To become familiar with the characteristics of the new modes used to evaluate sarcopenia with multiparametric US.
2. To learn about the applications of multiparametric US for the assessment of sarcopenia.

16:00-17:00 **Channel 1**

HYPMED Session

Organised by the EIBIR

HYPMED 11

Digital hybrid breast PET/MRI for enhanced diagnosis of breast cancer: achievements of the HYPMED Project

HYPMED 11-1
Chairperson's introduction: The HYPMED ambition
C. K. Kuhl; Aachen/DE
(ckuhl@ukaachen.de)

Learning Objectives:
At the end of the session, participants will be able to:
1. Understand the ambition and structure of HYPMED, a Horizon 2020 European collaborative research and innovation project.
2. Explain how the HYPMED PET-RF device improves breast cancer detection and treatment.
3. Describe how the HYPMED PET-RF device will be evaluated for integration in clinical applications.
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 667211.
Author Disclosures:
Christiane K. Kuhl: Advisory Board: Bayer, AstraZeneca

HYPMED 11-2
Introduction of the HYPMED device: a dedicated ultra-low-dose, ultra-high-sensitivity, PET-RF insert for clinical 1.5T MRI with integrated vacuum biopsy capability
V. Schulz; Aachen/DE
(vschulz@ukaachen.de)
Author Disclosures:
Volkmar Schulz: CEO: Hyperion Hybrid Imaging Systems GmbH; Founder: Hyperion Hybrid Imaging Systems GmbH; Research Grant/Support: EU H2020 Hypmed

HYPMED 11-3
Comparative whole-body PET/MR data for future clinical comparison study
T. H. Helbich; Vienna/AT
Author Disclosures:
Thomas H. Helbich: Grant Recipient: EU grant; Research Grant/Support: siemens, bard, bracco, guerbet, novomed

HYPMED 11-4
How to get HYPMED's innovation into the clinic
C. K. Kuhl; Aachen/DE
(ckuhl@ukaachen.de)
Author Disclosures:
Christiane K. Kuhl: Advisory Board: Bayer, AstraZeneca

Panel discussion

16:00-17:00 **Channel 2**

E³ - Advanced Courses: Cancer Imaging

E³ 1118

Paediatric brain tumours: a multidisciplinary approach

E³ 1118-1
Chairperson's introduction
B. Ertl-Wagner; Toronto, ON/CA
(BirgitBetina.Ertl-Wagner@sickkids.ca)

Learning Objectives:
1. To highlight the importance of a multidisciplinary management of paediatric brain tumours.

2. To review the most recent developments in imaging of paediatric brain tumours.
3. To discuss challenging aspects in assessing response to treatment.
4. To give an outlook on the highlight multidisciplinary programme at ECR 2022.
Author Disclosures:
Birgit Ertl-Wagner: Other: Husband employee of Siemens Healthineers

E³ 1118-2
Neurooncology and neuroradiology: why we need each other – the oncologist's perspective
U. Tabori; Toronto, ON/CA
(uri.tabori@sickkids.ca)
Author Disclosures:
Uri Tabori: Grant Recipient: BMS SU@C catalyst grant

E³ 1118-3
Paediatric brain tumours in the molecular age
B. Ertl-Wagner; Toronto, ON/CA
(BirgitBetina.Ertl-Wagner@sickkids.ca)
Author Disclosures:
Birgit Ertl-Wagner: Other: Husband employee of Siemens Healthineers

E³ 1118-4
Challenges with response assessment
Z. Patay; Memphis, TN/US
(zoltan.patay@stjude.org)

E³ 1118-5
Multidisciplinary tumour board: case-based panel discussion
B. Ertl-Wagner; Toronto, ON/CA
(BirgitBetina.Ertl-Wagner@sickkids.ca)
Author Disclosures:
Birgit Ertl-Wagner: Other: Husband employee of Siemens Healthineers

16:00-17:00 **Channel 3**

Refresher Course: Vascular

RC 1115

Vascular imaging techniques: must-haves and new ones on offer

RC 1115-1
Chairperson's introduction
R. Morgan; London/UK
(robert.morgan@stgeorges.nhs.uk)

RC 1115-2
MRI
J. Vogel-Claussen; Hannover/DE
(vogel-claussen.jens@mh-hannover.de)

Learning Objectives:
1. To understand the prerequisites of a state-of-the art MR angiography.
2. To reflect on the unmet clinical needs of the current MRA techniques.
3. To learn about advanced MRA imaging and new developments.

RC 1115-3
CT
J. E. Wildberger; Maastricht/NL
(j.wildberger@mumc.nl)

Learning Objectives:
1. To understand the prerequisites of a state-of-the art CT angiography in terms of contrast delivery and radiation.
2. To reflect on the unmet clinical needs of the current CT techniques.
3. To consider advanced imaging (e.g. CT perfusion, CT FFR) in this respect.
Author Disclosures:
Joachim E. Wildberger: Grant Recipient: Institutional grants via Clinical Trial Center Maastricht: Agfa, Bard, Bayer, Cook, GE, Philips, Optimed, Radiomics, Siemens. all outside the submitted work.; Speaker: via Maastricht UMC+: Bayer, Siemens. …all outside the submitted work.

RC 1115-4
US
Z. Harkanyi; Budapest/HU

Learning Objectives:
1. To provide a brief overview of the conventional US vascular exams (B-mode, power, and colour Doppler) and recent development of microvascular imaging.
2. To demonstrate the current applications of contrast-enhanced ultrasound (CEUS) in peripheral and abdominal vessels.
3. To summarise the strength and limitations of the existing vascular ultrasound techniques in adult and paediatric patients.

RC 1115-5
Angiography
A. H. Mahnken; Marburg/DE
(andreas.mahnken@staff.uni-marburg.de)

Learning Objectives:
1. To learn about recent trends in diagnostic CCA in the age of CTA and MRA.
2. To learn about new technological developments in CCA.
3. To implement new CCA techniques into clinical routine.

Panel discussion: Something for next Black Friday?

Friday, March 4

08:00-09:00 **Channel 2**

Refresher Course: Genitourinary

RC 1207
Imaging of benign female pelvis

RC 1207-1
Chairperson's introduction
D. Akata; Ankara/TR
(dakata@hacettepe.edu.tr)

RC 1207-2
Imaging of endometriosis: ultrasonography and/or pelvic MRI
I. Thomassin-Naggara; Paris/FR
(isabelle.thomassin@tnn.aphp.fr)

Learning Objectives:
1. To learn the value of different imaging modalities for diagnosis and pre-operative assessment.
2. To learn the different locations of endometriosis (adnexal, posterior, lateral, and anterior) and their significance in imaging.
3. To understand the key elements for US and MRI reporting.
Author Disclosures:
Isabelle Thomassin-Naggara: Advisory Board: Bracco, guerbet; Speaker: Ge, canon, hologic, guerbet, icad

RC 1207-3
Myometrial masses
S. Swift; Leeds/UK
(sarah.swift1@nhs.net)

Learning Objectives:
1. To learn the strengths and weaknesses of different imaging modalities for assessing benign myometrial masses.
2. To appreciate the wide variation in appearances of uterine leiomyomata and adenomyosis.
3. To recognise complications that may occur and cause diagnostic challenges.

RC 1207-4
Congenital anomalies
C. Maciel; Porto/PT
(tina_maciel@yahoo.com)

Learning Objectives:
1. To become familiar with how to apply proper patient preparation and dedicated MRI protocol.
2. To identify and categorise the main congenital anomalies of the female genital tract based on the ESRHE/ESGE classification system.
3. To appreciate the value of MRI in treatment planning and the evaluation of post-treatment complications.

Panel discussion: Is there a need for routine MRI for all patients?

08:00-09:00 **Channel 3**

Refresher Course: Head and Neck

RC 1208
Differential diagnosis in head and neck imaging: how I do it

RC 1208-1
Chairperson's introduction
C. Czerny; Vienna/AT
(christian.czerny@meduniwien.ac.at)

RC 1208-2
How I approach the thyroid nodule
S. LaPorte; Milton Keynes/UK

Learning Objectives:
1. To apply a grading system for classifying thyroid nodules.
2. To advise clinicians on when and how to investigate and follow-up thyroid nodules.
3. To recognise challenging cases and know how to manage them.

RC 1208-3
How I approach the opacified middle ear
B. De Foer; Antwerp/BE
(bert.defoer@gza.be)

Learning Objectives:
1. To understand the clinical presentation of the most common inflammatory and non-inflammatory disorders of the middle ear.
2. To learn which imaging techniques help in the differentiation of middle ear opacification.
3. To describe the imaging features of the most common disorders causing middle ear opacification.

RC 1208-4
How I approach the opacified paranasal sinus
H. B. Eggesbø; Oslo/NO
(h.b.eggesbo@medisin.uio.no)

Learning Objectives:
1. To identify dental infection as a common cause of ipsilateral sinusitis.
2. To recognise the specific features of non-invasive and invasive fungal sinusitis.
3. To identify the characteristics of malignant sinonasal disease.

Panel discussion: Common head and neck-related imaging findings: what do I put in the conclusion of my report?

10:30-11:30 **Channel 1**

Round Table Session

RT 13
Building bridges: how to be successful in multidisciplinary research?

RT 13-1
Chairpersons' introduction
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)

Learning Objectives:
1. To understand the importance of teaming up with other medical professionals to achieve successful research that will have impact on patient outcome.
2. To learn how to start a clinically oriented research project involving multiple disciplines.
3. To understand the importance of involving the different stakeholders during each stage of the project.
4. To know which skills are required to successfully run a multidisciplinary research.
5. To learn the important role of radiologists in the design and execution of clinical trials.

RT 13-2
How do I start and successfully run a multidisciplinary clinical research
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

RT 13-3
Clinical trials in radiology and data sharing: results from a survey of the European Society of Radiology (ESR) research committee
M. Dewey; Berlin/DE
(marc.dewey@charite.de)
Author Disclosures:
Marc Dewey: Grant Recipient: EU (603266-2) DFG (DE 1361/14-1, DE 1361/18-1, BIOQIC GRK 2260/1, Radiomics DE 1361/19-1 [428222922] and 20-1 [428223139] in SPP 2177/1), Berlin University Alliance (GC_SC_PC 27), Berlin Institute of Health (Digital Health Accelerator); Patent Holder: Patent on fractal analysis of perfusion imaging (jointly with Florian Michallek,

PCT/EP2016/071551 and USPTO 2021 10,991,109 approved); Other: Editor: Cardiac CT (Springer Nature). Hands-on cardiac CT courses (www.ct-kurs.de). Institutional research agreements: Siemens, General Electric, Philips, Canon.European Society of Radiology (ESR) Research Chair (2019–2022) and ESR Publications Chair (2022-2025).

RT 13-4
Discussion
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)
C. Catalano; Rome/IT
(Carlo.Catalano@uniroma1.it)
M. Dewey; Berlin/DE
(marc.dewey@charite.de)
A. Spinazzi; Monroe Township, NJ/US
Author Disclosures:
Luis Martí-Bonmatí: Board Member: Quibim SL; Grant Recipient: Several Horizon 2020 projects
Alberto Spinazzi: Employee: Bracco Imaging

10:30-11:30 **Channel 2**

New Horizons Session

NH 13
Imaging to guide surgical approach: what do radiologists need to know?

NH 13-1
Chairperson's introduction
L. K. Blomqvist; Stockholm/SE
(lennart.k.blomqvist@ki.se)
Author Disclosures:
Lennart K. Blomqvist: Consultant: CMO and cofounder Collective Minds Radiology; Founder: Collective Minds Radiology www.cmrad.com; Owner: Co-owner of Collective Minds Radiology www.cmrad.com; Share holder: Collective Minds Radiology

NH 13-2
Imaging to guide upper GI surgery: questions from the surgeon and contribution of the radiologist
A. M. Riddell; London/UK

Learning Objectives:
1. To understand the contribution of endoluminal and conventional imaging in patient selection for surgery.
2. To understand the added value of functional imaging and other novel imaging techniques in patient selection for surgery.
3. To understand how tumour location helps determine the surgical approach.

NH 13-3
Imaging to guide lower GI surgery: questions from the surgeon and contribution of the radiologist
I. Santiago; Lisbon/PT

Learning Objectives:
1. To introduce the relevant anatomy and anatomic variants for rectal cancer surgery.
2. To discuss the role of MR imaging and EUS for the selection of early rectal cancer patients for local excision (+/-neoadjuvant therapy) versus total mesorectal excision (TME).
3. To address the key imaging features for the selection of rectal cancer patients for neoadjuvant therapy versus upfront surgery.
4. To elaborate on how response assessment after neoadjuvant therapy may shift patients towards less mutilating surgery or organ preservation strategies.

NH 13-4
Imaging to guide liver surgery: questions from the surgeon and contribution of the radiologist
E. Jonas; Cape Town/ZA
(eduard.jonas@uct.ac.za)

Learning Objectives:
1. To discuss the importance of characterisation and detection in the context of modern liver surgery.
2. To introduce the functional segmental anatomy of the liver with an emphasis on surgically relevant variations of segmental anatomy, blood supply, drainage, and biliary anatomy.
3. To address the role of imaging-based liver function assessment in liver surgery.
4. To elaborate on the role of imaging-based treatment response assessment in the multimodality management of liver tumours.

Panel discussion: What is needed in the workflow to ensure that imaging information provides accurate surgical guidance?

10:30-11:30 **Channel 3**

Refresher Course: Chest

RC 1304
Thoracic manifestations of COVID-19 pneumonia in 2022: new insights

RC 1304-1
Chairperson's introduction
J. Biederer; Heidelberg/DE
(juergen.biederer@gmx.net)
Author Disclosures:
Jürgen Biederer: Research Grant/Support: Siemens, Bayer; Speaker: Roche, Boehringer Ingelheim

RC 1304-2
What's the current role of imaging?
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)

Learning Objectives:
1. To recognise CT features highly suggestive of COVID-19 pneumonia and to learn how to score disease extent.
2. To understand how to appropriately use imaging to diagnose vascular complications.
3. To learn how to distinguish potentially reversible anomalies for irreversible changes on CT.
Author Disclosures:
Marie-Pierre Revel: Consultant: GE Healthcare; Investigator: GE Healthcare; Research Grant/Support: GE Healthcare

RC 1304-3
Imaging modalities: pros and cons
J. Kanne; Madison, WI/US
(jkanne@gmail.com)

Learning Objectives:
1. To define the value of different chest imaging modalities for patients with COVID-19 pneumonia.
2. To identify the limitations in the diagnosis and management of COVID-19 pneumonia.
3. To describe the potential roles of imaging in COVID-19 pneumonia in the context of local transmission, variants of concern, and vaccination levels.
Author Disclosures:
Jeffrey Kanne: Consultant: Calyx.ai, Delfi Diagnostics, Bayer Medical

RC 1304-4
Long-term sequelae
K. Martini; Zurich/CH

Learning Objectives:
1. To identify and name the typical pulmonary changes encountered in the follow-up of COVID-19 patients.
2. To understand the differences of fibrotic lung changes and prior organising pneumonia after COVID-19 pneumonia.
3. To know which imaging modalities and protocols are appropriate and at which disease stage.

Panel discussion: When and how to image COVID pneumonia

12:30-13:30 **Channel 1**

Trailer Session

TS 14

Open forum for Young ECR

Part 1: Meet the professors

TS 14-1
Chairperson's introduction
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
This trailer session will give an outlook to one of the highlights of the Open Forum program at ECR 2022 July. The Young ECR 2022 Open Forum program is dedicated to young radiologists and young clinicians, as part of the ECR 2022 theme Building bridges. In this trailer session distinguished professors of radiology will share their experience, their vision, and give advice and guidance to the younger generation of radiologists.
Young members of subspecialty societies in radiology and other medical disciplines will discuss the role of radiologists from the multidisciplinary view of the young generation.

TS 14-2
Mentoring in radiology: why and how
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

TS 14-3
Discussion
R. G. H. Beets-Tan; Amsterdam/NL
C. Catalano; Rome/IT
(Carlo.Catalano@uniroma1.it)
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)
D. M. Lambregts; Amsterdam/NL
H. Heinrich; Zurich/CH
(henriette.heinrich@usz.ch)

Part 2: My involvement in a subspecialty committee: a multidisciplinary perspective

TS 14-4
Chairperson's introduction
R. G. H. Beets-Tan; Amsterdam/NL

TS 14-5
Young ESGAR
D. M. Lambregts; Amsterdam/NL

TS 14-6
Young UEG
H. Heinrich; Zurich/CH
(henriette.heinrich@usz.ch)

Discussion

TS 14-7
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

12:30-13:30 **Channel 2**

Refresher Course: Hybrid, Molecular and Translational Imaging

RC 1406

Introduction to functional and molecular imaging and applications in oncology

RC 1406-1
Chairperson's introduction
M. Eisenblätter; Freiburg/DE
(michel.eisenblaetter@uniklinik-freiburg.de)

RC 1406-2
Perfusion CT (pCT)
C. A. Cuénod; Paris/FR
(ca@cuenod.net)

Learning Objectives:
1. To understand the fundamental processes and technical aspects of pCT.
2. To learn about the current clinical applications of pCT in oncology.
3. To discuss the potential new applications for pCT.

RC 1406-3
Diffusion and perfusion-weighted MRI
A. E. Hansen; Copenhagen/DK
(adam.espe.hansen@regionh.dk)

Learning Objectives:
1. To understand the biophysical basis of diffusion- and perfusion-weighted MRI.
2. To understand the applications of diffusion- and perfusion-weighted MRI at various stages during cancer treatment.
3. To understand the radiological use of diffusion- and perfusion-weighted MRI.

RC 1406-4
Update on radionuclide theranostics
L. Aloj; Cambridge/UK

Learning Objectives:
1. To identify the indications and cancers where radionuclide theranostics are approved for clinical use.
2. To list the strategies and conditions where there is likely to be clinical approval in the coming years.
3. To describe and reflect on the challenges and potential of the future development of radionuclide theranostics and the translational approaches currently being explored.
Author Disclosures:
Luigi Aloj: Investigator: Novartis; Speaker: Novartis, Sirtex

Panel discussion: How to choose the correct modality for the functional imaging of cancer

12:30-13:30 **Channel 3**

Refresher Course: Paediatric

RC 1412

GI and GU imaging in children

RC 1412-1
Chairperson's introduction
L.-S. Ording Müller; Oslo/NO
(lilsofie.ording@googlemail.com)

RC 1412-3
Unknown sex of a new-born: imaging pearls and pitfalls
M. Alison; Paris/FR
(marianne.alison@aphp.fr)

Learning Objectives:
1. To understand the role of imaging in a child with a disorder of sexual development.

2. To learn about the imaging appearances of disorders of sexual development in children.
3. To discuss the common pitfalls and how to avoid them.

RC 1412-4
Multisystem inflammatory syndrome in children (MIS-C)
T. Watson; London/UK

Learning Objectives:
1. To understand what is meant by MIS-C.
2. To learn about the role of various imaging modalities in diagnosing MIS-C.
3. To discuss the common pitfalls and how to avoid them.
Author Disclosures:
Tom Watson: Consultant: Alimentiv - paid central reader

Panel discussion: When to proceed from ultrasound to cross sectional imaging?

14:00-15:00 **Channel 1**

Trailer Session

TS 15
Hepatocellular carcinoma: a multidisciplinary approach in real life

TS 15-1
Chairperson's introduction
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

Learning Objectives:
1. To review the diagnostic imaging findings of hepatocellular carcinoma.
2. To review the management of patients with suspected or confirmed hepatocellular carcinoma.
3. To integrate the pros and cons of different management approaches for hepatocellular carcinoma.
4. To give an outlook to the highlight Multidisciplinary program at ECR 2022.

TS 15-2
Diagnosis and follow-up of hepatocellular carcinoma
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

Learning Objectives:
1. To learn about the common features of typical hepatocellular carcinoma (HCC) as detailed in the guidelines.
2. To discuss the role of liver biopsy in the diagnosis of HCC.
3. To become familiar with the patient management of atypical lesions in chronic liver diseases.

TS 15-3
Treatment algorithms in hepatocellular carcinoma: the oncohepatologist's view
M. Bouattour; Clichy/FR
(mohamed.bouattour@aphp.fr)

Learning Objectives:
1. To link staging in hepatocellular carcinoma (HCC) to treatment.
2. To obtain an overview on new systemic treatment options.
3. To discuss the role of systemic therapy in early and intermediate staged HCC.
Author Disclosures:
Mohamed Bouattour: Advisory Board: Bayer, IPSEN, Roche, Astra-Zeneca, BMS, MSD, Sirtex medical; Consultant: Bayer, IPSEN, Roche, Astra-Zeneca, BMS, MSD, Sirtex medical; Investigator: Bayer, IPSEN, Roche, Astra-Zeneca, BMS, MSD, Sirtex medical

TS 15-4
Multidisciplinary tumour board: case-based panel discussion
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

TS 15-5
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

14:00-15:00 **Channel 2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1521b
Imaging of the face

E³ 1521b-1
Facial infections and complications
M. G. Mack; Munich/DE
(m.mack@radiologie-muenchen.de)

Learning Objectives:
1. To become familiar with the key concepts and imaging features of facial infections.
2. To learn how to integrate clinical findings with radiological features.

E³ 1521b-2
Facial pain
A. Borges; Lisbon/PT
(borgalexandra@gmail.com)

Learning Objectives:
1. To become familiar with the key concepts and imaging features of facial pain.
2. To learn how to integrate clinical findings with radiological features.

14:00-15:00 **Channel 3**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESR

BS 15
Neuroradiology

Moderator
A. Krainik; Grenoble/FR

BS 15-2
Imaging dementia and neurodegenerative disease
C. Calli; Izmir/TR
(cem.calli@gmail.com)

Learning Objectives:
1. To learn about imaging features in dementia and other neurodegeneration.
2. To demonstrate the most important imaging findings.
Author Disclosures:
Cem Calli: Board Member: ESNR

BS 15-3
Imaging posterior fossa malformations
M. A. Lucic; Sremska Kamenica/RS
(milos.a.lucic@gmail.com)

Learning Objectives:
1. To learn about imaging features in posterior fossa malformations.
2. To demonstrate the most important findings.

BS 15-4
Imaging the sellar region
L. van den Hauwe; Antwerp/BE
(lucvdhauwe@mac.com)

Learning Objectives:
1. To learn about imaging features in sellar region pathologies.
2. To demonstrate the most important findings.

16:00-17:00 **Channel 1**

Round Table Session

RT 16
Building bridges: integrated diagnostics

RT 16-1
Chairpersons' introduction
R. G. H. Beets-Tan; Amsterdam/NL
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)

Learning Objectives:
1. To learn about the concept of integrated diagnostics for better treatment decision-making process.
2. To understand the value of emerging fluid biomarkers in oncology.
3. To know how digitalisation can enhance the development and implementation of AI powered prediction models.

RT 16-2
The importance of integrating imaging biomarkers for cancer treatment guidance
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)
Author Disclosures:
Luis Martí-Bonmatí: Advisory Board: Quibim SL; Grant Recipient: Several Horizon 2020 projects

RT 16-3
Emerging fluid biomarkers in oncology
D. van den Broek; Amsterdam/NL
(da.vd.broek@nki.nl)
Author Disclosures:
Daan van den Broek: Advisory Board: Roche diagnostics; Grant Recipient: Roche diagnostics

RT 16-4
Integrated diagnosis: perspectives from the industry
T. Schinecker; Basle/CH
Author Disclosures:
Thomas Schinecker: CEO: Roche Diagnostics

RT 16-5
Discussion
T. Schinecker; Basle/CH
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)
D. van den Broek; Amsterdam/NL
A. Brady; Cork/IE
(adrianbrady@me.com)
Author Disclosures:
Luis Martí-Bonmatí: Board Member: Quibim SL; Grant Recipient: Several Horizon 2020 projects

16:00-17:00 **Channel 2**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESR

BS 16
Vascular

Moderator
V. E. Sinitsyn; Moscow/RU
Author Disclosures:
Valentin E. Sinitsyn: Speaker: Bayer, GE, Siemens, Philips, Canon

BS 16-2
Imaging the aorta
T. Leiner; Utrecht/NL

Learning Objectives:
1. To present the current imaging techniques to evaluate the aorta.
2. To demonstrate the most important imaging findings.
Author Disclosures:
Tim Leiner: Research Grant/Support: Netherlands Organization for Scientific Research; Philips Healthcare; Speaker: Philips Healthcare

BS 16-3
Imaging the upper and lower limb: arterial
C. Loewe; Vienna/AT
(christian.loewe@meduniwien.ac.at)

Learning Objectives:
1. To present the current imaging techniques to evaluate the upper and lower limb arteries.
2. To demonstrate the most important findings.
Author Disclosures:
Christian Loewe: Speaker: GE HEalthcare; Siemens Healthineers

BS 16-4
Imaging the lower limb: venous
M. Francone; Milan/IT
(marco.francone@hunimed.eu)

Learning Objectives:
1. To present the current imaging techniques to evaluate the lower limb veins.
2. To demonstrate the most important findings.

16:00-17:00 **Channel 3**

Refresher Course: Abdominal Viscera

RC 1601
Artificial intelligence (AI) in abdominal radiology

RC 1601-1
Chairperson's introduction
L. Curvo-Semedo; Coimbra/PT
(curvosemedo@gmail.com)

RC 1601-2
AI-radiologist at the forefront of innovation in medicine
F. Sardanelli; San Donato Milanese/IT

Learning Objectives:
1. To become familiar with the basic concept of artificial intelligence.
2. To learn why this will lead to a paradigm shift in medicine.
3. To understand why radiologists will be at the center of this paradigm shift.
Author Disclosures:
Francesco Sardanelli: Advisory Board: Bayer, Bracco, DeepTrace Technologies, General Electric; Equipment Support Recipients: General Electric; Research Grant/Support: Bayer, Bracco, General Electric; Speaker: Bayer, General Electric

RC 1601-3
Implementation and design of artificial intelligence in abdominal imaging
N. Papanikolaou; Lisbon/PT
(nickolas.papanikolaou@research.fchampalimaud.org)

Learning Objectives:
1. To understand why you should implement AI in abdominal imaging.
2. To learn how to implement AI in abdominal imaging.
Author Disclosures:
Nickolas Papanikolaou: Owner: MRIcons LTD

RC 1601-4
AI for abdominal radiologists in routine practice: clinical use cases
J. J. M. van Griethuysen; Amsterdam/NL
(j.v.griethuysen@nki.nl)

Learning Objectives:
1. To learn how to work as a radiologist with AI in abdominal imaging.
2. To become familiar with current AI solutions in abdominal imaging.

Panel discussion: How to implement AI into today's daily clinical routine?

Saturday, March 5

08:00-09:00 **Channel 2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1721

Gynaecological cancer imaging

E³ 1721-1
Cervical cancer
T. M. Cunha; Lisbon/PT

Learning Objectives:
1. To describe the imaging findings of cervical cancer.
2. To learn about the new International Federation of Gynecology and Obstetrics (FIGO) classification and ist implications.
3. To define the role of radiologic examinations and review the ideal imaging protocols.
4. To recognise imaging pitfalls in cervical cancer.

E³ 1721-2
Ovarian cancer: new challenges
R. Manfredi; Rome/IT
(riccardo.manfredi@unicatt.it)

Learning Objectives:
1. To be familiar with the histological subtype of the epithelial ovarian cancer.
2. To become familiar with the revised FIGO staging system.
3. To learn about the role of imaging in recognising "difficult to resect" disease.
Author Disclosures:
Riccardo Manfredi: Speaker: Bracco, Schering

08:00-09:00 **Channel 3**

Refresher Course: Head and Neck

RC 1708

Advances in petrous bone imaging: how I do it

RC 1708-1
Chairperson's introduction
S. Connor; London/UK
(sejconnor@gmail.com)
Author Disclosures:
Stephen Connor: Research Grant/Support: Kodak Radiology Fund Scholarship 2019: Imaging endolymphatic hydrops at 7T MRI

RC 1708-2
Contemporary imaging of auditory implants
B. M. Verbist; Leiden/NL

Learning Objectives:
1. To demonstrate the current implants for hearing rehabilitation.
2. To describe the imaging appearance of these otological implants.
3. To demonstrate the key imaging features when reporting post implantation.
Author Disclosures:
Berit M. Verbist: Grant Recipient: to institution; Oticon, Advanced Bionics

RC 1708-3
Can MRI diagnose Meniere's disease and can it be clinically useful?
A. Bernaerts; Antwerp/BE
(Anja.Bernaerts@gza.be)

Learning Objectives:
1. To detect and grade endolymphatic hydrops and perilymphatic enhancement.
2. To identify anatomical pitfalls in hydrops imaging.
3. To discuss secondary hydrops.

RC 1708-4
Contemporary imaging of sudden sensorineural hearing loss and new concepts in imaging pulsatile tinnitus?
G. Conte; Milan/IT
(giorgioconte.unimed@gmail.com)

Learning Objectives:
1. To define an optimised MRI scan protocol for assessing sudden sensorineural hearing loss.
2. To describe intra-labyrinthine pathological changes in sudden sensorineural hearing loss using a pattern-based approach.
3. To combine clinical information and imaging findings for identifying the site of origin of pulsatile tinnitus.

Panel discussion: Do new otological imaging applications benefit patient management?

10:30-11:00 **Channel 1**

Round Table Session

Organised by the ESR PAG

RT 18

Be accepted project

RT 18-1
Chairpersons' introduction
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)

RT 18-2
An introduction to Be accepted

RT 18-3
Perfecting the doctor-patient relationship: the value of Be accepted to the radiologist
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)

RT 18-4
Be accepted: a practical guide for the patient journey
C. Justich; Vienna/AT
(cjustich@me.com)
Author Disclosures:
Caroline Justich: Founder: Beaccepted

RT 18-5
Discussion

10:30-11:30 **Channel 2**

Special Focus Session

SF 18

Emerging MRI for the clinic

SF 18-1
Chairperson's introduction
K. Nikolaou; Tübingen/DE
(Konstantin.Nikolaou@med.uni-tuebingen.de)
Author Disclosures:
Konstantin Nikolaou: Grant Recipient: Siemens Healthineers, Bayer Healthcare; Speaker: Siemens Healthineers, Bayer Healthcare

SF 18-2
Novel MRI hardware and its clinical potential
M. Zaitsev; Freiburg/DE

Learning Objectives:
1. To name and recognise the primary hardware parameters of MRI systems.
2. To identify the relationship between the imaging performance of MRI and the nominal system specifications.

3. To appreciate and judge the capability of MRI hardware advances in addressing current and future clinical challenges.

SF 18-3
The (r)evolution of undersampling techniques
A. Webb; Leiden/NL
(a.webb@lumc.nl)

Learning Objectives:
1. To learn about the principle of understanding in image acquisition.
2. To describe the pros and cons of parallel imaging.
3. To relate the concept of compressed sensing to more rapid imaging.

SF 18-4
Pros and cons of MRI at high-field
M. Tosetti; Pisa/IT

Learning Objectives:
1. To understand the effects of the magnetic field on MRI parameters.
2. To name the pulse sequences that have the greatest benefits at ultra-high field strengths.
3. To identify the main artefacts that occur at ultra-high field.

Panel discussion: Promises and pitfalls of emerging MRI

10:30-11:30 **Channel 3**

State of the Art Symposium

SA 18
Acute stroke in the emergency department

SA 18-1
Chairperson's introduction
M. Muto; Naples/IT
(mutomar2@gmail.com)

SA 18-2
Acute stroke: MRI first?
C. Oppenheim; Paris/FR

Learning Objectives:
1. To understand the clinical and basic imaging criteria when selecting stroke patients.
2. To analyse the update guidelines in stroke treatment and the role of CT in the Hub and Spoke centre.
3. To describe how CTA and CT-perfusion can select patients.
4. To identify when it is mandatory to perform MRI examinations.

SA 18-3
Strategies to reduce door-to-needle time: the clinician's point of view
E. Carrera; Geneva/CH

Learning Objectives:
1. To clarify how to organise the pre-hospital setting.
2. To describe the best intra-hospital setting.
3. To discuss going directly to the angio suite: is it realistic?

Panel discussion: What radiologists need to know about the clinician's expectations from radiology in acute stroke?

12:30-13:30 **Channel 1**

Round Table Session

RT 19
Building bridges: opportunities for multidisciplinary training

RT 19-1
Chairpersons' introduction
C. Catalano; Rome/IT
(Carlo.Catalano@uniroma1.it)
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To understand the new role radiologist and how this may impact training programmes for the new generation radiologists and interventional radiologists.
2. To learn about the ESR survey results and how taking a more clinical role will impact radiologists' training programmes.
3. To learn about opportunities for multidisciplinary training.
4. To discuss whether and how the implementation of AI in radiology will impact radiologists' training programmes.

RT 19-2
The new role of the radiologist: how will it impact training programmes?
A. G. Rockall; London/UK
(a.rockall@imperial.ac.uk)

RT 19-3
AI in radiology: how will it impact training programmes?
A. Brady; Cork/IE
(adrianbrady@me.com)

RT 19-4
Discussion
A. G. Rockall; London/UK
(a.rockall@imperial.ac.uk)
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)
A. Brady; Cork/IE
(adrianbrady@me.com)
L. E. Derchi; Genoa/IT
(lorenzo.derchi1@gmail.com)

12:30-13:30 **Channel 2**

Refresher Course: Breast

RC 1902
Artificial intelligence (AI) in breast imaging

RC 1902-1
Chairperson's introduction
F. J. Gilbert; Cambridge/UK
(fjg28@cam.ac.uk)
Author Disclosures:
Fiona J. Gilbert: Consultant: Google, Kheiron; Research Grant/Support: GE Healthcare, Bayer, Hologic; Speaker: GE Healthcare

RC 1902-2
What are the current clinical challenges in breast imaging?
P. Clauser; Vienna/AT
(clauser.p@hotmail.it)

Learning Objectives:
1. To review the areas of application of AI in breast imaging including image processing, image interpretation, and aid in clinical decision making.
2. To discuss the clinical needs for which AI could be implemented, such as examination time, image evaluation in screening, and personalised medicine.
3. To become familiar with the main factors (technical, organisational, and legal) limiting the development and introduction of AI into clinical practice.
Author Disclosures:
Paola Clauser: Board Member: EUSOBI; Speaker: Siemens Healthineers

RC 1902-3
Specific current clinical AI applications in screening
C. Lehman; Boston, MA/US
(clehman@partners.org)

Learning Objectives:
1. To summarise the specific case uses of AI in clinical screening mammography programs.
2. To describe the opportunities and challenges in the implementation of AI into clinical practice.
Author Disclosures:
Constance Lehman: Founder: Clairity, Inc.; Grant Recipient: Breast Cancer Research Foundation; Research Grant/Support: Institutional support from GE Healthcare and Hologic

RC 1902-4
Specific current clinical AI applications in the assessment setting
K. Pinker-Domenig; New York, NY/US
(pinkerdk@mskcc.org)

Learning Objectives:
1. To understand the application of AI to different breast imaging modalities, including mammography, ultrasound, and magnetic resonance imaging, in different clinical scenarios.
2. To identify the clinical value of AI-enhanced breast imaging in the assessment setting.
3. To realise the challenges and current limitations of AI-enhanced breast imaging techniques in the diagnostic setting.

Author Disclosures:
Katja Pinker-Domenig: Board Member: EUSOBI; Consultant: Genentech Inc. 05/19- present, Merantix Healthcare 05/20- present, AURA Health Technologies GmbH 04/21- present; Research Grant/Support: * Digital Hybrid Breast PET/MRI for Enhanced Diagnosis of Breast Cancer (HYPMED) H2020 - Research and Innovation Framework Programme PHC-11-2015 # 667211-2 * A Body Scan for Cancer Detection using Quantum Technology (CANCERSCAN) H2020-FETOPEN-2018-2019-2020-01 # 828978 * Multiparametric 18F-Fluoroestradiol PET/MRI coupled with Radiomics Analysis and Machine Learning for Prediction and Assessment of Response to Neoadjuvant Endocrine Therapy in Patients with Hormone Receptor+/HER2– Invasive Breast Cancer Jubiläumsfonds of the Austrian National Bank # Nr: 18207 * Deciphering breast cancer heterogeneity and tackling the hypoxic tumor microenvironment challenge with PET/MRI, MSI and radiomics The Vienna Science and Technology Fund LS19-046 * MSKCC 2020 Molecularly Targeted Intra-Operative Imaging Award 07/2020-06/2021 * Breast Cancer Research Foundation 06/2019 - 05/2021 * NIH R01 Breast Cancer Intravoxel-Incoherent-Motion MRI Multisite (BRIMM) 09/01/2020-08/30/2025 * NIH R01 subaward: Abbreviated Non-Contrast-Enhanced MRI for Breast Cancer Screening 09/01/2023-08/31/2025 Katja Pinker is supported in part through the NIH/NCI Cancer Center Support Grant P30 CA008748 and a grant from the Breast Cancer Research Foundation.; Speaker: Speakers bureaus: - European Society of Breast Imaging (active) - Siemens Healthineers (ended) - IDKD 2019 (ended)

Panel discussion: Translational challenges using AI in clinical breast imaging

12:30-13:30 **Channel 3**

Refresher Course: Oncologic Imaging

RC 1916
Imaging beyond the tumour in oncology patients

RC 1916-1
Chairperson's introduction
L. S. Fournier; Paris/FR
Author Disclosures:
Laure S. Fournier: Grant Recipient: Bristol-Myers-Squibb; Research Grant/Support: Philips, Ariana Pharma, Evolucare; Speaker: General Electric Helathcare, Median Technologies

RC 1916-2
Sarcopenia in cancer patients
T. Leiner; Utrecht/NL

Learning Objectives:
1. To review the definition and pathophysiology of sarcopenia.
2. To understand how different imaging modalities can be used to identify sarcopenia.
3. To describe the prognostic value of imaging markers of sarcopenia in cancer patients.

Author Disclosures:
Tim Leiner: Research Grant/Support: Netherlands Organization for Scientific Research; Philips Healthcare; Speaker: Philips Healthcare

RC 1916-3
Cardiovascular disease and cancer
E. Mousseaux; Paris/FR
(elie.mousseaux@egp.ap-hop-paris.fr)

Learning Objectives:
1. To describe the main cardio-toxic effects of chemotherapy and radiotherapy.
2. To understand the interactions of cancer treatment with cardiovascular disease.
3. To understand the possible preventions that are proposed for populations at high cardiovascular risk or at risk of cardiotoxicity.

RC 1916-4
Treatment complications: the example of immunotherapy
N. Tunariu; London/UK
(nina.tunariu@icr.ac.uk)

Learning Objectives:
1. To become familiar with the concepts behind immunotherapy.
2. To identify imaging patterns of immunotherapy-related complications.
3. To become aware of the challenges posed by the patterns of progression encountered with immunotherapy.

Panel discussion: Which is the role of the radiologist in definite factors that impact cancer patient management?

14:00-15:00 **Channel 2**

E³ - European Diploma Prep Sessions

E³ 2023
Head and neck

E³ 2023-1
Chairperson's introduction
M. G. Mack; Munich/DE
(m.mack@radiologie-muenchen.de)

Learning Objectives:
To become familiar with the anatomy and imaging presentation of the most common disorders of the temporal bone and skull base. To understand the imaging presentation of common inflammatory and neoplastic disorders of the nose, paranasal sinuses, and nasopharynx. To describe the typical imaging features of the most common neoplastic disorders of the oral cavity, oropharynx, hypopharynx, and larynx.

E³ 2023-2
Temporal bone and skull base
A. Tartaro; Chieti/IT
(armando.tartaro@unich.it)

Learning Objectives:
1. To differentiate between the anatomy, normal variants, and congenital disorders of the temporal bone.
2. To understand the causes and imaging features of hearing and vestibular disorders.
3. To describe the imaging presentation of the most common tumours of the skull base.

E³ 2023-3
Nose, paranasal sinuses, and nasopharynx
T. Das; Cambridge/UK
(tilak.das@addenbrookes.nhs.uk)

Learning Objectives:
1. To describe the anatomy and normal variants of the nose, paranasal sinuses, and nasopharynx.
2. To differentiate between the imaging features of acute and chronic inflammatory changes of the nose and paranasal sinuses.
3. To understand the imaging features of benign and malignant tumours of the nose, paranasal sinuses, and nasopharynx.

E³ 2023-4
Oral cavity, oropharynx, hypopharynx and larynx
M. Becker; Geneva/CH

Learning Objectives:
1. To describe the normal imaging anatomy of the oral cavity, oropharynx, hypopharynx, and larynx.
2. To understand the imaging features of tumours of the oral cavity and oropharynx.
3. To understand the imaging features of tumours of the hypopharynx and larynx.

14:00-15:00 **Channel 3**

Refresher Course: Emergency Imaging

RC 2017

Abdominal emergencies after abdominal surgery

RC 2017-1
Chairperson's introduction
A. Blanco Barrio; Murcia/ES
(anablancowhite@gmail.com)

RC 2017-2
Bowel surgery: a puzzle for emergency radiologist
L. Curvo-Semedo; Coimbra/PT
(curvosemedo@gmail.com)

Learning Objectives:
1. To learn about the surgical techniques for abdominal approach (laparoscopy, laparotomy, focal incision).
2. To understand the main surgical strategies and anastomosis for oncologic or bariatric surgery.
3. To recognise the different surgical procedures via imaging.

RC 2017-3
Emergencies after abdominal organ transplantation
T. Syversveen; Oslo/NO

Learning Objectives:
1. To learn about the most common abdominal emergencies related to abdominal organ transplantation.
2. To recognise the imaging signs.
3. To learn about the patient management implications.

RC 2017-4
How to manage post-operative bleeding or ischaemia and abdominal collections
P. Calame; Besançon/FR
(calame.paul@gmail.com)

Learning Objectives:
1. To learn about adequate CT protocols to investigate patients with a suspicion of intra-abdominal bleeding or abdominal collections.
2. To identify the relevant CT findings for management decision-making.
3. To describe the role of interventional radiology when there is intra-abdominal active bleeding or abdominal collection.

Panel discussion: Which imaging findings suggest an operative treatment?

16:00-17:00 **Channel 1**

Trailer Session

Jointly organised by the ESR PAG and EFRS

TS 21

Radiologists and radiographers: communicating with patients

Part 1: The radiologist-patient relationship

Moderators
R. G. H. Beets-Tan; Amsterdam/NL
M. H. Fuchsjäger; Graz/AT

Learning Objectives:
This trailer session will give an outlook to the highlights of the 'Patient in Focus' program and the Radiographers program at ECR 2022, July 13-17.
True patient-centred approaches can have a significant impact on patient outcome and experience. It is important to understand the patient's needs and how we should communicate. This session strives to enhance the knowledge, skills, and competence in this area for both radiologist and radiographers.

TS 21-2
Introduction
R. G. H. Beets-Tan; Amsterdam/NL

TS 21-3
The important role of a radiologist in the communication with patients
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

TS 21-4
Panel discussion: Radiology in 2030: how will we need to practice adding value to the patient?
R. G. H. Beets-Tan; Amsterdam/NL
E. Briers; Hasselt/BE
(erikbriers@telenet.be)
L. E. Derchi; Genoa/IT
(lorenzo.derchi1@gmail.com)
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
C. Justich; Vienna/AT
(cjustich@me.com)
Author Disclosures:
Caroline Justich: Advisory Board: ESR PAG; Founder: Beaccepted

Part 2: The radiographer-patient relationship

Moderators
M. H. Fuchsjäger; Graz/AT
J. McNulty; Dublin/IE

TS 21-6
Introduction
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)

TS 21-7
A holistic approach to patient care: the patient's perspective
E. Steinthaler; Vienna/AT
(post@evelynsteinthaler.com)

TS 21-8
A holistic approach to patient care: the radiographer's perspective
M. Davis; Dublin/IE
(michaela.davis@ucd.ie)

TS 21-9
Panel discussion: Are there sufficient radiographer-focused continuing professional development opportunities related to enhancing communication skills?
E. Briers; Hasselt/BE
(erikbriers@telenet.be)
M. Davis; Dublin/IE
(michaela.davis@ucd.ie)
L. E. Derchi; Genoa/IT
(lorenzo.derchi1@gmail.com)
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
C. Justich; Vienna/AT
(cjustich@me.com)
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)
E. Steinthaler; Vienna/AT
(post@evelynsteinthaler.com)
Author Disclosures:
Caroline Justich: Advisory Board: ESR PAG; Founder: Beaccepted

TS 21-10
Wrap-up
R. G. H. Beets-Tan; Amsterdam/NL

16:00-17:00 **Channel 2**

Refresher Course: Genitourinary

RC 2107
Imaging in male pelvic trauma

RC 2107-1
Chairperson's introduction
J. Belfield; Liverpool/UK

RC 2107-2
Bladder trauma
A. Platon; Geneva/CH
(alexandra.platon@hcuge.ch)

Learning Objectives:
1. To list the classification and the imaging features of bladder injuries.
2. To describe the imaging signs of extra- and intra-peritoneal bladder rupture.
3. To consider the most appropriate CT technique for the diagnosis of bladder injuries.

RC 2107-3
Scrotal trauma
S. Ramanathan; Doha/QA
(drrmsubbu@gmail.com)

Learning Objectives:
1. To understand the role of various imaging modalities in scrotal trauma.
2. To illustrate the imaging appearances of the spectrum of intratesticular and extra testicular injuries.
3. To review the current guidelines from different societies.
4. To highlight the position statements prepared by ESUR-SPIWG.

RC 2107-4
Penile trauma
M. Bertolotto; Trieste/IT
(michele.bertolotto@gmail.com)

Learning Objectives:
1. To learn how to perform an US and MRI investigation in patients with penile traumas.
2. To identify different penile injuries using US and MRI.
3. To learn how to distinguish between injuries requiring a different approach.

Panel discussion: What is the current role of conventional imaging in GU trauma?

16:00-17:00 **Channel 3**

Refresher Course: Musculoskeletal

RC 2110
Joint instability

RC 2110-1
Chairperson's introduction
M. Shahabpour; Brussels/BE
(maryam.shahabpour@gmail.com)

RC 2110-2
Shoulder instability
S. Waldt; Essen/DE

Learning Objectives:
1. To describe the morphological and epidemiological aspects of shoulder instability.
2. To explain new trends in the imaging of shoulder instability.

RC 2110-3
Elbow instability
R. Sutter; Zurich/CH
(reto.sutter@balgrist.ch)

Learning Objectives:
1. To describe the imaging features of acute elbow dislocations.
2. To explain the imaging hallmarks of chronic elbow instability.
Author Disclosures:
Reto Sutter: Other: Balgrist University Hospital has an academic research collaboration with Siemens Healthineers, Balzano Informatik and Bayer. Reto Sutter is a book editor with receipt of royalties from Breitenseher Publisher.

RC 2110-4
Ankle instability, impingement, and imaging treatment
R. Fawcett; Leeds/UK

Learning Objectives:
1. To explain the risk imaging findings of the unstable ankle.
2. To describe the treatment options for the unstable ankle.

Panel discussion: The use of an imaging algorithm in case of clinical suspicion of joint instability

Sunday, March 6

11:30-12:30 **Channel 1**

Round Table Session

RT 24
The green radiology department

RT 24-1
Chairpersons' introduction
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)
A. Brady; Cork/IE
(adrianbrady@me.com)

Learning Objectives:
1. To learn ways to achieve a sustainable and long-term energy saving radiology department.
2. To understand how minor changes to the settings of the reporting stations in a radiology department can result in significant energy savings and promote energy-wise habits.

RT 24-2
The "Green Fingerprint" Project
J. Hohmann; Winterthur/CH
(joachim.hohmann@unibas.ch)

RT 24-3
The "GREENWATER" Project
F. Sardanelli; San Donato Milanese/IT
Author Disclosures:
Francesco Sardanelli: Advisory Board: Bayer, Bracco, General Electric; Equipment Support Recipients: General Electric; Research Grant/Support: Bayer, Bracco, General Electric; Speaker: Bayer, General Electric

RT 24-4
Shaping the radiology department of the future: environmental sustainability
A. G. Rockall; London/UK
(a.rockall@imperial.ac.uk)

RT 24-5
Discussion
L. E. Derchi; Genoa/IT
(lorenzo.derchi1@gmail.com)
J. Hohmann; Winterthur/CH
(joachim.hohmann@unibas.ch)
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)
A. G. Rockall; London/UK
(a.rockall@imperial.ac.uk)
F. Sardanelli; San Donato Milanese/IT
K. Wesdorp; Amsterdam/NL
Author Disclosures:
Luis Martí-Bonmatí: Advisory Board: Quibim SL; Grant Recipient: Several H2020 Projects

15:00-16:00 **Channel 1**

Round Table Session

RT 26
From submission to publication: what you've always wanted to know

RT 26-1
Chairpersons' introduction
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To know how editors handle your manuscript and how the review process of manuscripts is carried out.
2. To know how to carefully and systematically assess the outcome of scientific research (evidence) to judge ist trustworthiness, value and relevance.

RT 26-2
My manuscript was rejected, why?
Y. Menu; Paris/FR
(yves.menu@sat.aphp.fr)

RT 26-3
How do I critically appraise a scientific publication
F. Sardanelli; San Donato Milanese/IT

RT 26-4
Discussion
Y. Menu; Paris/FR
(yves.menu@sat.aphp.fr)
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)
F. Sardanelli; San Donato Milanese/IT
C. Catalano; Rome/IT
(Carlo.Catalano@uniroma1.it)
Author Disclosures:
Luis Martí-Bonmatí: Advisory Board: Quibim SL; Grant Recipient: Several Horizon 2020 projects

B

ECR 2022
Postgraduate Educational Programme – July 13-17, 2022

Patients in Focus (IF)
Clinical Trials in Radiology (CTiR)
EFOMP Workshop (EF)
ESR at Work Sessions
ESR/EFRS/ISRRT meets Sessions (Meets)
European Excellence in Education (E^3)
Image Interpretation Quiz (IIQ)
Joint Sessions
Junior Image Interpretation Quiz (JIIQ)
Open Forum Sessions (OF)
New Horizons Sessions (NH)
Plenary Lectures (PL)
Professional Challenges Sessions (PC)
Refresher Courses (RC)
Round Table Sessions (RT)
Special Focus Sessions (SF)
State of the Art Symposia (SA)
Transatlantic Course of ESR and RSNA (TC)

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Wednesday, July 13

08:00-09:00 **Open Forum #2 (Young ECR)**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESOR

BS 1
Radiologic anatomy: musculoskeletal system

Moderator
K. Verstraete; Ghent/BE

BS 1-3
Spine
B. Tins; Oswestry/UK
(Bernhard.Tins@rjah.nhs.uk)

Learning Objectives:
1. To learn which imaging techniques are available and best suited to visualise specific anatomical structures of the spine.
2. To understand the normal anatomy of the spine.
3. To become familiar with the imaging appearance of the most common normal variants of the spine and their clinical relevance.

BS 1-4
Upper limb
K. Mertens; Merchtem/BE

Learning Objectives:
1. To learn which imaging techniques are available and best suited to visualise specific anatomical structures of the upper limb.
2. To understand the normal anatomy of the upper limb.
3. To become familiar with the imaging appearance of the most common normal variants of the upper limb and their clinical relevance.

Lower limb
A. J. Grainger; Cambridge/UK

Learning Objectives:
1. To learn which imaging techniques are available and best suited to visualise specific anatomical structures of the lower limb.
2. To understand the normal anatomy of the lower limb.
3. To become familiar with the imaging appearance of the most common normal variants of the lower limb and their clinical relevance.
Author Disclosures:
Andrew J. Grainger: Speaker: Canon Medical UK

Questions and answers

08:00-09:00 **Room C**

Patients in Focus

Jointly organised by the ESR and EFRS

IF 1
The radiographer-patient relationship

Moderator
C. Beardmore; London/UK

IF 1-2
Introduction
C. Beardmore; London/UK
(CharlotteB@sor.org)

Learning Objectives:
1. To highlight the uniqueness of the radiographer-patient relationship in medical imaging and radiation therapy.
2. To appreciate the need for continued enhancement of approaches used to improve this relationship.

IF 1-3
A holistic approach to patient care: the patient's perspective
E. Steinthaler; Vienna/AT
(post@evelynsteinthaler.com)

Learning Objectives:
1. To appreciate the diversity of patient needs during medical imaging examinations and radiation therapy.
2. To understand the impact of radiographer interactions on the patient's experience.
3. To consider the importance of personal self-reflection in the context of patient-centred care.

IF 1-4
A holistic approach to patient care: the radiographer's perspective
M. Davis; Dublin/IE
(michaela.davis@ucd.ie)

Learning Objectives:
1. To appreciate the diversity of patient needs during medical imaging examinations and radiation therapy.
2. To understand the impact of radiographer interactions on the patient's experience.
3. To consider the importance of personal self-reflection in the context of patient-centred care.

IF 1-5
How technology can enhance the radiographer-patient interaction: the patient's perspective
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To discuss how technology can be utilised to ensure patients are adequately informed prior to and following examinations and procedures.
2. To appreciate the importance of the radiographer-patient interaction during examinations and procedures.
3. To emphasise the privileged relationship the radiographer holds with their patients.

IF 1-6
How technology can enhance the radiographer-patient interaction: the radiographer's perspective
A. Sarchosoglou; Athens/GR
(anastasia.sarch@outlook.com)

Learning Objectives:
1. To discuss how technology can be utilised to ensure patients are adequately informed prior to and following examinations and procedures.
2. To appreciate the importance of the radiographer-patient interaction during examinations and procedures.
3. To emphasise the privileged relationship the radiographer holds with their patients.

Panel discussion: Are there sufficient radiographer-focused continuing professional development opportunities related to enhancing communication skills?

08:00-09:00 **Room D**

Refresher Course: Breast

RC 102
Contrast-enhanced mammography (CEM)

RC 102-1
Chairperson's introduction
G. Ivanac; Zagreb/HR

RC 102-2
How I do CEM
J. C. Antela López; Las Palmas de Gran Canaria/ES
(jantela@gmail.com)

Learning Objectives:
1. To learn about the technical and human requirements necessary for the performance of CEM.

2. To become familiar with the protocol for performing CEM.
3. To learn how to interpret and report CEM.

RC 102-3
Current evidence: limitations and applications
J. Nori; Florence/IT
(jakopo@tin.it)

Learning Objectives:
1. To learn how to evaluate CEM in preoperative staging.
2. To learn how to evaluate CEM in B3 lesions.
3. learn how to evaluate the most important limitations of CEM, the false negatives, and the second look post CEM.

Panel discussion: As CEM is here to stay, how do we integrate it in our everyday clinical practice?

08:00-09:00 **Room E2**

Refresher Course: Oncologic Imaging

RC 116

Artificial intelligence in oncologic imaging: ready for prime time?

RC 116-1
Chairperson's introduction
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)
Author Disclosures:
Emanuele Neri: Speaker: GE /Healthcare - ESAOTE-Ebit - Bayer

RC 116-2
Artificial intelligence frontiers in oncologic screening
B. Van Ginneken; Nijmegen/NL
(bram.vanginneken@radboudumc.nl)

Learning Objectives:
1. To learn about the features and scientific evidence of commercially available artificial intelligence solutions in oncological screening.
2. To learn about the different strategies for workflow integration of artificial intelligence solutions in screening.
3. To learn about the current research algorithms for oncological screening and unmet needs.
Author Disclosures:
Bram van Ginneken: Founder: Thirona; Other: Royalties from Delft Imaging, MeVis Medical Solutions, Thirona

RC 116-3
Artificial intelligence tumour characterisation: challenges and future prospective
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)

Learning Objectives:
1. To define the best methodology approaches for artificial intelligence developments in tumour characterisation and aggressiveness estimations.
2. To describe the challenges regarding data extraction, data curation, datasets partitions, and standardisation on estimated outputs.
3. To discuss the main solutions for data undersampling, data harmonisation, general context integration, biological correlation, improved reproducibility, and continuous learning.

RC 116-4
Radiomics and data integration
M. Crispin Ortuzar; Cambridge/UK

Learning Objectives:
1. To name and describe the main challenges for multi-dimensional data integration.
2. To describe the most widely used technologies for radiomic data extraction.
3. To differentiate between different machine learning methods for data integration and to identify opportunities for development.
Author Disclosures:
Mireia Crispin Ortuzar: Employee: 52 North Health; Share Holder: 52 North Health; Speaker: GSK, IE University

RC 116-5
Imaging biobanks for artificial intelligence improvement
A. Alberich-Bayarri; Valencia/ES
(angel@quibim.com)

Learning Objectives:
1. To understand how collaborative efforts in data sharing may help to improve the performance of artificial intelligence models that reach clinical use.
2. To learn how to differentiate centralised repository strategies versus federated learning.
3. To discover how to combine multi-omics information in specific platforms for collaborative research in artificial intelligence and medical imaging.
Author Disclosures:
Angel Alberich-Bayarri: CEO: Quibim SL; Founder: Quibim SL; Share Holder: Quibim SL

Panel discussion: Can artificial intelligence improve the oncologic multidisciplinary team?

08:00-09:00 **Room O**

Refresher Course: Abdominal Viscera

RC 101

What should a radiologist do with a fatty liver?

RC 101-1
Chairperson's introduction
V. Vilgrain; Clichy/FR

RC 101-2
How to deal with fatty infiltration of the liver? A clinician's point of view
P. Galle; Mainz/DE

Learning Objectives:
1. To become familiar with the aetiology and treatment of fatty infiltration of the liver.
2. To understand why physicians ask for (additional) imaging.
Author Disclosures:
Peter Galle: Advisory Board: Bayer BMS MSD AstraZeneca SIRTEX Merck Lilly Blueprint Adaptimmune Eisai Roche Ipsen Gilead; Grant recepient: Roche. Bayer

RC 101-3
Quantification of fat: a role for CT?
P. Pickhardt; Madison, WI/US

Learning Objectives:
1. To become familiar with CT techniques allowing the measurement of fat.
2. To understand the correspondence between CT evaluation and histological scores.
3. To learn about the strengths and limitations of CT.
Author Disclosures:
Perry Pickhardt: Advisory Board: Bracco, Nanox, GE Healthcare; Share Holder: Elucent, SHINE

RC 101-4
Quantification of fat: a role for MRI?
G. Corrias; Cagliari/IT
(corriasgmd@gmail.com)

Learning Objectives:
1. To become familiar with MRI techniques allowing the measurement of fat.
2. To understand the correspondence between MRI evaluation and histological scores.
3. To learn about the strengths and limitations of MRI.

Panel discussion: Is quantification relevant for the clinical outcome?

08:00-09:00 **Room X**

Joint Session of the ESR and EFSUMB

ESR/EFSUMB

Multiparametric ultrasound (MPUS) for diagnostic conundrum: where is it useful?

ESR/EFSUMB-1
Chairpersons' introduction
V. Cantisani; Rome/IT
(vito.cantisani@uniroma1.it)
M. D'Onofrio; Verona/IT
Author Disclosures:
Vito Cantisani: Speaker: Samsung Mindray Bracco Canon
Mirko D'Onofrio: Speaker: Bracco, Siemens, Hitachi

ESR/EFSUMB-2
MPUS in breast
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)

Learning Objectives:
1. To understand the role of multiparametric ultrasound in the diagnosis of breast cancer and other breast lesions.
2. To discuss the specific use of B-mode, colour Doppler, strain and shear wave sonoelastography, and CEUS in breast imaging.
3. To discuss the role of ultrasound in screening and in correlation with mammography and breast MRI.

ESR/EFSUMB-3
MPUS in thyroid
V. Cantisani; Rome/IT
(vito.cantisani@uniroma1.it)

Learning Objectives:
1. To provide updated knowledge on TIRADS.
2. To provide the technical principles of US-elastography, CEUS, and artificial intelligence for thyroid nodule characterisation.
3. To update the diagnostic algorithm of thyroid nodules.
Author Disclosures:
Vito Cantisani: Speaker: Samsung Mindray Bracco Canon

ESR/EFSUMB-4
MPUS in testis
M. Bertolotto; Trieste/IT
(michele.bertolotto@gmail.com)

Learning Objectives:
1. To understand the role of multiparametric US in the acute scrotum.
2. To discuss the role of greyscale, Doppler, elastographic modes, and CEUS for testicular lesion characterisation.
3. To provide an updated diagnostic approach to the small, incidentally detected testicular nodule.

ESR/EFSUMB-5
MPUS in pancreas
A. Saftoiu; Bucharest/RO

Learning Objectives:
1. To discuss the various techniques of multiparametric ultrasound (elastography, contrast, fusion, confocal, and artificial intelligence).
2. To discuss the various types of scanning, such as transabdominal, endoscopic, and intraoperative (laparoscopic/robotic), in comparison with CT/MRI.
3. To understand the algorithm of diagnosis and therapy in solid focal pancreatic masses and cystic pancreatic neoplasms.

Panel discussion: Do you believe B-mode ultrasound as a stand-alone technique is outdated?

08:00-09:00 **Room Z**

Refresher Course: Physics in Medical Imaging

RC 113

Blue skies and newest trends in CT

RC 113-1
Chairperson's introduction
A. Boss; Zurich/CH
Author Disclosures:
Andreas Boss: Board Member: GratXray, b-rayZ; Founder: b-rayZ; Research Grant/Support: SNF, CRPP; Share Holder: b-rayZ

RC 113-2
Photon-counting CT
C. H. McCollough; Rochester, MN/US
(mccollough.cynthia@mayo.edu)

Learning Objectives:
1. To describe the properties of photon-counting detectors that are advantageous for clinical CT imaging.
2. To summarise the current clinical evidence supporting the benefits of the use of photon-counting detectors in current CT imaging applications.
3. To identify potential new clinical CT applications enabled by the use of photon-counting detectors.

Author Disclosures:
Cynthia H. McCollough: Advisory Board: Siemens; Board Member: ISCT; Equipment Support Recepient: Siemens; Research Grant/Support: Siemens

RC 113-3
Artificial intelligence-based CT reconstruction
M. Kachelrieß; Heidelberg/DE
(marc.kachelriess@dkfz.de)

Learning Objectives:
1. To learn how image reconstruction works with machine learning.
2. To find out how tube current modulation can benefit from deep learning.
3. To demonstrate that artificial intelligence helps to reduce image artifacts.

RC 113-4
The advances I want to see in the next 10 years
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)

Learning Objectives:
1. To be able to name at least two hardware and three software key technological advances that should be developed in the next decade.
2. To understand what advances are needed to introduce functional CT into clinical routine.
3. To demonstrate how CT-based interventions can profit from technological innovation.
Author Disclosures:
Mathias Prokop: Research Grant/Support: Siemens, Canon; Speaker: Siemens, Canon, Bracco

Panel discussion: What will be the clinical impact of each advance?

09:30-10:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 2Y

Meet the professors: part 1

OF 2Y-1
Chairperson's introduction
M. Reim; Tartu/EE

Learning Objectives:
Distinguished professors of radiology are invited, together with their younger colleagues, to share their experience, their vision, and give advice and guidance to the younger generation of radiologists.

Author Disclosures:
Martin Reim: Board Member: Estonian Society of Radiology; Employee: Tartu University Hospital; Founder: Better Medicine OÜ; Share Holder: Better Medicine OU, Pfizer Corporation

OF 2Y-2
Mentoring in radiology
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

OF 2Y-3
Speed mentoring
Y. Menu; Paris/FR
S. Robinson; Vienna/AT
(s.robinson@dzu.at)
V. Vilgrain; Clichy/FR
E. Berardi; Rome/IT
N. Bogveradze; Amsterdam/NL
(n.bogveradze@nki.nl)
Z. Elkarghali; Amsterdam/NL
(z.elkarghali@nki.nl)

09:30-10:30 **Room A**

Round Table Session

RT 2
Adaptations of screening programmes during the COVID pandemic: what is the impact?

RT 2-1
Chairpersons' introduction
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To learn about the status of colorectal cancer screening in Europe and know how the screening programme was affected by the COVID pandemic.
2. To learn about the effects and lessons learned from changing and adapting cancer screening programmes during the COVID pandemic.

RT 2-2
Changes and adaptations in breast cancer screening during the COVID pandemic
R. M. Pijnappel; Utrecht/NL
(r.m.pijnappel@umcutrecht.nl)
Author Disclosures:
Ruud M. Pijnappel: Research Grant/Support: Hologic, GE, Bayer

RT 2-3
Changes and adaptations in bowel cancer screening during the COVID pandemic
M. Ferlitsch; Vienna/AT

RT 2-4
Discussion
G. Sorensen; Boston, MA/US
R. M. Pijnappel; Utrecht/NL
(r.m.pijnappel@umcutrecht.nl)
G. L. Beets; Amsterdam/NL
(g.beets@nki.nl)
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)
M. Ferlitsch; Vienna/AT
Author Disclosures:
Greg Sorensen: Board Member: Siemens Healthineers, Fresenius Medical Care, IMRIS; CEO: DeepHealth, Inc; the AI division of RadNet, Inc.
Ruud M. Pijnappel: Research Grant/Support: Hologic, GE, Bayer

09:30-10:30 **Room C**

Refresher Course: Musculoskeletal

RC 210
Essential measurements and classifications in musculoskeletal joint imaging

RC 210-1
Chairperson's introduction
M. Reijnierse; Leiden/NL
(m.reijnierse@lumc.nl)
Author Disclosures:
Monique Reijnierse: Research Grant/Support: International Skeletal Society

RC 210-2
Shoulder
U. Aydingoz; Ankara/TR
(uaydingo@hacettepe.edu.tr)

Learning Objectives:
1. To describe the essential measurements and classifications that need to be made in shoulder imaging.
2. To explain how these measurements and classifications relate to pathophysiology and management-related decision making.

RC 210-3
Elbow-wrist-hand
A. Jaudzema; Riga/LV

Learning Objectives:
1. To describe the essential measurements and classifications that need to be made in elbow, wrist, and hand imaging.
2. To explain how these measurements and classifications relate to pathophysiology and management-related decision making.

RC 210-4
Hip
V. Mascarenhas; Lisbon/PT
(vmascarenhas@me.com)

Learning Objectives:
1. To describe the essential measurements and classifications that need to be made in hip imaging.
2. To explain how these measurements and classifications relate to pathophysiology and management-related decision making.

RC 210-5
Knee
C. Rehnitz; Heidelberg/DE
(Christoph.Rehnitz@med.uni-heidelberg.de)

Learning Objectives:
1. To describe the essential measurements and classifications that need to be made in knee imaging.
2. To explain how these measurements and classifications relate to pathophysiology and management-related decision making.

RC 210-6
Ankle-foot
E. De Smet; Antwerp/BE
(elinedesmet@hotmail.com)

Learning Objectives:
1. To describe the essential measurements and classifications that need to be made in ankle and foot imaging.
2. To explain how these measurements and classifications relate to pathophysiology and management-related decision making.

Panel discussion: How to integrate essential measurements and classifications into a structured report?

09:30-11:00 **Room B**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 221

Current issues in chest radiology

E³ 221-1
Non COVID-19 lung infections
A. P. Parkar; Bergen/NO

Learning Objectives:
1. To describe the radiological features of different infectious pulmonary diseases.
2. To understand the importance of clinical data for narrowing the differential diagnosis.

E³ 221-2
Airways disease
G. Dournes; Bordeaux/FR
(gael.dournes@chu-bordeaux.fr)

Learning Objectives:
1. To learn about the spectrum of radiological findings in airways disease.
2. To emphasise the importance of HRCT for the differential diagnosis.

09:30-11:00 **Room D**

New Horizons Session

NH 2

3 years to go: breast imaging in 2025

NH 2-1
Chairperson's introduction
H. Bosmans; Leuven/BE

NH 2-2
Breast x-ray in 2025: acquisition strategies and artificial intelligence techniques
M. L. Giger; Chicago, IL/US
(m-giger@uchicago.edu)

Learning Objectives:
1. To identify and understand the benefits of new mammographic imaging and artificial intelligence techniques.
2. To understand the potential of these new techniques for breast cancer risk assessment, detection, and diagnosis.
3. To describe methods of radiologists' reader studies to enable translation to clinical practice.
Author Disclosures:
Maryellen L. Giger: Author: many journal paper; Employee: University of Chicago; Grant recepient: NIH NIBIB and NCI; Patent Holder: many; Research Grant/Support: NIH NIBIB and NCI; Share Holder: Qview, Qlarity

NH 2-3
Breast MRI in 2025
P. A. T. Baltzer; Vienna/AT

Learning Objectives:
1. To understand the current status of breast MRI in the multimodal field of breast imaging.
2. To obtain an evidenced-based opinion about the present and upcoming competitors of breast MRI.
3. To learn how to apply this knowledge for best care in clinical practice.
Author Disclosures:
Pascal A.T. Baltzer: Board Member: EUSOBI, MIC cluster MUW, Breast imaging working group DRG, urogenital working group OERG; Founder: www.radiologie-weiterbildung.de; Research Grant/Support: Institutional research support by BRACCO for Contrast-enhanced mammography research; Speaker: Bayer

NH 2-4
Breast ultrasound in 2025
C. De Korte; Nijmegen/NL

Learning Objectives:
1. To identify and understand the benefits of new ultrasound imaging techniques.
2. To understand the potential of these new techniques for breast cancer detection.
3. To be able to make a proper judgement on how to apply these in daily work.

NH 2-5
The breast imaging clinic in 2025 and beyond
E. M. Fallenberg; Munich/DE

Learning Objectives:
1. To understand the role of the radiologist in the breast imaging clinic of 2025.
2. To learn about the challenges in the breast imaging clinic today and discuss what may be resolved with new technology.
3. To identify priorities for the future (even beyond 2025).
Author Disclosures:
Eva M. Fallenberg: Advisory Board: Bayer, Siemens, GE,; Board Member: DRG-AG-Mammadiagnostik, EUSOBI, AGO-Mamma, S3 Guidelines Breast cancer; Speaker: Bayer, Siemens, GE, Guerbet, BD, Roche

Panel discussion: How off are we in 2022?

09:30-11:00 **Room E1**

E³ - Young ECR Programme: Basic Sessions

Organised by the EFRS

BS 2

Developing our future radiography academics

Moderator
C. Buissink; Groningen/NL

BS 2-2
Priorities in academic recruitment and development
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)

Learning Objectives:
1. To describe the ideal attributes of a new academic recruit.
2. To reflect on the translational experiences and skills that a clinical radiographer can bring to an academic role.
3. To consider the expectations relating to lifelong learning and professional development.

BS 2-3
Preparing for an academic career
M. Zanardo; Milan/IT
(moreno.zanardo@unimi.it)

Learning Objectives:
1. To consider opportunities to become involved in radiography education.
2. To understand the importance of being motivated to gain research experience.
3. To appreciate the necessary commitment to students.

BS 2-4
Clinical academics
B. Snaith; Bradford/UK

Learning Objectives:
1. To understand different models of clinical academic roles.
2. To consider how clinical academic roles can enhance academic practice.
3. To explore the challenges and enablers of these dual roles.

BS 2-5
Benefits of an academic career
L. J. O. C. Lança; Lisbon/PT
(luis.lanca@estesl.ipl.pt)

Learning Objectives:
1. To explore the diversity offered through an academic career.
2. To appreciate how an academic career can positively impact the profession.
3. To discuss the impact of being an academic on my professional journey.

Panel discussion: How can we overcome barriers to ensure skilled clinical radiographers can have academic career options?

09:30-11:00 **Room E2**

Special Focus Session

SF 2b

Acute abdomen: a radiologist's survival guide

SF 2b-1
Chairperson's introduction
J. Stoker; Amsterdam/NL

SF 2b-2
Blunt abdominal trauma: a systematic approach
S. Schmidt Kobbe; Lausanne/CH
(sabine.schmidt@chuv.ch)

Learning Objectives:
1. To learn how to localise and classify abdominal injury.
2. To learn which diagnostic algorithm to use in haemodynamically stable and unstable trauma patients.
3. To discuss imaging findings in injured abdominal organs and the GI tract.
4. To understand how accurate preoperative diagnosis and classification impacts management.

SF 2b-3
Suspicion of GI perforation: a systematic approach
D. J. M. Tolan; Leeds/UK
(damian.tolan@nhs.net)

Learning Objectives:
1. To learn how to localise the site of perforation in the upper and lower GI tract.
2. To understand the range of benign and malignant pathologies that can be detected with imaging.
3. To understand how accurate preoperative diagnosis influences surgical management.

SF 2b-4
Suspicion of GI ischaemia: a systematic approach
A. R. Radmard; Tehran/IR

Learning Objectives:
1. To review the main clinical presentations of GI ischaemia and differentiate acute from chronic forms.
2. To discuss the main imaging features of GI ischaemia in the light of GI ischaemia pathophysiology.
3. To understand the prognostic role of imaging and differentiate ischaemia from necrosis.
4. To consider imaging as an integrated part in the treatment and management of patients with suspected GI ischaemia.

SF 2b-5
Suspicion of abdominal inflammation: a systematic approach
I. Millet; Montpellier/FR
(milletingrid@wanadoo.fr)

Learning Objectives:
1. To learn about the inflammatory pathologies that can be detected at imaging.
2. To learn how to localise and diagnose abdominal inflammation and its complications.
3. To understand how accurate diagnosis influences management.

Panel discussion: How do you outsmart your surgeon?

09:30-11:00 **Room K**

E^3 - Advanced Courses: Head and Neck Imaging

E^3 222

Follow-up after treatment for head and neck cancer: recurrence or not? A multidisciplinary approach

E^3 222-1
Chairperson's introduction
E. Comans; Amsterdam/NL
(E.comans@haaglandenmc.nl)

Learning Objectives:
1. To interpret diagnostic imaging findings that may indicate recurrence.
2. To suggest 'imaging surveillance' protocols (Ni-Rads?).
3. To suggest additional imaging (e.g., ultrasound-guided biopsy or PET/CT) in challenging clinical situations.

E^3 222-2
Follow-up after treatment for head and neck cancer: the surgical perspective
B. van der Laan; The Hague/NL
(b.van.der.laan@haaglandenmc.nl)

Learning Objectives:
1. To identify the goals of follow-up after the treatment of head and neck cancer.
2. To describe the difficulties in salvage surgery.
3. To describe the management of residual neck disease.
4. To understand the meaning of detection of distant metastases and second primary tumours during follow-up.

E^3 222-3
Optimal imaging strategy for follow-up after treatment for head and neck cancer: a nuclear physician's perspective
E. Comans; Amsterdam/NL
(E.comans@haaglandenmc.nl)

Learning Objectives:
1. To apply a dedicated head and neck PET/CT imaging protocol.
2. To describe different scoring systems for visual and semi-quantitative response assessment (NI-RADS/Hopkins).
3. To distinguish signs of recurrence from pitfalls and false-positive PET findings.

E^3 222-4
Imaging features after treatment for head and neck cancer: the radiologist's perspective
F. A. Pameijer; Utrecht/NL
(f.a.pameijer@umcutrecht.nl)

Learning Objectives:
1. To describe the expected radiological findings post (chemo) radiotherapy.
2. To define the appropriate interval between the end of therapy and the first (baseline) imaging study for response evaluation.
3. To apply the NI-RADS classification system to grade the possibility of recurrence on post-therapeutic imaging studies of the head and neck.

E^3 222-5
Multidisciplinary tumour board: case-based panel discussion
E. Comans; Amsterdam/NL
(E.comans@haaglandenmc.nl)

09:30-11:00 **Room M 4**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 219

Bone metastases: a multidisciplinary approach

E³ 219-1
Chairpersons' introduction
F. Gómez Muñoz; Barcelona/ES
(fernan.m.gomez@gmail.com)
R. L. Cazzato; Strasbourg/FR

Learning Objectives:
1. To outline the importance of a multidisciplinary management of complex bone metastases.
2. To review the newest strategies for the multidisciplinary approach in the treatment of bone metastasis and oligometastatic disease.
3. To discuss tailored approaches combining locoregional and systemic treatments.

E³ 219-2
Oncologic and integrated management of bone metastases: the oncologist's perspective
P. Trensz; Strasbourg/FR

E³ 219-3
Radiation therapy of bone metastases: the radiation oncologist's perspective
S. Heymann; Strasbourg/FR
(sheymann@solcrr.org)

E³ 219-4
Interventional treatment of bone metastases: the interventional radiologist's perspective
R. L. Cazzato; Strasbourg/FR

E³ 219-5
Case-based discussions
F. Gómez Muñoz; Barcelona/ES
(fernan.m.gomez@gmail.com)
R. L. Cazzato; Strasbourg/FR

09:30-11:00 **Room N**

Special Focus Session

SF 2a

Plaque imaging in 2022

SF 2a-1
Chairperson's introduction
D. Pickuth; Saarbrücken/DE

SF 2a-2
Plaque imaging: a cardiologist's perspective
M. Flather; Norwich/UK
(M.Flather@uea.ac.uk)

Learning Objectives:
1. To understand plaque morphology.
2. To describe the concept of vulnerable plaques.
3. To explain the rationale for imaging.

SF 2a-3
CT
P. Maurovich-Horvat; Budapest/HU
(maurovich.horvat@gmail.com)

Learning Objectives:
1. To identify the four conventional adverse coronary plaque features.
2. To describe quantitative plaque assessment and understand radiomic approaches to precision phenotyping of coronary atherosclerosis.
3. To reflect on how cardiac CT can guide personalised cardiovascular preventive therapeutic strategies.
Author Disclosures:
Pál Maurovich-Horvat: Share Holder: Neumann Medical Ltd.

SF 2a-4
MRI
L. Saba; Cagliari/IT

Learning Objectives:
1. To identify the role of MRI in plaque imaging according to current trial evidence for stroke risk stratification.
2. To discuss MRI techniques to analyse carotid plaque morphology and composition.
3. To critically review the current possibilities and limits for treatment decision making.

Panel discussion: Plaque imaging: where are we now?

11:30-12:30 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 3R

The future of the radiographer profession

Moderator
J. McNulty; Dublin/IE

Learning Objectives:
1. To consider the approach taken by the EFRS to investigate the future directions of our profession.
2. To discuss specific considerations linked to radiographer education, research, and practice.

OF 3R-2
What does the EFRS Radiographer Education, Research, and Practice Project tell us about the future?
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)

OF 3R-3
The direction of travel for the radiographer profession
G. Paulo; Coimbra/PT
(graciano@estescoimbra.pt)

OF 3R-4
Education: panel and open discussion
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)

OF 3R-5
Research: panel and open discussion
K. Knapp; Exeter/UK
(K.M.Knapp@exeter.ac.uk)
Author Disclosures:
Karen Knapp: Grant recepient: Siemens, Stryker, Royal Osteoporosis Society; Research Grant/Support: Siemens, Stryker, Royal Osteoporosis Society

OF 3R-6
Practice: panel and open discussion
C. Beardmore; London/UK
(CharlotteB@sor.org)

11:30-12:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 3Y

My involvement in a subspecialty committee: a multidisciplinary perspective (part 1)

OF 3Y-1
Chairperson's introduction
D. M. Lambregts; Amsterdam/NL
(doenja.lambregts@gmail.com)

Learning Objectives:
Part of a series dedicated to young radiologists and young clinicians, as part of the ECR 2022 theme of building bridges, who are members of a subspecialty society and will describe their experience and discuss the role of (future) radiologists from the multidisciplinary view of the young generation.

OF 3Y-2
JESPeR
J. Jurgens; Hamburg/DE
(j.juergens@uke.de)
Author Disclosures:
Julian Jurgens: Board Member: ESPR

OF 3Y-3
Young ESOI
D. Caruso; Rome/IT
Author Disclosures:
Damiano Caruso: Grant recepient: Cancers; Speaker: Bayer, Bracco, GE

OF 3Y-4
Young ESSO
Y. Schrage; Amsterdam/NL
(y.schrage@nki.nl)

Discussion

11:30-12:30 **Room A**

Round Table Session

RT 3

Building bridges: value-based radiology in musculoskeletal imaging, a multidisciplinary perspective

RT 3-1
Chairperson's introduction
J. J. Visser; Rotterdam/NL
(j.j.visser@erasmusmc.nl)

Learning Objectives:
1. To understand the perspectives of our clinical partner on the value proposition in radiology.
2. To know which radiological services should be provided to ensure the value of radiology.
Author Disclosures:
Jacob J. Visser: Advisory Board: Contextflow, Quibim

RT 3-2
Value in musculoskeletal radiology: the clinician's perspective
T. Piscaer; Rotterdam/NL

RT 3-3
Value in musculoskeletal radiology: the radiologist perspective
P. Omoumi; Lausanne/CH
(patrick.omoumi@chuv.ch)

RT 3-4
Panel discussion
T. Piscaer; Rotterdam/NL
P. Omoumi; Lausanne/CH
R. Merges; Erlangen/DE
(reto.merges@siemens-healthineers.com)
H. Agrell; Barcelona/ES
Author Disclosures:
Reto Merges: Employee: Siemens Healthineers

11:30-12:30 **Room B**

E^3 - The Beauty of Basic Knowledge: Pancreas

E^3 25A

Acute pancreatitis

Moderator
R. Manfredi; Rome/IT

E^3 25A-2
Atlanta classification of acute pancreatitis
T. Bollen; Nieuwegein/NL
(tlbollen@hotmail.com)

Learning Objectives:
1. To understand grading of acute pancreatitis using the Atlanta classification.
2. To learn about the clinical impact of the Atlanta classification.
3. To understand the follow-up of acute pancreatitis.

E^3 25A-3
Role of imaging
C. Triantopoulou; Athens/GR
(ctriantopoulou@gmail.com)

Learning Objectives:
1. To learn about diagnosing acute pancreatitis.
2. To understand how to apply the Atlanta classification to imaging.
3. To learn about new trends in the diagnosis of acute pancreatitis.

11:30-12:30 **Room E2**

Refresher Course: Vascular

RC 315

Vascular compression syndromes

RC 315-1
Chairperson's introduction
P. Reimer; Karlsruhe/DE

RC 315-2
Above the diaphragm
T. Leiner; Utrecht/NL
(t.leiner@umcutrecht.nl)

Learning Objectives:
1. To identify the most common vascular compression syndromes in the chest and upper extremities.
2. To describe how to evaluate and recognise compression syndromes above the diaphragm with CT and MRI.
3. To understand the current treatment options for vascular compression syndromes above the diaphragm.

RC 315-3
Below the diaphragm
S. Duvnjak; Odense/DK
(duvnjak.stevo@gmail.com)

Learning Objectives:
1. To name, identify, and differentiate the leading causes of abdominal and pelvic vascular compression syndrome.

2. To summarise, analyse, and apply diagnostic workflow for different vascular compression syndrome and interpret the main imaging findings.
3. To describe the clinical presentations and reflect on the main treatment principles and techniques.

Panel discussion: The need for interdisciplinarity in the treatment of vascular compression syndromes

11:30-12:30 **Room K**

E³ - The Beauty of Basic Knowledge: A Survival Guide to Musculoskeletal Imaging

E³ 24A

Fundamentals of musculoskeletal trauma

Moderator
A. Leone; Rome/IT

Learning Objectives:
Many factors play a role in musculoskeletal trauma: velocity of injury, direct/indirect vectors, site of impact, distraction/compression mechanisms, acceleration/deceleration forces, acute/repetition, age, predisposing bone weakness, and previous treatment. As a result of these various mechanisms, patterns of injury and their imaging manifestations need to be understood. Optimising the use of the imaging modalities in the identification of injury and the complications is an essential pre-requisite in ensuring that it is not missed and to offer the correct treatment.

E³ 24A-2
Paediatric skeleton
V. Mascarenhas; Lisbon/PT
(vmascarenhas@me.com)

Learning Objectives:
1. To name and identify the most common causes of trauma in the paediatric population.
2. To list the steps of assessment in the paediatric trauma patient and determine the appropriate imaging diagnosis.
3. To describe and reflect on how a specific imaging diagnosis influences the therapeutical management in the paediatric population.

E³ 24A-3
Commonly missed peripheral injury
R. Sutter; Zurich/CH

Learning Objectives:
1. To name three commonly missed musculoskeletal injuries of the shoulders and arms.
2. To describe three commonly missed musculoskeletal injuries of the lower extremities.
3. To identify imaging pitfalls that are commonly seen when assessing musculoskeletal trauma.
Author Disclosures:
Reto Sutter: Author: Book editor with receipt of royalties from Breitenseher Publisher.; Other: Balgrist University Hospital has an academic research collaboration with Siemens Healthineers, Balzano Informatik and Bayer.

E³ 24A-4
Spine
A. Leone; Rome/IT
(antonio.leone1@unicatt.it)

Learning Objectives:
1. To understand the importance of the mechanism of injury in the setting of spinal trauma.
2. To discuss the role of radiography, CT, and MR imaging in the detection and evaluation of spinal trauma.
3. To become familiar with the most relevant imaging features of cervical and thoracolumbar trauma.

Panel discussion

11:30-12:30 **Room M 4**

E³ - The Beauty of Basic Knowledge: Problem Solving Tips and Tricks for Brain Imaging

E³ 30A

Cerebral ischaemia

Moderator
L. van den Hauwe; Antwerp/BE

E³ 30A-2
Cerebral ischaemia: beyond the usual suspects
T. van der Zijden; Antwerp/BE
(thijs.van.der.zijden@uza.be)

Learning Objectives:
1. To discuss the watershed area infarctions and how they can be identified.
2. To learn how to diagnose reversible cerebral vasoconstriction syndrome.
3. To become familiar with cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) and how to establish this diagnosis on imaging findings.

E³ 30A-3
How to assess and report CT angiography of the neck and intracranial vessels
E. Johansson; Umea/SE
(elias.johansson@umu.se)

Learning Objectives:
1. To learn how to review a CT angiography study from the aortic arch to the intracranial vessels.
2. To identify how to accurately quantify vessel narrowing.
3. To assess the type and stability of atheromatous plaques.

E³ 30A-4
How to diagnose cerebral vein or dural sinus thrombosis and venous infarctions
D. Aguiar de Sousa; Lisbon/PT
(dianasousa@campus.ul.pt)

Learning Objectives:
1. To review the preferred imaging techniques for assessing the intracranial venous system.
2. To identify the tell-tale signs of cerebral venous occlusions.
3. To become familiar with the parenchymal manifestations and potential complications of this condition.
Author Disclosures:
Diana Aguiar de Sousa: Advisory Board: AstraZeneca; Board Member: European Stroke Organization; Grant recepient: AstraZeneca-FMUL, Amelia de Mello Foundation; Research Grant/Support: Boehringer Ingelheim; Speaker: Bayer

11:30-12:30 **Room O**

Joint Session of ESR and EIBIR

ESR/EIBIR 3

The MEDIRAD project: improving medical radiation protection for patients and staff

ESR/EIBIR 3-1
Chairpersons' introduction
E. Cardis; Barcelona/ES
G. Frija; Paris/FR
(guyfrija@gmail.com)

ESR/EIBIR 3-2
CT exposure in childhood and subsequent risk of cancer
E. Cardis; Barcelona/ES

Learning Objectives:
1. To understand risk estimation for children, a sensitive population whose exposure has increased substantially in the recent decades.
2. To understand retrospective reconstruction of doses.
3. To learn about the long-term follow-up of populations, taking into account potential confounders.

ESR/EIBIR 3-3
Patient-specific radiation dose and cancer risk for chest CT
J. Stratakis; Iraklion/GR

Learning Objectives:
1. To provide information about a novel CT dosimetry tool developed within the framework of the MEDIRAD Horizon 2020 project.
2. To appreciate the value of accurate dosimetry in CT.
3. To understand the limitations of current CT dosimetry methods and tools.

ESR/EIBIR 3-4
Cardiac CT and cardiac MRI biomarkers before and after breast cancer irradiation: the EARLY-HEART study
E. Mousseaux; Paris/FR
(elie.mousseaux@egp.ap-hop-paris.fr)

Learning Objectives:
1. To understand how to evaluate the effect of irradiation on the heart after breast cancer treatment by CT and MRI.
2. To become familiar with the EARLY-HEART study.
3. To understand what we have learnt from the study.

ESR/EIBIR 3-5
Effectiveness of staff radioprotective equipment during interventional procedures with a special focus on the eye lens and the brain
J. Dabin; Mol/BE
(jeremie.dabin@sckcen.be)

Learning Objectives:
1. To review recent information on selected equipment effectiveness.
2. To learn about their advantages and limitations.
3. To understand the influence of their conditions of use.

ESR/EIBIR 3-6
EIBIR activities and upcoming funding opportunities
N. Peld; Vienna/AT

Learning Objectives:
1. To learn about EIBIR activities and support services.
2. To understand how EIBIR can increase funding success.
3. To become familiar with European research funding opportunities, in particular, Horizon Europe.

Panel discussion: How can the results of the MEDIRAD project be translated into daily clinical practice?

13:00-14:00 **Open Forum #1 (Radiographers)**

Open Forum Session

Jointly organised by the EFRS and EuSoMII

OF 4R

Specialising in medical imaging informatics

OF 4R-1
Chairperson's introduction
C. Kamp; Vienna/AT
(christoph.kamp@fh-campuswien.ac.at)

Learning Objectives:
1. To describe the current status of medical informatics in medical imaging and radiation oncology.
2. To consider the role of radiographers in the management and delivery of quality medical informatics structures.
3. To compare the roles of radiographers as medical informatics specialists in different countries.

OF 4R-2
What lies ahead in medical imaging informatics: the EuSoMII perspective
E. Kotter; Freiburg/DE
Author Disclosures:
Elmar Kotter: Advisory Board: Contextflow; Share Holder: Contextflow; Speaker: Siemens Healthineers, AbbVie

OF 4R-3
My role as a medical imaging informatics specialist
C. Whitfield; Dublin/IE
S. Lysdahlgaard; Esbjerg/DK
(Simon.Lysdahlgaard@rsyd.dk)

Open forum discussion

13:00-14:00 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 4Y

My involvement in a subspecialty committee: a multidisciplinary perspective (part 2)

OF 4Y-1
Chairperson's introduction
D. M. Lambregts; Amsterdam/NL
(doenja.lambregts@gmail.com)

Learning Objectives:
Part of a series dedicated to young radiologists and young clinicians, as part of the ECR 2022 theme of building bridges, who are members of a subspecialty society and will describe their experience and discuss the role of (future) radiologists from the multidisciplinary view of the young generation.

OF 4Y-2
EuSoMII Young Club
M. Klontzas; Iraklion/GR
(miklontzas@gmail.com)
Author Disclosures:
Michail Klontzas: Board Member: EuSoMII; Other: EuSoMII Young Club Member

OF 4Y-3
Young UEG
H. Heinrich; Zurich/CH

OF 4Y-4
Young ESGAR
K. N. De Paepe; London/UK
(katja.depaepe@icr.ac.uk)

Discussion

13:00-14:00 **Open Forum #4 (ESR)**

Open Forum Session

Organised by EuroSafe Imaging

OF 4b

New applications and technologies for the medical use of ionising radiation and related quality and safety perspectives (an update from the EURAMED rocc-n-roll project)

OF 4b-1
Chairpersons' introduction
C. Hoeschen; Magdeburg/DE
(christoph.hoeschen@ovgu.de)
K. Riklund; Umea/SE
(katrine.riklund@umu.se)
Author Disclosures:
Katrine Riklund: Board Member: CMRAD AB, DICOM PORT AB

OF 4b-2
New applications and technologies in interventional procedures
C. Iosif; Nicosia/CY
(christina.iosif@gmail.com)

Learning Objectives:
1. To describe the new technologies and applications in the angiosuite in INR, in relation to image optimisation.
2. To describe the new technologies and applications in the angiosuite in INR, in relation to dose reduction.
3. To demonstrate the role of combined modality techniques for dose and image optimisation in INR.
4. To define the “game changers” in regards to the new developments and trends in INR, as identified in the Rocc N Roll wp 3.
Author Disclosures:
Christina Iosif: Patent Holder: ROCC-N-ROLL

OF 4b-3
New developments in paediatric radiology
C. Granata; Genoa/IT

Learning Objectives:
1. To learn how photon counting CT and artificial intelligence can become game changers in diagnostic imaging.
2. To understand the present state of the art and limits of these technologies.
3. To understand how these technologies can improve quality and safety in paediatric radiology.

OF 4b-4
The clinical EURAMED rocc-n-roll perspective on new developments
K. Riklund; Umea/SE
(katrine.riklund@umu.se)

Learning Objectives:
1. To understand how to identify new needs for developments in the work with a strategic agenda.
2. To know the content of the clinical input to the research agenda and the relation to quality and safety perspectives.
3. To describe and reflect on the work with a strategic research agenda.
Author Disclosures:
Katrine Riklund: Advisory Board: Prismap, SAMIRA; Board Member: Dicom Port AB, Collective Minds Radiology AB

OF 4b-5
Open forum discussion

13:00-14:30 **Room B**

E³ - Advanced Courses: Cancer Imaging

E³ 418

Soft tissue sarcoma: a multidisciplinary approach

E³ 418-1
Chairperson's introduction
P. O'Donnell; Stanmore/UK

Learning Objectives:
1. To learn about the treatment of soft tissue sarcoma and understand the impact of imaging.
2. To learn about the imaging features of soft tissue masses and the differentiation of benign from malignant lesions.
3. To learn about the accuracy of imaging methods for local and distant staging of soft tissue sarcoma.

E³ 418-2
Soft tissue sarcomas and tight margins: surgical realities
M. A. J. van de Sande; Leiden/NL
(m.a.j.van_de_sande@lumc.nl)

Learning Objectives:
1. To understand the heterogeneity of different types of soft tissue sarcoma and their clinical presentation.
2. To understand the multimodality treatment policy including (neo)adjuvant treatment with chemo- or radiotherapy and its influence on prognosis.
3. To create awareness for the need of clinical context in the evaluation of follow-up scans after soft tissue sarcoma treatment.
Author Disclosures:
Michiel A.J. van de Sande: Advisory Board: Daiichy Sankyo, Implantcast, AmMax Bio, Deciphera, SYNOX THERAPEUTICS LTD; Grant recepient: Daiichy Sankyo, Implantcast, Carbofix; Investigator: phase 2-3 trials AmMax Bio

E³ 418-3
General imaging features of a soft tissue mass: can a benign mass be reliably distinguished from a sarcoma?
P. O'Donnell; Stanmore/UK
(paulodonnell@nhs.net)

Learning Objectives:
1. To identify the general imaging features of a high-grade soft tissue sarcoma.
2. To understand where specific diagnoses may be possible based on imaging.
3. To understand the importance of histological diagnosis where imaging is indeterminate.

E³ 418-4
Distant staging of soft tissue sarcoma
M. Calleja; Stanmore/UK
(michele.calleja@nhs.net)

Learning Objectives:
1. To review the metastatic spread of soft tissue sarcoma and understand which histological types exhibit different spread patterns.
2. To discuss routine whole body staging in the context of soft tissue sarcoma, with special reference to chest CT.
3. To understand the management of indeterminate lung nodules on chest CT staging.
4. To learn about the selective use of FDG-PET and regional MRI/CT in specific sarcomas and in disease recurrence.
5. To understand which distant staging is necessary when dealing with a biopsy-proven soft tissue sarcoma.

E³ 418-5
Multidisciplinary tumour board: case based panel discussion
P. O'Donnell; Stanmore/UK
(paulodonnell@nhs.net)
K. van Langevelde; Leiden/NL
M. A. J. van de Sande; Leiden/NL
(m.a.j.van_de_sande@lumc.nl)
Author Disclosures:
Michiel A.J. van de Sande: Advisory Board: Daiichy Sankyo, Implantcast,

AmMax Bio, Deciphera, SYNOX THERAPEUTICS LTD.; Grant recepient: Daiichy Sankyo, Implantcast, Carbofix; Investigator: AmMax Bio; Speaker: Daiichy Sankyo, Implantcast, Carbofix, Deciphera

13:00-14:30 **Room C**

E³ - Advanced Courses: Lung, Mediastinum and Pleural Imaging

E³ 431

Solid lung nodules: how to diagnose and treat – a multidisciplinary approach

E³ 431-1
Chairperson's introduction
J. Biederer; Heidelberg/DE
(juergen.biederer@gmx.net)

Learning Objectives:
1. To provide an integrated diagnostic algorithm for the differential diagnosis of solid lung nodules.
2. To identify CT features suggesting a benign lesion.
3. To discuss the multidisciplinary management of patients with solid lung nodules.
Author Disclosures:
Jürgen Biederer: Research Grant/Support: Siemens, Bayer; Speaker: Roche, Boehringer Ingelheim, Fuji

E³ 431-2
Morphological approach to solid lung nodules
A. Nair; London/UK

Learning Objectives:
1. To understand the importance of nodule morphology in distinguishing benign and malignant nodules.
2. To review the typical morphological features of benign and malignant nodules.
3. To understand the role of morphology assessment in nodule management.
Author Disclosures:
Arjun Nair: Advisory Board: Aidence BV; Investigator: DART trial; Research Grant/Support: Biomedical Research Centre, UCLH; Speaker: Honoraria for MSD and Astra Zeneca

E³ 431-3
How to manage solid lung nodules
C. de Margerie-Mellon; Paris/FR

Learning Objectives:
1. To review the definition of "solid pulmonary nodule" and to define what should and what should not be "managed".
2. To summarise the management recommendations of the current guidelines.
3. To identify the challenges and limitations of these guidelines and layout how they can be overcome in clinical practice and research.

E³ 431-4
What to expect from artificial intelligence (AI)
C. Jacobs; Nijmegen/NL
(colin.jacobs@radboudumc.nl)

Learning Objectives:
1. To explain what types of AI systems are currently available for lung nodules on CT.
2. To learn how to evaluate the performance claims and published scientific evidence of AI.
3. To discuss what to expect of AI in clinical practice.
Author Disclosures:
Colin Jacobs: Research Grant/Support: Host institution receives research grants from MeVis Medical Solutions AG, Bremen, Germany; Other: Host institution receives royalties from MeVis Medical Solutions AG, Bremen, Germany

E³ 431-5
Multidisciplinary tumour board: case-based panel discussion
J. Biederer; Heidelberg/DE
D. Moore; London/UK
S. Wan; London/UK

13:00-14:30 **Room E1**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESR

BS 4a

Genitourinary

Moderator
B. Hamm; Berlin/DE

BS 4a-2
Imaging of the kidney
O. Nikolic; Novi Sad/RS
(olivera.nikolic@mf.uns.ac.rs)

Learning Objectives:
1. To present the current imaging techniques for the evaluation of the kidney.
2. To demonstrate the most important findings of common kidney pathologies.

BS 4a-3
Imaging of the urinary bladder
A. T. Turgut; Ankara/TR

Learning Objectives:
1. To present the current imaging techniques for the evaluation of the urinary bladder.
2. To demonstrate the most important findings of urinary bladder pathologies.

BS 4a-4
Imaging of the testis
L. E. Derchi; Genoa/IT

Learning Objectives:
1. To present the current imaging techniques for the evaluation of the testis.
2. To illustrate the imaging features in testicular pathologies.

13:00-14:30 **Room E2**

Clinical Trials in Radiology

CTiR 4

Clinical Trials in Radiology 1

CTiR 4-1
Chairpersons' introduction
M. Dewey; Berlin/DE
A. Brady; Cork/IE
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

CTiR 4-2
Mammography screening with stand-alone artificial intelligence compared to single and double reading with and without consensus discussions
V. Dahlblom, M. Dustler, *A. Tingberg*, S. Zackrisson; Malmo/SE
(anders.tingberg@skane.se)

Purpose: Artificial intelligence has been shown to be at least equivalent to a single human reader at detecting cancers on digital mammography (DM), but its performance compared to human double reading is unclear.
Methods or Background: The study is based on the Malmö Breast Tomosynthesis Screening Trial (MBTST), where DM and digital breast tomosynthesis (DBT) from 14848 women were separately double read. Decisions from both DM readers and consensus discussion results were compared with ROC-curves for an AI system (ScreenPoint Transpara 1.7) analysing DM. Sensitivity and specificity was compared. Ground truth was defined by cancers detected at DM or DBT screening or as interval cancers during 1.5-2 years, thus relatively low sensitivity at DM is expected.
Results or Findings: Single reading in DM without consensus discussion had a sensitivity of 53.5% with a specificity of 93.8%. This was outperformed by the AI system with a sensitivity of 61.0% at the same specificity. For single reader with consensus meeting the sensitivity was 47.1% and specificity 98.6%, which

is marginally better than AI (sensitivity 45.0% at corresponding specificity). With double reading the sensitivity was 64.3% and specificity 92.4%, which is on par with AI results (sensitivity 63.3% at corresponding specificity). However, DM double reading with consensus outperforms AI with a sensitivity of 60.5% at specificity 98.2%, while AI had a sensitivity of 47.2% at corresponding specificity.
Conclusion: AI can outperform a single reader in DM screening without consensus and perform on par with either single reader with consensus or double readers without consensus. However, double reading with consensus is clearly better than AI.
Limitations: The limitations for this study include its nature as a single-centre study with a single vendor, and that the interaction between readers and AI was not studied.
Ethics committee approval: Approved, informed consent was used.
Funding for this study: Swedish Governmental Funding for Clinical Research, The Swedish Cancer Society.
Author Disclosures:
Anders Tingberg: Grant Recipient: Siemens Healthineers
Victor Dahlblom: Equipment Support Recipient: ScreenPoint Medical
Magnus Dustler: Patent Holder: US 9 833 203
Sophia Zackrisson: Speaker: Siemens Healthineers Patent Holder: US 9 833 203

CTiR 4-3

Discussant of: Mammography screening with stand-alone artificial intelligence compared to single and double reading with and without consensus discussions
E. M. Fallenberg; Munich/DE

CTiR 4-4

Development and multicentre validation of a multiparametric imaging model to predict treatment response in rectal cancer
N. Schurink, S. van Kranen, J. J. van Griethuysen, S. Roberti, P. Snaebjornsson, N. Bogveradze, N. El Khababi, R. G. H. Beets-Tan, D. M. J. Lambregts; Amsterdam/NL

Purpose: The purpose of the study is to develop and validate a multiparametric imaging model to predict response to neoadjuvant treatment in rectal cancer using a clinically representative heterogeneous multicentre dataset of baseline staging MRIs.
Methods or Background: Primary staging MRIs (T2W; DWI/ADC) of 509 rectal cancer patients treated with neoadjuvant chemoradiotherapy (CRT) were collected from nine centres. Response outcome was defined in twofold as (1) complete vs. incomplete response, and (2) good (Mandard tumour regression grade 1-2) vs. poor response (TRG3-5). Models to predict these outcomes were developed based on (combinations of) the following variable groups: (1) non-imaging: age/sex/tumour-location/tumour-morphology/CRT-surgery interval, (2) basic-imaging staging: cTN-stage/mesorectal fascia involvement, derived from (2a) the original staging reports, and (2b) from re-evaluation of the images by a dedicated expert, (3) advanced-imaging staging: (2b) + cTN-substaging/depth of invasion/extramural vascular invasion/tumour length, (4) quantitative imaging (first-order features/volume) derived from T2W-MRI and ADC using whole-tumour delineations. Logistic regression prediction models were developed using data from 6/9 centres (n=412) with repeated random hold-out validation and LASSO feature selection. The best performing model was then externally validated on data from the remaining 3/9 centres (n=97).
Results or Findings: After external validation, the best performing model (including non-imaging and advanced staging variables) achieved an area under the curve (AUC) of 0.60 (95%CI=0.48-0.72) to predict a complete and AUC0.65 (95%CI=0.53-0.76) to predict a good response. Quantitative imaging variables did not improve model performance. Basic staging variables consistently achieved lower performance compared to advanced image staging variables.
Conclusion: Overall model performance to predict response was moderate. Best results were obtained with advanced image-based staging variables, highlighting the importance of state-of-the-art clinical staging. Quantitative imaging features had no added value in this heterogeneous multicentre dataset.
Limitations: No limitations were identified.
Ethics committee approval: Yes (METC18.1090)
Funding for this study: Dutch Cancer Society (project number 10138)
Author Disclosures:
Sander Roberti: Nothing to disclose
Joost J.M. van Griethuysen: Nothing to disclose
Petur Snaebjornsson: Nothing to disclose
Najim El Khababi: Nothing to disclose
Doenja Marina Johanna Lambregts: Nothing to disclose
Regina G. H. Beets-Tan: Nothing to disclose
Nino Bogveradze: Nothing to disclose
Simon van Kranen: Nothing to disclose
Niels Schurink: Nothing to disclose

CTiR 4-5

Discussant of: Development and multicentre validation of a multiparametric imaging model to predict treatment response in rectal cancer
M. Reim; Tartu/EE

CTiR 4-6

Varying prognostic value of CT-derived CAD measures across ASCVD risk strata: insights from the PROMISE trial
B. Foldyna[1], T. Mayrhofer[2], M. T. Lu MD[1], J. Karady[1], M. Ferencik[3], S. Shah[4], N. Pagidipati[4], P. Douglas[4], U. Hoffmann[1]; [1]Boston, MA/US, [2]Stralsund/DE, [3]Portland, OR/US, [4]Durham, NC/US
(BFOLDYNA@mgh.harvard.edu)

Purpose: Coronary computed tomography angiography (CCTA) is a powerful tool to characterize coronary artery disease (CAD) in stable chest pain patients. However, the prognostic value of individual CT measures across cardiovascular risk categories is unknown.
Methods or Background: PROMISE patients with CCTA were classified to low (<7.5%) and elevated (≥7.5%) atherosclerotic cardiovascular disease (ASCVD) risk. Coronary artery calcium (CAC), stenosis≥50% (CAD≥50%), and vulnerable plaque (VP) were assessed by core lab. The primary endpoint was unstable angina pectoris, nonfatal myocardial infarction, or all-cause death (median F/U: 24 months).
Results or Findings: Of the 4,356 patients (age 61±8y, 52% women), 33% and 67% had ASCVD risk <7.5% and ≥7.5%, respectively. Patients with ASCVD≥7.5% were older (63 vs 55y, p<0.001), more often men (57% vs 30%, p<0.001), and had a higher event rate (3.5% vs 1.1%, p=0.002). In multivariate analysis, CAD≥50% was associated with events independently in both ASCVD categories with a substantially higher Hazard Ratio in the low ASCVD group (HR=8.5 vs 3.1, p=0.027 for difference). CAC was only related to events in ASCVD≥7.5% with a relatively low prognostic value (HR=1.9, p=0.045). In contrast, VP predicted events exclusively in patients with low ASCVD with a more robust HR (HR=3.1, p=0.034). Patients with ASCVD<7.5% and CAD≥50% had a 7.5x higher event rate compared to patients with ASCVD<7.5% and no/mild CAD (9.8% vs 1.3%, p<0.001).
Conclusion: Overall, CAD≥50% had the highest prognostic value in patients with stable chest pain, while VP and CAC were less predictive. Moreover, CAD≥50% was predictive regardless of ASCVD risk. In contrast, VP was only predictive in low risk and CAC only in high risk. These findings suggest that using CCTA rather than CAC in chest pain patients, including VP analysis in low-risk individuals, may better guide care.
Limitations: n/a
Ethics committee approval: Ethics committee approval was obtained.
Funding for this study: n/a
Author Disclosures:
Udo Hoffmann: Nothing to disclose
Pamela Douglas: Nothing to disclose
Thomas Mayrhofer: Nothing to disclose
Borek Foldyna: Nothing to disclose
Neha Pagidipati: Nothing to disclose
Maros Ferencik: Nothing to disclose
Julia Karady: Nothing to disclose
Michael T Lu MD: Nothing to disclose
Svati Shah: Nothing to disclose

CTiR 4-7

Discussant of: Varying prognostic value of CT-derived CAD measures across ASCVD risk strata: insights from the PROMISE trial
H. Alkadhi; Zurich/CH

CTiR 4-10

Fractal analysis of dynamic stress myocardial perfusion CT improves detection of obstructive coronary artery disease: a multicentre investigation
F. Michallek[1], M. Dewey[1], K. Kitagawa[2]; [1]Berlin/DE, [2]Tsu/JP
(florian.michallek@charite.de)

Purpose: Dynamic stress myocardial perfusion CT (CTP) complemented with CT angiography (CTA) has shown potential to improve diagnostic performance for non-invasive detection of hemodynamically significant coronary artery disease (CAD). However, myocardial blood flow (MBF) quantification from CT is impaired by suboptimal contrast agent kinetics. To mitigate this issue, we evaluated fractal analysis of CTP as a quantitative biomarker of perfusion chaos to further improve non-invasive CAD detection using combined CTP and CTA in a multicentre setting.
Methods or Background: Seven centres contributed CTP and CTA imaging in patients with suspected or known CAD and invasive coronary angiography (ICA) and fractional flow reserve (FFR) as reference standard. CAD was defined as ≥90% stenosis on ICA or FFR<0.8 and vessels with signs of infarction in the pertaining myocardium determined by CT delayed

enhancement imaging were excluded. We evaluated diagnostic performance of CTA combined with either CT-MBF or fractal analysis of CTP for detection of CAD.
Results or Findings: Our study population comprised 118 patients, thereof 61 patients with CAD (52%). Combining CTA and CT-MBF correctly identified 51 of 61 CAD patients and 40 of 57 non-CAD patients, whereas combining CTA and fractal analysis of CTP correctly identified 58 of 61 CAD patients and 51 of 57 non-CAD patients. We found a significant increase in diagnostic accuracy from 77% (CI:68-84%) for CTA+CT-MBF to 92% (CI:86-96%) for CTA+fractal analysis (p=0.02).
Conclusion: In a multicentre setting with invasive reference standard, fractal analysis of CTP constituted a pathophysiologically sound method for perfusion assessment and improved detection of CAD using dynamic stress CTP combined with CTA.
Limitations: PET-derived MBF to validate CT-MBF as competitor to fractal analysis was not available.
Ethics committee approval: Ethics committee approval was obtained.
Funding for this study: German Research Foundation (Deutsche Forschungsgemeinschaft, DFG), grant number 392304398 (MI 2272/1-1, DE 1361/18-1)
Author Disclosures:
Kakuya Kitagawa: Research/Grant Support: Support from Siemens Japan. Marc Dewey: Patent Holder: Patent jointly with Florian Michallek on perfusion analysis using fractal analysis (issued: USPTO 2021 10,991,109. pending: PCT/EP2016/071551). Research/Grant Support: Institutional research agreements: Siemens, General Electric, Philips, Canon. Author: Editor: Cardiac CT (Springer Nature). Other: Marc Dewey is European Society of Radiology (ESR) Research Chair (2019–2022) and the opinions expressed in this presentation are the author's own and do not represent the view of ESR. Grant Recipient: EU (603266-2) DFG (DE 1361/14-1, DE 1361/18-1, BIOQIC GRK 2260/1, Radiomics DE 1361/19-1 [428222922] and 20-1 [428223139] in SPP 2177/1), Berlin University Alliance (GC_SC_PC 27), Berlin Institute of Health (Digital Health Accelerator). Other: Other: Hands-on cardiac CT courses (www.ct-kurs.de)
Florian Michallek: Patent Holder: Patent jointly with Marc Dewey on perfusion analysis using fractal analysis (issued: USPTO 2021 10,991,109. pending: PCT/EP2016/071551). Grant Recipient: German Research Foundation (Deutsche Forschungsgemeinschaft, DFG), grant number: 392304398 (MI 2272/1-1)

CTiR 4-11

Discussant of: Fractal analysis of dynamic stress myocardial perfusion CT improves detection of obstructive coronary artery disease: a multicentre investigation
C. Loewe; Vienna/AT

CTiR 4-12

Addition of FFRct in the diagnostic pathway of patients with stable chest pain (FUSION): rationale and design of a multicentre randomised controlled trial
S. P. Sharma[1], A. Hirsch[1], M. G. M. Hunink[1], P. van der Harst[2], M-J. Cramer[2], T. Leiner[2], R. Vliegenthart[3], R. P. J. Budde[1]; [1]Rotterdam/NL, [2]Utrecht/NL, [3]Groningen/NL
(s.sharma@erasmusmc.nl)

Purpose: The purpose of the study is to investigate the impact of adding non-invasive Computed Tomography-derived Fractional Flow Reserve (FFRct) analysis in the diagnostic pathway of stable chest pain patients with coronary stenosis.
Methods or Background: Coronary Computed Tomography Angiography (CCTA) is widely used in the diagnostic work-up of stable chest pain. CCTA has an excellent negative, but moderate positive predictive value. FFRct is a non-invasive technique that uses anatomical CCTA information to calculate FFRct values at every point in the coronary tree and provide functional coronary stenosis assessment. FFRct is expected to improve the positive predictive value of CCTA. The FUSION study is a prospective, pragmatic, multicentre, randomised, controlled trial. In the trial, 528 stable chest pain patients with a CCTA-derived anatomical stenosis of 50-90% in ≥1 coronary artery of ≥2 mm will be randomized to FFRct-guided care or usual care in a 1:1 ratio. Follow-up will be 1 year. The primary endpoint is the rate of unnecessary invasive coronary angiography (ICA) within 90 days. Secondary endpoints include unnecessary ICA within one year, clinical outcomes, cost-effectiveness, and quality of life.
Results or Findings: The rate of unnecessary ICA will be compared between the FFRct and usual care group. Seven Dutch hospitals participate in the FUSION study, with more hospitals to be added in the future. Inclusion is currently ongoing.
Conclusion: We expect that the use of FFRct in stable chest pain patients will reduce the number of unnecessary ICA by approximately 30%.
Limitations: No limitations were identified.
Ethics committee approval: The study is approved by the medical ethics committee (Erasmus MC, MEC-2021-0189).
Funding for this study: Funded by the National Health Care Institute as part of the research program 'Promising Care' and Heartflow Inc..
Author Disclosures:
Ricardo P. J. Budde: Nothing to disclose
Pim van der Harst: Nothing to disclose
Alexander Hirsch: Nothing to disclose
Tim Leiner: Nothing to disclose
Simran Priyanka Sharma: Nothing to disclose
Rozemarijn Vliegenthart: Nothing to disclose
Myriam G. M. Hunink: Nothing to disclose
Maarten-Jan Cramer: Nothing to disclose

CTiR 4-13

Discussant of: Addition of FFRct in the Diagnostic Pathway of Patients with Stable Chest Pain (FUSION): rationale and design of a multicentre randomised controlled trial
M. Pirnat; Maribor/SI

13:00-14:30 **Room K**

E³ - Advanced Courses: Gynaecology/Genitourinary Imaging

E³ 432

Prostate cancer: a multidisciplinary approach

E³ 432-1

Chairperson's introduction
A. R. Padhani; London/UK
(anwar.padhani@talk21.com)

Learning Objectives:
1. To describe the potential clinical benefits of metastasis-directed therapies (MDT) for oligometastatic prostate cancer (OMPC) according to the castration state.
2. To learn how NGI alters OMPC states in prostate cancer and how the NGI modality/tracer affects the test accuracy.
3. To understand how test performance can affect the strategy of MDT including follow-up.
4. To realise the need for better evidence on the management impacts of NGI (inherent test inaccuracies, stage-migration, and survival biases).
Author Disclosures:
Anwar R. Padhani: Advisory Board: Siemens Healthineers

E³ 432-2

Oligometastatic prostate cancer (OMPC): opportunities for advancing care
T. Zilli; Geneva/CH
(thomas.zilli@hcuge.ch)

Learning Objectives:
1. To define the OMPC status in the prostate cancer landscape.
2. To understand the potential role of metastasis-directed therapies (MDT) in the different disease settings and describe available clinical evidence.
3. To provide insights on the future clinical directions of MDT strategies for OMPC.
Author Disclosures:
Thomas Zilli: Advisory Board: Janssen; Board Member: SAKK, GFRU; Grant recepient: Varian Medical Systems, Debiopharm; Speaker: Janssen, Amgen, Ferring, Debiopharm, Bayer, Astellas; Other: Honoraria payed to the institution

E³ 432-3

Conventional versus next-generation imaging for detecting and directing MDT
I. A. Burger; Zurich/CH

Learning Objectives:
1. To explore the currently available tools for targeted prostate cancer imaging and when they should be applied.
2. To learn if there is a role for bone scans for therapy selection.

3. To understand if there is a role for PSMA-targeted radiotherapy in oligometastatic patients.
Author Disclosures:
Irene A. Burger: Advisory Board: GE-Healthcare, AAA (Novartis), Merck; Research Grant/Support: GE-Healthcare, Bayer; Speaker: GE-Healthcare, Bayer, Astellas, Janssen

E³ 432-4
Pokemets, biases, and follow-up after MDT
S. Fanti; Bologna/IT
(stefano.fanti@aosp.bo.it)

Learning Objectives:
1. To understand the fundamental importance of detecting a few more hot spots (the Pokemets concept).
2. To learn if there is data about the impact of PSMA PET on major clinical objectives.
3. To discuss if PSMA PET can be used to evaluate response to therapy.
Author Disclosures:
Stefano Fanti: Advisory Board: many

E³ 432-5
Multidisciplinary tumour board: case-based panel discussion
A. R. Padhani; London/UK
(anwar.padhani@talk21.com)
Author Disclosures:
Anwar R. Padhani: Advisory Board: Siemens Healthineers

13:00-14:30 **Room N**

Special Focus Session

SF 4b
Subtle findings in emergency radiology: we have to be alert to recognise

SF 4b-1
Chairperson's introduction
M. Scaglione; Castel Volturno/IT

SF 4b-2
Subtle findings in emergency neuroradiology
T. Das; Cambridge/UK
(tilak.das@addenbrookes.nhs.uk)

Learning Objectives:
1. To apply a systematic approach to examining 'review areas' in brain and spine imaging.
2. To identify and analyse uncommon or subtle pathological findings on brain and spine images that suggest an underlying abnormality.
3. To select the most suitable next step, imaging or otherwise, to recommend to referring clinicians in order to facilitate appropriate management for their patient.

SF 4b-3
Subtle imaging findings in chest emergencies
P. Franchi; Teramo/IT
(paegiodi@hotmail.com)

Learning Objectives:
1. To identify common and uncommon imaging findings in chest emergencies.
2. To optimise imaging protocols for the recognition of subtle findings suggesting diagnosis.
3. To reflect on how the identification of subtle imaging findings could change patient management and outcome.

SF 4b-4
Subtle imaging findings in abdominal emergencies
I. Millet; Montpellier/FR
(milletingrid@wanadoo.fr)

Learning Objectives:
1. To describe the relevant CT findings suggestive of ischaemia in bowel obstruction.
2. To learn to diagnose gangrenous ischaemic colitis.
3. To identify the perforation site when there is a pneumoperitoneum of unknown cause.

Panel discussion: Which subtle imaging findings are helpful and how can imaging protocols be optimised?

13:00-14:30 **Room O**

Professional Challenges Session

PC 4
The sustainable imaging department

PC 4-1
Chairpersons' introduction: the circle is round
P. A. de Jong; Utrecht/NL

PC 4-2
Reducing costs in imaging acquisition
A. Webb; Leiden/NL
(a.webb@lumc.nl)

Learning Objectives:
1. To outline the main costs associated with installation, operation, and maintenance of an MRI system.
2. To identify the areas in which lower-field MRI can reduce these costs.
3. To describe the pros and cons of low-field MRI in the clinic.

PC 4-3
Reducing energy consumption in radiology reporting practice
W. C. G. Peh; Singapore/SG
(wilfred.peh@gmail.com)

Learning Objectives:
1. To learn how to reduce the power consumption of PACS reporting workstations and computers.
2. To appreciate the advantages of using LED lamps over incandescent bulbs in reporting rooms.
3. To name the ways of reducing paper consumption during radiology reporting practice.

PC 4-4
Reducing waste in diagnostic and interventional radiology
J. E. Wildberger; Maastricht/NL

Learning Objectives:
1. To understand the different types of waste according to the acronym "DOWNTIME".
2. To be able to perceive waste in daily practice by changing the classical perspective.
3. To reflect on how to improve sustainability within (interventional) radiology.
Author Disclosures:
Joachim E. Wildberger: Grant recepient: Institutional (via Clinical Trial Center Maastricht): Agfa, Bard, Bayer, Cook, GE, Optimed, Philips, Radiomics, Siemens.; Speaker: Speaker's Bureau (via Maastricht UMC+): Bayer, Siemens

PC 4-5
The sustainable employee: the search for high-performing teams in radiology through radiographers
E. Bonnema; Utrecht/NL
(E.Bonnema@umcutrecht.nl)

Learning Objectives:
1. To understand the importance of identifying and using the (hidden) talents of radiographers.
2. To learn how to use radiographers to create high-performing teams in radiology.
3. To describe ways to involve radiographers to create a more interdisciplinary radiology department.

Panel discussion: Triple-P bottom line in the imaging department

13:00-14:30 **Room Z**

Special Focus Session

SF 4a

Normal variants and diagnostic errors in child abuse: you can never know too much

SF 4a-1
Chairperson's introduction
A. C. Offiah; Sheffield/UK

SF 4a-2
Unusual suspects part 1: mimickers of abusive head trauma
C. Drissi; Le Kremlin-Bicêtre/FR

Learning Objectives:
1. To revise the main imaging features of abusive head trauma.
2. To discuss in a step-by-step fashion the differential diagnosis and pitfalls.
3. To highlight key mimickers of abusive head trauma.

SF 4a-3
Unusual suspects part 2: mimickers of inflicted skeletal injury
M. Raissaki; Iraklion/GR
(mraissaki@yahoo.gr)

Learning Objectives:
1. To revise the main imaging features of fractures with high and moderate specificity for inflicted skeletal injury.
2. To summarise the major normal variants that may mimic fractures.
3. To highlight key mimickers of inflicted skeletal injury.

SF 4a-4
What's in a name? Nomenclature of abusive trauma
I. Barber; Esplugues de Llobregat/ES
(ibarber@hsjdbcn.org)

Learning Objectives:
1. To understand the controversy regarding the nomenclature in the field of child abuse radiology.
2. To appreciate the key child abuse and neglect definitions.
3. To recognise misnomers or misleading terms in child abuse and their significance in clinical, forensic, and legal settings.

SF 4a-5
When and why we use CT or MRI in suspected inflicted trauma
R. R. van Rijn; Amsterdam/NL

Learning Objectives:
1. To understand the need for proper and timely imaging in the context of suspected child abuse.
2. To learn about the current guidelines in imaging in suspected child abuse.
3. To appreciate the limitations of CT and MRI imaging in suspected child abuse.

Author Disclosures:
Rick R. van Rijn: Author: Forensic Aspects of Paediatric Fractures - Springer

Panel discussion: Multidisciplinary assessment of the child and siblings: who, when, and how?

15:00-16:00 **Open Forum #1 (Radiographers)**

EuroSafe Imaging Session

Organised by EuroSafe Imaging

EU 5

European consensus on gonad and patient shielding: the GAPS group – can we come to our consensus?

EU 5-1
Chairperson's introduction
P. Gilligan; Dublin/IE

EU 5-2
Current practice in Europe
M. Sans Merce; Geneva/CH
(marta.sansmerce@hcuge.ch)

Learning Objectives:
1. To learn about current regulations and practice.
2. To appreciate the need for consistency.
3. To understand how that can be delivered.

EU 5-3
The GAPS statement
P. Hiles; Wales/UK
(Peter.Hiles@wales.nhs.uk)

Learning Objectives:
1. To learn the recommendations for different types of shielding.
2. To appreciate the rationale behind the recommendations.
3. To understand the next steps in delivery.

EU 5-4
Current European practice of shielding in paediatric radiology
C. Granata; Genoa/IT

Learning Objectives:
1. To learn the challenges for the statement in paeditaric radiology.
2. To appreciate the results of the recent survey.
3. To understand the steps needed to bring it into practice in children.

EU 5-5
The role of the radiographer in shielding
S. J. Foley; Dublin/IE
(shane.foley@ucd.ie)

Learning Objectives:
1. To learn the role of the radiographer in implementing a shielding policy.
2. To appreciate the challenges involved.
3. To understand the next steps.

EU 5-6
Shielding: the patient's viewpoint
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To learn what the patient needs to know and understand.
2. To appreciate the challenges involved.
3. To understand the next steps.

Panel discussion: Patient shielding: can we come to our consensus?

15:00-16:00 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 5Y

Career paths: clinical radiology

Moderator
M. Becker; Geneva/CH

Learning Objectives:
Part of a series of sessions dedicated to exploring different career paths in radiology. In this session, speakers devoted to clinical radiology working in large regional hospitals and private practice will share their experience and will answer questions. As this is the first session of the series, a talk dedicated to the European Training Curriculum for subspecialisation in radiology will also be presented.

OF 5Y-2
Impact of the radiologist on clinical decision making
M. Becker; Geneva/CH

OF 5Y-3
Clinical radiology in a busy ultrasound department
D. D. Cokkinos; Athens/GR
(demoscokkinos@gmail.com)

OF 5Y-4
A busy paediatric ultrasound unit
M. Laurent; Geneva/CH
(Meryle.Laurent@hcuge.ch)

OF 5Y-5
Radiologist's role in the acute emergency (AE) department
M. Scheerder; Amsterdam/NL
(m.j.scheerder@amsterdamumc.nl)

Discussion

15:00-16:00 **Open Forum #3 (ESR)**

Open Forum Session

Organised by the ESR Quality, Safety and Standards Committee

OF 5a

The relevance of the ESR Quality, Safety and Standards Committee (QSSC) in radiology practice

Moderator
N. Bargalló; Barcelona/ES

Learning Objectives:
This session will explain the structure of the Quality, Safety and Standards Committee (QSSC) and demonstrate the goals and the activities of the Audits and Standards, eHealth and Informatics, Ultrasound, and Radiation Protection subcommittees and their impact on radiology practice.

OF 5a-2
Audits and Standards Subcommittee
D. C. Howlett; Eastbourne/UK
(david.howlett@nhs.net)

OF 5a-3
eHealth and Informatics Subcommittee
E. Kotter; Freiburg/DE
Author Disclosures:
Elmar Kotter: Advisory Board: Contextflow; Speaker: Siemens Healthineers, AbbVie

OF 5a-4
Ultrasound Subcommittee
P. Ricci; Rome/IT
(paolo.ricci@uniroma1.it)

OF 5a-5
Radiation Protection Subcommittee
F. Kainberger; Vienna/AT
Author Disclosures:
Franz Kainberger: Speaker: IBSA Institut Biochimique SA

Panel discussion: The impact of the QSSC activities in our clinical practice: what is next?

15:00-16:00 **Open Forum #4 (ESR)**

Open Forum Session

Jointly organised by the ESR and EIBIR

OF 5b

New directions in preclinical molecular imaging

OF 5b-1
Chairperson's introduction
S. Aime; Turin/IT

OF 5b-2
Role of intracellular water lifetime as a tumour biomarker detectable by "in vivo" fast-field cycling relaxometry
S. Geninatti; Turin/IT
(simonetta.geninatti@unito.it)

Learning Objectives:
1. To learn how to measure the water exchange rate through intra-extracellular compartments by relaxometry.
2. To appreciate how R1 measured at low fields is related to tumour metabolism.
3. To understand how to exploit water dynamic as a new tumour biomarker.

OF 5b-3
The multiple dimensions of state-of-the-art optoacoustic imaging
V. Ntziachristos; Munich/DE

Learning Objectives:
1. To learn about the basis of multispectral optoacoustic imaging.
2. To become aware of the different contrast mechanisms.
3. To understand the preclinical and clinical potential of MSOT.

OF 5b-4
EIBIR activities and upcoming funding opportunities
K. Krischak; Vienna/AT

Learning Objectives:
1. To learn about EIBIR activities and support services.
2. To understand how EIBIR can increase funding success.
3. To become familiar with European research funding opportunities, in particular, Horizon Europe.

Discussion

15:00-16:00 **Room B**

Refresher Course: Cardiac

RC 503

Cardiac CT for the non-cardiac radiologist: why every radiologist should be cardiac capable

RC 503-1
Chairperson's introduction
I. Zuza; Rijeka/HR

RC 503-2
Current guidelines and implications for radiology practice
K. Gruszczynska; Katowice/PL
(kgruszczynska@poczta.onet.pl)

Learning Objectives:
1. To understand the need for guidelines in clinical practice.
2. To learn about the current position of cardiac CT in selected guidelines.
3. To follow the guidelines and recommendations through web resources.

RC 503-3
Technical requirements and procedural practice
M. Pirnat; Maribor/SI

Learning Objectives:
1. To understand the system requirements for a cardiac CT scan.
2. To become familiar with CT protocols.
3. To become familiar with the factors that influence the quality of the scan.
Author Disclosures:
Maja Pirnat: Advisory Board: Bayer

RC 503-4
Image analysis: how to interpret cardiac CT and what is important
F. A. A. Mohamed Hoesein; Utrecht/NL
(fmohamedhoesein@gmail.com)

Learning Objectives:
1. To learn how to achieve a good image quality in cardiac CT and why it is important.
2. To understand what is mandatory to analyse and report in cardiac CT.
3. To understand what is optional to evaluate in cardiac CT.

Panel discussion: Will this become a routine imaging investigation that every radiologist can do?

15:00-16:00 **Room D**

Refresher Course: Breast

RC 502

Pros and Cons: Intermediate risk screening should be done with breast MRI and not with contrast-enhanced mammography

RC 502-1
Chairperson's introduction
T. H. Helbich; Vienna/AT
Author Disclosures:
Thomas H. Helbich: Advisory Board: bayer, guerbet; Grant recepient: bard, guerbet, siemens, hologic, bracco, novomed, bruker

RC 502-2
PRO
R. M. Mann; Nijmegen/NL
(r.mann@rad.umcn.nl)

Learning Objectives:
This house believes that intermediate risk screening should be done with breast MRI and not with contrast-enhanced mammography.
Author Disclosures:
Ritse M. Mann: Advisory Board: Screenpoint, BD, Bayer, Siemens; Board Member: EUSOBI

RC 502-3
CON
M. B. I. Lobbes; Maastricht/NL
(marc.lobbes@mumc.nl)

Learning Objectives:
This house believes that intermediate risk screening should NOT be done with breast MRI but with contrast-enhanced mammography.
Author Disclosures:
Marc B.I. Lobbes: Advisory Board: GE Healthcare, Hologic, Bayer, Guerbet; Grant recepient: GE Healthcare; Speaker: GE Healthcare, Tromp Medical, Bayer, Guerbet

Panel discussion: Will we need to use contrast agents in screening?

15:00-16:00 **Room E2**

Refresher Course: Imaging Informatics / Artificial Intelligence and Machine Learning

RC 505

The 3 laws of robotics applied to artificial intelligence (AI) in radiology

RC 505-1
Chairperson's introduction
F. Zanca; Leuven/BE

RC 505-2
AI may not injure a human being or, through inaction, allow a human being to come to harm
A. Dekker; Maastricht/NL
(andre.dekker@maastro.nl)

Learning Objectives:
1. To learn about AI models creation strategies including the human in the loop.
2. To discover ways in which AI could lead to medical negligence of the radiologist.
3. To learn how to create stepwise AI models with quality checkpoints.
Author Disclosures:
Andre Dekker: Advisory Board: Hanarth Fund | Peter Munk Foundation | MD Anderson; Founder: Medical Data Works B.V.; Research Grant/Support: Varian | Philips | Janssen | BMS; Speaker: Roche | Medtronic | Janssen

RC 505-3
AI must obey the orders given it by human beings except where such orders would conflict with the First Law
G. d'Assignies; Rénnes/FR
(gdassignies@gmail.com)

Learning Objectives:
1. To discover how radiologists should be able to accept, amend, or reject AI outputs.
2. To understand how humans can interact with AI to make the work better on a daily basis.
3. To learn about the roles that radiologists can undertake in the development of AI models.
Author Disclosures:
Gaspard d'Assignies: Founder: Incepto medical

RC 505-4
AI must protect its own existence as long as such protection does not conflict with the First or Second Laws
J. Teuwen; Nijmegen/NL
(j.teuwen@nki.nl)

Learning Objectives:
1. To learn how to focus AI models creation in maximising the clinical impact.
2. To review examples of AI integration in highly demanding environments.
3. To understand the current developments in AI modelling and future directions in healthcare.

Panel discussion: AI may not harm humanity, or, by inaction, allow humanity to come to harm

15:00-16:00 **Room F1**

Refresher Course: Oncologic Imaging

RC 516

Ovarian cancer: where are we now?

RC 516-1
Chairperson's introduction
R. Forstner; Salzburg/AT

RC 516-2
Radiologic impact on surgery management in ovarian cancer
S. Rizzo; Lugano/CH
(Stefania.rizzo@eoc.ch)

Learning Objectives:
1. To list the appropriate imaging modalities and protocols.
2. To name and identify the sites of peritoneal carcinomatosis.
3. To summarise the information needed by surgeons in a structured report.

RC 516-3
FDG-PET in ovarian cancer
H. A. Vargas; New York, NY/US

Learning Objectives:
1. To understand the principles of FDG PET/CT as applied to ovarian cancer and to learn about the ovarian cancer clinical states in which FDG PET/CT demonstrates utility.
2. To discuss the role of PET/CT compared with other modalities used in ovarian cancer detection including CT and MRI.
3. To introduce novel uses of PET/CT including new imaging probes, machine learning, and artificial intelligence.

RC 516-4
Radiomics promises in ovarian cancer management
E. Sala; Cambridge/UK

Learning Objectives:
1. To illustrate the limitations of conventional imaging in the evaluation of treatment response and phenotypic heterogeneity in ovarian cancer.
2. To discuss the role of radiomics in unravelling tumour heterogeneity and predicting platinum resistance.
3. To understand the role of multi-omics data integration in refining treatment response assessment and outcome prediction.

Panel discussion: What is the future of imaging ovarian cancer?

15:00-16:00 **Room N**

ISRRT meets the United States

Meets 5

Collaborative radiographer research: preserving radiographer's history and evolving radiation therapy professional role in the United States

Presiding
H. H. Hjemly; Oslo/NO
K. Moore; Jackson, MS/US

Moderators
E. Agadakos; Athens/GR
H. H. Hjemly; Oslo/NO

Meets 5-2
Introduction
D. Newman; Fargo, ND/US
K. Moore; Jackson, MS/US
(kmoore@asrt.org)
Author Disclosures:
Kristi Moore: Board Member: American Society of Radiologic Technologists

Meets 5-3
The ASRT museum and archives: preserving the history of radiographers in the United States
M. Pergola; Albuquerque, NM/US
(mpergola@asrt.org)

Learning Objectives:
1. To take participants on a virtual tour of the ASRT museum and archives, highlighting its interactive displays and educational exhibits.
2. To review the unique mission of the museum to deepen the appreciation and understanding of the radiographer profession and to inspire further learning.
3. To identify the major milestones in the development of radiographers' practice in the US that is presented in the museum.
4. To learn about ASRT's significant and vital role in advancing the radiographer profession in the US.

Meets 5-4
Supporting radiographers' research efforts in the USA and internationally
K. Moore; Jackson, MS/US
(kmoore@asrt.org)

Learning Objectives:
1. To outline the efforts of the ASRT foundation in funding research grants in the US.
2. To describe the ASRT foundation's pilot program for funding collaborative international research projects.
3. To appreciate how radiographer-directed research enhances the entire profession.
4. To explain the importance of supporting a continuum of research grant opportunities at all experience levels; new, emerging, and seasoned researchers.
Author Disclosures:
Kristi Moore: Board Member: American Society of Radiologic Technologists

Meets 5-5
The evolving role of the radiation therapist in the United States
S. Hardy; Albuquerque, NM/US

Learning Objectives:
1. To identify recent advances in radiation therapy equipment and practice that have caused the role of the radiation therapist to evolve in the US.
2. To discuss the changes in educational preparation of the radiation therapist with evolving technology and practice.
3. To recognise how advances in radiation therapy equipment and practice affects patient outcomes and demands on the health care system in the US.
4. To evaluate the future practice changes in radiation therapy that will influence the role of the radiation therapist.

Panel discussion: Evolving roles in medical imaging and how to support national and international radiographer research efforts

15:00-16:00 **Room O**

Refresher Course: Paediatric

RC 512

Polytrauma management

RC 512-1
Chairperson's introduction
G. Perucca; London/UK

RC 512-2
CT in paediatric polytrauma
M. Raissaki; Iraklion/GR
(mraissaki@yahoo.gr)

Learning Objectives:
1. To discuss the justification for CT imaging in paediatric polytrauma patients.
2. To learn about the imaging protocols and current guidelines in paediatric polytrauma management.
3. To discuss the potential applications and limitations of split bolus protocol in paediatric polytrauma patients.

RC 512-3
The role of contrast-enhanced ultrasound (CEUS) in paediatric polytrauma management
M. Galluzzo; Rome/IT
(mgalluzzo@scamilloforlanini.rm.it)

Learning Objectives:
1. To discuss the indications of CEUS in paediatric polytrauma.
2. To learn about the technique for CEUS in the trauma setting.
3. To become familiar with the imaging findings on CEUS in solid organ injury.

RC 512-4
How traumatic injuries differ in children compared to adults
O. Kvist; Stockholm/SE
(ola.kvist@sll.se)

Learning Objectives:
1. To learn about the imaging patterns of neurological, thoracic, and abdominal trauma in children.
2. To discuss the most important differences compared to adult patterns.
3. To become familiar with the pitfalls in paediatric polytrauma imaging.

Panel discussion: The role of paediatric radiologists in polytrauma management

16:30-17:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 6Y

Career paths: open your eyes, radiology outside the clinics

OF 6Y-1
Chairpersons' introduction
S. Afat; Tübingen/DE
M. Reim; Tartu/EE
Author Disclosures:
Martin Reim: Board Member: Estonian Society of Radiology; Employee: Tartu University Hospital; Founder: Better Medicine OÜ; Share Holder: Better Medicine OU, Pfizer Corporation

OF 6Y-2
Are we lost to private equity?
M. Notohamiprodjo; Tübingen/DE
(Mike.Notohamiprodjo@die-radiologie.de)

Learning Objectives:
1. To learn about the possibilities of working and being a partner in a large practice group.
2. To learn about the options for radiologists outside the clinical routine.
3. To define the steps in investing in radiological start-ups.
Author Disclosures:
Mike Notohamiprodjo: Advisory Board: Mediaire GmbH, Easy Radiology AG; CEO: Centaurus ER GmbH

OF 6Y-3
Co-founding a global web (collaboration) platform and clinic
L. K. Blomqvist; Stockholm/SE

Learning Objectives:
1. To explain how to be a co-founder of a start-up outside of just the clinical work.
2. To identify the first steps from brainstorming to running a company.
3. To discuss the difficulties in running a start-up with an international team.
Author Disclosures:
Lennart K. Blomqvist: Founder: Collective Minds Radiology; Share Holder: Collective Minds Radiology

OF 6Y-4
Artificial intelligence (AI) start-up and clinic
T. Lindig; Tübingen/DE

Learning Objectives:
1. To explain how to scale up AI tools from research to a product.
2. To learn about funding possibilities and finding investors.
3. To describe the difficulties of working in the clinic while running a start-up with 10 or more employees.
Author Disclosures:
Tobias Lindig: CEO: AIRAmed; Employee: AIRAmed; Founder: AIRAmed

Discussion

16:30-17:30 **Room B**

Refresher Course: Abdominal Viscera

RC 601

Abdominal MRI: faster and better with DWI-MRI

RC 601-1
Chairperson's introduction
D.-M. Koh; Sutton/UK
(dowmukoh@icr.ac.uk)
Author Disclosures:
Dow-Mu Koh: Founder: Co-founder of Celescan; Research Grant/Support: NIHR Invention for innovation challenge award

RC 601-2
Faster MRI sequences: the need for abbreviated protocols and how to do it
B. Taouli; New York, NY/US
(bachir.taouli@mountsinai.org)

Learning Objectives:
1. To learn how to make your abdominal MRI protocols faster.
2. To become familiar with abbreviated abdominal MRI protocols.
3. To discuss the role of MRI technicians in the clinical application of DWI.
Author Disclosures:
Bachir Taouli: Grant recepient: Bayer, Takeda, Regeneron

RC 601-3
Diffusion weighted MRI in abdominal disease: clinical practice
D. M. Lambregts; Amsterdam/NL
(doenja.lambregts@gmail.com)

Learning Objectives:
1. To learn how to perform a dedicated DWI sequence in the abdomen.
2. To appreciate the role of diffusion imaging in abdominal disease.
3. To become familiar with the clinical applications of DWI in abdominal disease.

RC 601-4
Whole-body MRI protocol in oncology patients: this is how to do it
V. Vandecaveye; Leuven/BE
(vincent.vandecaveye@uzleuven.be)

Learning Objectives:
1. To learn how to perform a dedicated whole-body MRI protocol in oncology patients.
2. To appreciate the role of diffusion imaging in oncology imaging.
3. To discuss the clinical application of whole-body MR imaging in oncology patients.

Panel discussion: Is faster better, or good the enemy of great?

16:30-17:30 **Room C**

Refresher Course: Genitourinary

RC 607

Pros and Cons: Contrast-medium administration for prostate MRI can be abandoned

RC 607-1
Chairperson's introduction
G. M. Villeirs; Ghent/BE

RC 607-2
PRO
P. Asbach; Berlin/DE
(patrick.asbach@charite.de)

Learning Objectives:
This house believes that contrast-medium administration for prostate MRI can be abandoned.
Author Disclosures:
Patrick Asbach: Equipment Support Recepient: Siemens Healthineers, Canon Medical Systems, Bayer AG; Grant recepient: DFG (SFB 1340/1-2); Investigator: I do research on Gadolinium-deposition; Speaker: b.e. imaging; Other: Editor: European Journal of Radiology (Elsevier)

RC 607-3
CON
A. R. Padhani; London/UK
(anwar.padhani@talk21.com)

Learning Objectives:
This house believes that contrast-medium administration for prostate MRI can NOT be abandoned.
Author Disclosures:
Anwar R. Padhani: Advisory Board: Siemens Healthineers

Panel discussion: Will biparamteric MRI replace multiparametric MRI in the near future?

16:30-17:30 **Room D**

Transatlantic Course of ESR and RSNA (Radiological Society of North America): Breast Cancer Imaging

TC 6

Screening, early detection, organisational issues, and differences between countries

Moderators
R. M. Pijnappel; Utrecht/NL
E. A. Morris; Sacramento, CA/US

TC 6-3
B. Screening in the US and how risk strategies for screening differ between the US and Europe
D. Monticciolo; Temple, TX/US

Learning Objectives:
1. To understand the basis for the US screening recommendations from the American College of Radiology.
2. To understand the approach to age and interval in breast cancer screening in the US.
3. To understand the effects of diversity and inclusion in informing the latest 2021 guideline update from the ACR/SBI in the US.

TC 6-4
C. Digital breast tomosynthesis and AI in screening
E. Conant; Philadelphia, PA/US
(Emily.Conant@pennmedicine.upenn.edu)

Learning Objectives:
1. To compare outcomes of breast cancer screening with digital mammography alone (DM) vs screening with digital breast tomosynthesis (DBT).
2. To assess breast cancer screening efficacy by patient age, breast density, and screening round of DM vs DBT screening.
3. To describe applications of artificial intelligence (AI) in the interpretation of DBT screening studies.
Author Disclosures:
Emily Conant: Advisory Board: iCAD, Inc.; Hologic, Inc.; Research Grant/Support: iCAD, Inc.; OM1; Hologic, Inc.; Speaker: iCAD, Inc.

16:30-17:30 **Room G**

Refresher Course: Emergency Imaging

RC 617

Pros and Cons: Artificial intelligence in the emergency department is helpful

RC 617-1
Chairperson's introduction
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)
Author Disclosures:
Emanuele Neri: Speaker: GE /Healthcare - ESAOTE-Ebit - Bayer

RC 617-2
PRO
A. Agrawal; Delhi/IN
(anjali.agrawal@telradsol.com)

Learning Objectives:
This house believes that artificial intelligence in the emergency department is helpful.

RC 617-3
CON
E. Dick; London/UK
(elizabethdick2010@gmail.com)

Learning Objectives:
This house believes that artificial intelligence in the emergency department is NOT helpful.

Panel discussion: What will the impact of artificial intelligence in emergency radiology be in the near future and how can artificial intelligence improve patient triage?

16:30-17:30 **Room M 4**

McKinsey & Company Session

Jointly organised by the ESR and McKinsey & Company

McKinsey

Real-world evidence (RWE) in life sciences: a roundtable discussion on the role of imaging

Moderator
A. Karmann; San Francisco, CA/US

Learning Objectives:
1. To learn about the emerging role of RWE in life sciences and sources of real-world data.
2. To understand the opportunities of RWE in drug development and clinical research, and challenges to date.
3. To discuss the future role of imaging to advance the use and benefit of RWE.

McKinsey-2
An outside-in perspective
A. Karmann; San Francisco, CA/US
(Anna_Karmann@mckinsey.com)

McKinsey-3
The next frontier in drug development
B. Vannieuwenhuyse; Beerse/BE
(BVANNIEU@its.jnj.com)

McKinsey-4
Experiences from melanoma treatment
M. Wouters; Amsterdam/NL

McKinsey-5
Roundtable and podium discussion on the role of imaging and radiologists for RWE
A. Karmann; San Francisco, CA/US
B. Vannieuwenhuyse; Beerse/BE
(BVANNIEU@its.jnj.com)
M. Wouters; Amsterdam/NL
J. J. Visser; Rotterdam/NL
(j.j.visser@erasmusmc.nl)
H.-C. Becker; Stanford, CA/US
Author Disclosures:
Jacob J. Visser: Advisory Board: Contextflow, Quibim

16:30-17:30 **Room N**

Refresher Course: Paediatric

RC 612

Learning from errors and discrepancies in paediatric radiology

RC 612-1
Chairperson's introduction
G. Roić; Zagreb/HR

RC 612-2
Pitfalls to avoid when imaging children with tumours
K. McHugh; London/UK

Learning Objectives:
1. To understand how learning from mistakes improves clinical care.
2. To review the potential pitfalls in oncology imaging.
3. To learn how to optimise the added value of diagnostic radiology.

RC 612-3
Pitfalls to avoid when imaging the neonatal brain
M. I. Argyropoulou; Ioannina/GR
(margyrop@uoi.gr)

Learning Objectives:
1. To understand how learning from mistakes improves clinical care.
2. To review the common pitfalls in neonatal neuroimaging.
3. To learn how to avoid confusing physiology with pathology.

RC 612-4
Pitfalls to avoid in paediatric abdominal imaging
S. Franchi-Abella; Le Kremlin-Bicêtre/FR
(stephanie.franchi@aphp.fr)

Learning Objectives:
1. To understand how optimising ultrasound settings improves clinical care.
2. To review the common pitfalls in abdominal ultrasound in children, including normal variants.
3. To learn how to optimise abdominal Doppler settings and interpretations in children to avoid pitfalls.

Panel discussion: Should radiologists refuse to report investigations that are accompanied by blank request cards?

16:30-17:30 **Room O**

Refresher Course: Neuro

RC 611

Around the brain lesions in neuroimaging

RC 611-1
Chairperson's introduction
P. Vilela; Almada/PT

RC 611-2
Incidental and the most common lesions of the orbit
D. Hedderich; Munich/DE
(dennis.hedderich@tum.de)

Learning Objectives:
1. To learn about the variations of normal anatomy in the orbit.
2. To learn about the most common lesions in the orbit.
3. To understand when additional investigation and/or follow-up is needed for incidental orbital findings.

RC 611-3
Incidental and the most common lesions of temporal bone
A. Borges; Lisbon/PT
(borgalexandra@gmail.com)

Learning Objectives:
1. To be able to name and identify the most common temporal bone incidental findings.
2. To learn about the clinical significance and how to orient further management of incidental findings.
3. To diagnose the three most common inflammatory lesions of the temporal bone.

RC 611-4
Incidental aneurysm: when and how to follow-up
P. Vilela; Almada/PT
(ferrovilela@sapo.pt)

Learning Objectives:
1. To categorise intracranial aneurysms and learn about their natural history.
2. To select the best imaging option for aneurysm detection and follow-up.
3. To report the most important imaging features of intracranial aneurysms with treatment significance.

Panel discussion: Extracranial lesions we must not miss in a brain exam

16:30-17:30 **Room X**

Lancet Commission Session

Lancet
The Lancet Commission on diagnostics

Lancet-1
Chairpersons' introduction
L. Donoso; Barcelona/ES
K. Fleming; Oxford/UK

Lancet-2
The Lancet Commissions
S. Kleinert; London/UK
(Sabine.Kleinert@lancet.com)

Learning Objectives:
1. To understand the purpose of a Lancet Commission.
2. To become familiar with the process of putting a commission together up to publication.
3. To learn about the potential afterlife of commissions using current examples.

Lancet-3
The challenges of access and the impact on health, economy, and equity across countries
S. Horton; Waterloo, ON/CA
(sehorton@uwaterloo.ca)

Learning Objectives:
1. To understand the challenges that affect access.
2. To understand the challenges that affect equity.
3. To become familiar with the economic impacts.

Lancet-4
Key needs: opportunities for using new technology
M. Wilson; Denver, CO/US
(Michael.Wilson@dhha.org)

Learning Objectives:
1. To understand the opportunities and potential impact of digitisation, including both telehealth and artificial/augmented intelligence.
2. To understand the opportunities and potential impact of increased use of Point of Care testing and imaging.
3. To understand the opportunities and potential impact of the democratisation of diagnostics.

Lancet-5
The radiologist's point of view
K. DeStigter; Burlington, VT/US

Learning Objectives:
1. To discuss the role of radiology in addressing the global burden of disease.
2. To identify the gaps in radiology service delivery, including workforce, technology, infrastructure, and quality management.
3. To discuss how radiologists can collaborate to promote visibility, innovation, and transformation.

Lancet-6
The Lancet Commission's recommendations for an international community
K. Fleming; Oxford/UK
(kenneth.fleming@icloud.com)

Learning Objectives:
1. To review the critical importance and means of advocacy for diagnostics.
2. To understand the role and objectives of an International Diagnostics Alliance.
3. To become familiar with the need to improve affordability of diagnostics and possible mechanisms.

Panel discussion: Are we really advancing equitable access to diagnostics?

Thursday, July 14

08:00-09:00 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 7R
The EFRS patient-centred care awards

Moderator
A. England; Cork/IE

Learning Objectives:
1. To describe the approach to, and importance of, the EFRS patient-centred care awards.
2. To demonstrate the work being undertaken by the 2021 award recipients to enhance patient care in their centres.

OF 7R-2
Shining a light on our patients: the EFRS perspective
A. England; Cork/IE
(aengland@ucc.ie)
Author Disclosures:
Andrew England: Board Member: European Federation of Radiographer Societies (EFRS)

OF 7R-3
Shining a light on our patients: the patient perspective
C. Cruwys; Glanges/FR

OF 7R-4
EFRS patient-centred care award showcase: introduction
C. Beardmore; London/UK
(CharlotteB@sor.org)

OF 7R-5
Runner-up: malignant spinal cord compression pathway
C. Buchan; Wakefield/UK

OF 7R-6
Winner: mobile x-ray for patients with dementia
P. Blackburn Andersen; Kolding/DK
(picaandersen@yahoo.dk)

Open discussion

08:00-09:00 **Open Forum #2 (Young ECR)**

EDiR Session

EDiR
The most challenging EDiR cases and a guide to succeed

EDiR-1
Chairperson's introduction
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)

Learning Objectives:
1. To experience a real EDiR examination.
2. To present the new EDiR innovative tools to be well prepared for the exam.
3. To gain deep scientific knowledge while interacting with other residents.
4. To learn the importance of having EDiR to boost your career.

EDiR-2
EDiR innovative tools
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)
L. Beer; Vienna/AT

Learning Objectives:
1. To present the newest educational resources to prepare for the examination: EDiR simulation and webinar and EDiR educational packages.
2. To share my personal experience, to explain my learning tools and to provide advice for the exam preparation (EDiR holders).
3. To highlight the importance of EDiR and the advantages of having it (EDiR holders).

EDiR-3
EDiR teaser and discussion
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)

Learning Objectives:
1. To review some practical cases and tips and tricks: multiple response questions and short cases.
2. To understand the EDiR CORE case_ structured report of the case, differential diagnosis, reasoning of each of the possibilities as well as to consider the final diagnosis, to have a scientific discussion of the pathology and to learn some references.

Questions and answers

08:00-09:00 **Open Forum #3 (ESR)**

ESR Audit and Standards Session

ESR Audit
Clinical audit and setting standards in radiology: the European experience

ESR Audit-1
Chairperson's introduction
R. Klöckner; Mainz/DE

ESR Audit-2
Uptake of EU-BSS (2013/59 Euratom) requirements in European radiology departments: results of a repeat ESR survey
N. Bargalló; Barcelona/ES
(BARGALLO@clinic.cat)

Learning Objectives:
1. To review the findings of the original EU-BSS uptake survey from 2019.
2. To present the results of the repeat EU-BSS uptake survey undertaken in 2021.
3. To consider the current survey implications and any actions required.

ESR Audit-3
The use of checklists and coagulation monitoring in interventional radiology: developing best practice guidance
R. Klöckner; Mainz/DE
(roman.kloeckner@unimedizin-mainz.de)

Learning Objectives:
1. To appreciate the importance and clinical utility of checklists and coagulation monitoring in interventional radiology.
2. To review the existing guidelines and practices and to identify areas for improvement.
3. To consider the mechanisms to enhance existing practice in these areas.

ESR Audit-4
Teleradiology and home working: minimal standards and best practice
M. N. Özmen; Ankara/TR
(mozmen@hacettepe.edu.tr)

Learning Objectives:
1. To review the changes in radiology working and reporting practices.
2. To consider the existing guidelines and publications on teleradiology and home working.
3. To discuss the development of European minimum standards in this area.
Author Disclosures:
Mustafa N. Özmen: Share Holder: Helcon AS

ESR Audit-5
Radiology reporting of osteoporotic vertebral fragility fractures (VFFs): results of a UK audit and re-audit
A. Marzoug; Dundee/UK

Learning Objectives:
1. To review the national radiology clinical audit infrastructure in the UK.
2. To present the findings of the VFF reporting initial audit and re-audit, with an emphasis on interventions to improve compliance.
3. To further discuss the development of national clinical audit infrastructure at a European level.

Panel discussion: European clinical audit and standards development: how are we doing and where can we improve?

08:00-09:00 **Room A**

Round Table Session

RT 7
Building bridges: how to build evidence in interventional oncology

RT 7-1
Chairpersons' introduction
T. K. Helmberger; Munich/DE
V. Vilgrain; Clichy/FR

Learning Objectives:
1. To understand the importance of building high-quality evidence in interventional oncology.
2. To describe the challenges that interventional oncology needs to overcome to produce high-quality evidence.
3. To discuss artificial intelligence's potential role in generating data supporting IR research.

RT 7-2
How to build and perform research in interventional oncology
P. L. Pereira; Heilbronn/DE

RT 7-3
Panel discussion
P. Reimer; Karlsruhe/DE
P. L. Pereira; Heilbronn/DE
M. Meijerink; Amsterdam/NL
(mr.meijerink@amsterdamumc.nl)
D. Arnold; Hamburg/DE
Author Disclosures:
Martijn Meijerink: Advisory Board: Medtronic, Johnson & Johnson, Angiodynamics; CEO: Interventional Oncology Solutions; Grant recepient: Medtronic, Johnson & Johnson, Angiodynamics; Research Grant/Support: Medtronic, Johnson & Johnson, Angiodynamics; Speaker: Medtronic, Johnson & Johnson, Angiodynamics

08:00-09:00 **Room B**

Refresher Course: Chest

RC 704
Kidney, skin, gastro-intestinal tract, and the lung

RC 704-1
Chairperson's introduction
L. Ebner; Berne/CH

RC 704-2
Pulmonary-renal syndromes
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)

Learning Objectives:
1. To learn about the most recent classification and the role of imaging in the multidisciplinary diagnosis.
2. To become familiar with the CT morphology of pulmonary pathology in the various forms of pulmonary renal syndromes.
3. To learn about mimics and overlapping CT findings and how to differentiate them, taking laboratory and clinical findings into consideration.
Author Disclosures:
Mathias Prokop: Research Grant/Support: Siemens, Canon; Speaker: Siemens, Canon, Bracco

RC 704-3
Thoracic manifestations of systemic disorders affecting the skin
L. Ebner; Berne/CH

Learning Objectives:
1. To provide an overview of the most prevalent systemic disorders presenting with cutaneous and thoracic manifestations.
2. To review the most pertinent chest imaging patterns in systemic disease affecting the skin and lungs, including ancillary findings beyond the lung parenchyma.
3. To elaborate on the clinical role of imaging in the diagnosis and monitoring of disease.

RC 704-4
GI, liver, pancreas, and the lung
T. Frauenfelder; Zurich/CH

Learning Objectives:
1. To discuss lung manifestation of systemic diseases including inflammatory bowel disease, cystic fibrosis, IgG4, and chronic liver disease.
2. To describe the role of radiology, especially computed tomography, in the diagnosis and management of patients with systemic diseases.
3. To identify typical pulmonary patterns of systemic disease and their differential diagnosis.
Author Disclosures:
Thomas Frauenfelder: Advisory Board: AGFA, Boehringer Ingelheim; Owner: Nothing to disclose

Panel discussion: Pulmonary manifestations of complex systemic syndromes

08:00-09:00 **Room C**

Refresher Course: Neuro

RC 711
Common requests in neuroradiology

RC 711-1
Chairperson's introduction
J. Boban; Novi Sad/RS
(jasmina.konstantinovic@gmail.com)

RC 711-2
Imaging of headache
J. Boban; Novi Sad/RS
(jasmina.konstantinovic@gmail.com)

Learning Objectives:
1. To differentiate between main primary headache (migraine, tension-type, and cluster) and secondary headache (associated with other brain and systemic disorders) entities with common clinical presentations.
2. To describe the main imaging findings in headache using on CT, MRI, and magnetic resonance angiography.
3. To follow the diagnostic algorithm to help guide the diagnostic workup in order to identify patients that require neuroimaging and instances where it can be omitted.

RC 711-3
Imaging of visual disturbance
Z. Rumboldt; Rovinj-Rovigno/HR
(puz3@yahoo.com)

Learning Objectives:
1. To be able to follow the course of the optic nerve and visual pathway, as it extends from the globe to the visual cortex on imaging studies.
2. To describe the tailored imaging approach based on the clinical presentation of various visual field defects.
3. To recognise the characteristic location and imaging pattern of different disease processes affecting the optic nerve and visual pathway.

RC 711-4
Imaging of vertigo
B. F. Schuknecht; Zurich/CH

Learning Objectives:
1. To establish an adequate imaging protocol to cover central and peripheral causes of vertigo.
2. To learn about the most common central causes of vertigo and their anatomical and imaging substrates.
3. To learn how to recognise peripheral aetiologies of vertigo and identify "hydrops" as a separate entity in imaging assessment.

Panel discussion: When the patient's symptoms lead us in the wrong direction

08:00-09:00 **Room E2**

Refresher Course: Musculoskeletal

RC 710

Knee ligaments

RC 710-1
Chairperson's introduction
V. Vasilevska-Nikodinovska; Skopje/MK

RC 710-2
Cruciate ligament injuries and associated meniscal tears
P. Omoumi; Lausanne/CH
(patrick.omoumi@chuv.ch)

Learning Objectives:
1. To explain the mechanism of ACL and PCL tears and describe the patterns of associated meniscal injury.
2. To describe the MRI appearances of these injuries, their clinical importance, and potential pitfalls.

RC 710-3
ACL injury: associated ligament injuries
G. Thompson; Cape Town/ZA

Learning Objectives:
1. To describe the normal anatomy and MRI appearances of the medial and lateral ligament complexes.
2. To explain the imaging appearances of injuries to these structures.

RC 710-4
ACL repair: MRI of a normal graft and the complications
P. Van Dyck; Antwerp/BE
(pieter.van.dyck@uza.be)

Learning Objectives:
1. To describe the normal anatomy and MRI appearances of an ACL repair and graft reconstruction.
2. To explain the imaging appearances of normal maturation and pathological conditions involving ligament repair.
3. To list the most valuable imaging findings that correlate with clinical complications.

Panel discussion: The role of imaging in management-related decisions of ligamentous lesions of the knee joint

08:00-09:00 **Room F1**

E^3 - The Beauty of Basic Knowledge: Pancreas

E^3 25B

Pancreatic adenocarcinoma mimickers

Moderator
R. Negrelli; Verona/IT

E^3 25B-2
Autoimmune pancreatitis
R. Negrelli; Verona/IT

Learning Objectives:
1. To learn about autoimmune pancreatitis.
2. To understand imaging findings of pancreatic adenocarcinoma mimickers.
3. To appreciate the differential diagnosis criteria with pancreatic adenocarcinoma.

E^3 25B-3
Paraduodenal pancreatitis
G. Morana; Treviso/IT
(gmorana61@gmail.com)

Learning Objectives:
1. To learn about paraduodenal pancreatitis.
2. To understand imaging findings of paraduodenal pancreatitis.
3. To appreciate the differential diagnosis criteria with pancreatic adenocarcinoma.

08:00-09:00 **Room O**

Refresher Course: Abdominal Viscera

Organised by ESR Subcommittee on Ultrasound

RC 701

Non-invasive ultrasound assessment of chronic diffuse liver disease

RC 701-1
Chairpersons' introduction
V. Cantisani; Rome/IT
(vito.cantisani@uniroma1.it)
P. Ricci; Rome/IT
Author Disclosures:
Vito Cantisani: Speaker: Samsung Mindray Bracco Canon

RC 701-2
Current concept and status of elastography for liver fibrosis
M. Secil; Izmir/TR
(mustafa.secil@deu.edu.tr)

Learning Objectives:
1. To understand the different liver elastography techniques.
2. To understand the staging and management of liver fibrosis.
3. To understand the limitations of ultrasound elastography.

RC 701-3
Diffuse liver fat infiltration: measurement with ultrasound
G. Ferraioli; Pavia/IT
(giovanna.ferraioli@unipv.it)

Learning Objectives:
1. To understand the different methods of fat measurement with ultrasound.
2. To understand the limitations of each method of measurement.
3. To understand the measurement implications for the management of a fatty liver.
Author Disclosures:
Giovanna Ferraioli: Advisory Board: Philips Medical systems, Siemens Healthineers; Equipment Support Recepient: Canon Medical Systems, Esaote SpA, Fujifilm Medical systems, Mindray Medical systems, Philips Medical systems, Siemens Healthineers; Research Grant/Support: Canon Medical

Systems, Fujifilm Medical systems, Mindray Medical systems; Speaker: Canon Medical Systems, Fujifilm Medical systems, Mindray Medical systems, Philips Medical systems, Siemens Healthineers

RC 701-4
Non-invasive ultrasound assessment of portal hypertension
M. Radzina; Riga/LV

Learning Objectives:
1. To understand the haemodynamics of portal venous flow.
2. To understand the use of splenic elastography measurements.
3. To understand the new techniques using contrast-enhanced ultrasound.
Author Disclosures:
Maija Radzina: Speaker: Canon, Bayer, Medtronic

RC 701-5
The one-stop ultrasound clinic for chronic liver disease
V. Cantisani; Rome/IT
(vito.cantisani@uniroma1.it)

Learning Objectives:
1. To understand the various B-mode appearances of chronic liver disease.
2. To understand how to incorporate the newer techniques into the examination.
3. To understand how to adapt the examination to different patient groups.
Author Disclosures:
Vito Cantisani: Speaker: Samsung Mindray Bracco Canon

Panel discussion: Current evidence

08:00-09:15 **Room Z**

EuroSafe Imaging Session

Jointly organised by EuroSafe Imaging and IAEA

EU 7

Enhancing radiation protection of patients in CT practices in Africa: opportunities for synergies between Africa, the IAEA and ESR

Moderators
G. Frija; Paris/FR
I. Bentouhami; Vienna/AT

EU 7-2
Keynote address
S. Abdulrazak; Vienna/AT
(S.Abdulrazak@iaea.org)

EU 7-3
The reality on the ground: an IAEA perspective
M. Abdel Wahab; Vienna/AT

Learning Objectives:
1. To understand the availability of CT scanners in Africa.
2. To evaluate the human resources in Africa.
3. To understand the most common indications of CT in Africa based on epidemiological considerations.
4. To discuss the justification principle as an integral part of imaging exam requisitions.

EU 7-4
IAEA efforts to promote radiation protection in Africa
M. Pinak; Vienna/AT
(m.pinak@iaea.org)

Learning Objectives:
1. To learn about the IAEA activities that support Bonn Call for action.
2. To present the Basic Safety Standards as apply to clinical radiology.
3. To provide an overview of IAEA's efforts to promote radiation protection in patients in Africa.
4. To provide a roadmap for improving radiation protection of patient activities in Africa.

EU 7-5
Overview of justification in CT practice in Mauritius
A. S. Naojee; Rose Belle/MU
(anaojee@gmail.com)

Learning Objectives:
1. To recognise barriers associated with lack of justification in CT utilisation.
2. To understand how new models can promote justification in CT use in Africa.
3. To discuss the needs for improving the justification of CT examinations in Africa.

EU 7-6
Overview of justification in CT practice in Tunisia
C. Chammakhi; Tunis/TN
(chammakhichiraz@gmail.com)

Learning Objectives:
1. To recognise barriers associated with lack of justification in CT utilisation.
2. To understand how new models can promote justification in CT use in Africa.
3. To discuss the needs for improving the justification of CT examinations in Africa.

EU 7-7
Overview of justification in CT practice in Sudan
O. Ibrahim; Khartoum/SD

Learning Objectives:
1. To recognise barriers associated with lack of justification in CT utilisation.
2. To understand how new models can promote justification in CT use in Africa.
3. To discuss the needs for improving the justification of CT examinations in Africa.

EU 7-8
ESR iGuide update
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)

Learning Objectives:
1. To learn about the imaging referral guidelines.
2. To appreciate the advantages of ESR iGuide.
3. To understand how ESR iGuide might assist radiologists in Africa in choosing appropriate imaging examinations.

EU 7-9
Panel discussion: How synergies of efforts can enhance radiation protection of patients in Africa?
All speakers and:
H. Wanga; Nairobi/KE
(drhwanga@yahoo.com)
B. Mansouri; Algiers/DZ
(boudjema.mansouri@gmail.com)
D. Husseiny Salama; Cairo/EG
M. Mikhail Lette; Vienna/AT

10:30-11:30 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 8R

Top tips in oncology imaging 1: protocols for pancreas and biliary tree imaging

Moderator
F. Zarb; Msida/MT

Learning Objectives:
1. To describe top tips for scan protocols, patient preparation, and patient aftercare for oncologic imaging of the pancreas and biliary tree.
2. To discuss the key clinical findings, pathology, and common pitfalls for oncologic imaging of the pancreas and biliary tree.

OF 8R-2
CT pancreas: presentation radiographer
E. Thomas; Dublin/IE

OF 8R-3
CT pancreas: presentation radiologist
J. J. Hermans; Nijmegen/NL
(john.hermans@radboudumc.nl)
Author Disclosures:
John J. Hermans: Employee: Radboud university medical center; Grant recepient: Horizon2020, Dutch National Cancer Fund; Research Grant/Support: see grant recipient

Discussion

OF 8R-5
Magnetic resonance cholangiopancreatography (MRCP): presentation radiographer
W. Gilani; Amsterdam/NL

OF 8R-6
Magnetic resonance cholangiopancreatography (MRCP): presentation radiologist
J. J. Hermans; Nijmegen/NL
(john.hermans@radboudumc.nl)
Author Disclosures:
John J. Hermans: Employee: Radboud university medical center; Grant recepient: Horizon2020, Dutch National Cancer Fund; Research Grant/Support: see grant recipient

Discussion

10:30-11:30 **Open Forum #2 (Young ECR)**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESOR

BS 8

Radiologic anatomy: breast

Moderator
T. H. Helbich; Vienna/AT

BS 8-2
Congenital and developmental abnormalities of the breast
S. J. Vinnicombe; Gloucestershire/UK
(sarah.vinnicombe@nhs.net)

Learning Objectives:
1. To appreciate the normal pattern of breast development.
2. To learn about congenital and developmental abnormalities.
3. To appreciate the importance of the nipple-areola complex and ist influence on imaging.

Discussion

BS 8-4
About ducts and lobules and how they influence breast imaging
S. J. Vinnicombe; Gloucestershire/UK
(sarah.vinnicombe@nhs.net)

Learning Objectives:
1. To learn about normal ductal and lobar anatomy of breast tissue.
2. To appreciate how the individual ductal-lobar distribution may influence breast density and imaging.
3. To understand the ductal-lobular relevance in benign and malignant breast disease.

Discussion

BS 8-6
What radiologists have to teach breast surgeons about breast anatomy
I. Thomassin-Naggara; Paris/FR
(isabelle.thomassin@tnn.aphp.fr)

Learning Objectives:
1. To learn how breast anatomy and its variants influence surgical management.
2. To acknowledge lymph node anatomy and how its variants influence surgical management.
3. To describe the imaging appearance of breast and lymph node anatomy and their variants.
Author Disclosures:
Isabelle Thomassin-Naggara: Advisory Board: Bayer, Bracco, Guerbet, Bard; Speaker: GE, Siemens, Hologic, Canon, Guerbet, Fujifilm, ICAD? incepto, GSK

Discussion

BS 8-8
Functional and metabolic breast anatomy by MRI and PET
K. Pinker-Domenig; New York, NY/US
(pinkerdk@mskcc.org)

Learning Objectives:
1. To understand functional and metabolic imaging information derived from PET or MRI.
2. To learn about background parenchymal enhancement/uptake and DWI or MRS metrics.
3. To acknowledge how metabolic and functional imaging information can influence a diagnosis.

Discussion

10:30-11:30 **Open Forum #3 (ESR)**

Open Forum Session

Organised by EuroSafe Imaging

OF 8a

Artificial intelligence (AI) for image quality assessment from a clinical perspective

OF 8a-1
Chairpersons' introduction
C. Hoeschen; Magdeburg/DE
(christoph.hoeschen@ovgu.de)
G. Frija; Paris/FR
(guyfrija@gmail.com)

OF 8a-2
AI-based MRI image quality assessment
C. Hoeschen; Magdeburg/DE
(christoph.hoeschen@ovgu.de)

Learning Objectives:
1. To understand image quality characteristics of MR imaging.
2. To learn about how AI methods can be used to help to assess image quality in MR images.
3. To understand the limitations of AI-based image quality assessment in MRI.

OF 8a-3
Application of machine learning techniques for image quality assessment in chest CT
Z. Passand; Magdeburg/DE
(zahra.passand@ovgu.de)

Learning Objectives:
1. To understand the needs and challenges for an automated quality assessment of clinical CT images.
2. To apply machine learning techniques for the purpose of CT image quality analysis.
3. To compare and evaluate different machine learning techniques for a certain application.

OF 8a-4
Clinical experience of AI-based quality assessment
E. L. Siegel; Baltimore, MD/US
(esiegel@umaryland.edu)

Learning Objectives:
1. To define the concept of image quality in diagnostic imaging.
2. To list examples of current commercial software for image quality assessment.
3. To describe future potential applications of quality assessment AI tools for diagnostic imaging.

Open forum discussion

10:30-11:30 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the ESR National Societies Committee

OF 8b

Harnessing the strengths of our National Societies

Moderator
A. G. Rockall; London/UK

Learning Objectives:
In this session we will present three topics that are currently a focus of activity for the National Societies Committee. Short lectures will be given on the topics of developing an audit network through the National Societies, engagement with the National Societies to develop information resources for patients in their own language, and an initiative for providing support to members who are working on procedure code harmonisation. The floor will then be open for questions and discussion.

OF 8b-2
National Societies Audit on safety checklist
A. G. Rockall; London/UK

OF 8b-3
Safe haven for patient information
E. Steinthaler; Vienna/AT
(post@evelynsteinthaler.com)

OF 8b-4
How can we harness the power of coding?
M. Kämmerer; Bochum/DE
(kaemmerer@visus.com)
Author Disclosures:
Marc Kämmerer: Employee: Head of Innovation Management at VISUS Health IT GmbH, Germany

Discussion

10:30-11:30 **Tech Gate Auditorium**

Patients in Focus

IF 8

Listen to your patients: listening to the patient to improve the quality of service to your patients

Moderators
L. E. Derchi; Genoa/IT
J. McNulty; Dublin/IE

IF 8-2
Introduction
L. E. Derchi; Genoa/IT

Learning Objectives:
1. To learn from examples how a survey in the department can be constructed and the main obstacles.
2. To understand that patients have a personal, individual view on the quality of the provided service in the department.
3. To appreciate that this exercise needs to be repeated to go into a path of continuous quality improvement that should run in line with other quality objectives of the department.

IF 8-3
A case study in Mercy University Hospital, Cork, Ireland
A. Brady; Cork/IE
(adrianbrady@me.com)

Learning Objectives:
1. To learn about the importance of patient input in guiding their radiological investigation and interpretation.

IF 8-4
The case ZOL, Genk Belgium and the patient's view on patient satisfaction
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To learn about the use of surveys, using the case study of Ziekenhuis Oost Limburg, Genk, Belgium.
2. To learn that a survey is capable of capturing the wishes of patients and their satisfaction with actual processes.
3. To understand that a survey needs to be well prepared to find the answers to the questions that matter.
4. To appreciate that a survey has no value if the lessons don't lead to changes in practice and that surveys become part of continuous improvement of service quality, disclosing training needs for the staff and issues with communication.

IF 8-5
A radiographers view on "listening to patients" to improve the "service" to patients
E. Hyde; Derby/UK
(E.Hyde@derby.ac.uk)

Learning Objectives:
1. To appreciate the important role radiographers have in improving patient care.
2. To learn how this role differs from radiologists and how these two professions can work together for the good of the patient.
3. To discuss how the process of listening to your patient can be improved.
Author Disclosures:
Emma Hyde: Advisory Board: University of Derby

IF 8-6
Panel discussion: How can we organise a patient satisfaction survey in a radiology department?
D.-G. Carrié; Toulouse/FR
(dominiquecarrie@wanadoo.fr)

10:30-12:00 **Room C**

E³ - Advanced Courses: Cancer Imaging

E³ 818

New treatment strategies in renal cell carcinoma: a multidisciplinary approach

E³ 818-1
Chairperson's introduction
L. S. Fournier; Paris/FR

Learning Objectives:
1. To present new treatment concepts in metastatic renal cell carcinoma.
2. To explore the need for nephrectomy in the context of these new treatment concepts.
3. To discuss the aspects related to treatment response with presented new treatment paradigms.
Author Disclosures:
Laure S. Fournier: Grant recepient: Bristol Myers Squibb; Research Grant/Support: Philips, Evolucare, Ariana Pharma; Speaker: Bayer, Novartis, Janssen, Sanofi, GE Healthcare; Other: Traveling support: Guerbet

E³ 818-2
New paradigms of treatment for the curable cancer: the surgeon's view
M. Cumberbatch; Sheffield/UK
(m.g.cumberbatch@sheffield.ac.uk)

E³ 818-3
New paradigms for the treatment for metastasised renal cancer: the oncologist's view
M. Schmidinger; Vienna/AT

Author Disclosures:
Manuela Schmidinger: Advisory Board: BMS, Merck, MSD, Ipsen, Exelixis, Pfizer, EUSA, EISAI; Speaker: BMS, Merck, MSD, Ipsen, Exelixis, Pfizer, EUSA, EISAI

E³ 818-4
Radiologist: new response profiles with new treatment paradigms
L. S. Fournier; Paris/FR
(laure.fournier@aphp.fr)
Author Disclosures:
Laure S. Fournier: Grant recepient: Bristol-Myers-Squibb; Research Grant/Support: Philips, Evolucare, ArianaPharma; Speaker: Bayer, Novartis, Janssen, Sanofi, GE Healthcare

E³ 818-5
Multidisciplinary tumour board: case-based panel discussion
L. S. Fournier; Paris/FR
(laure.fournier@aphp.fr)
Author Disclosures:
Laure S. Fournier: Grant recepient: Bristol Myers Squibb; Research Grant/Support: Philips, Evolucare, ArianaPharma; Speaker: Bayer, Novartis, Janssen, Sanofi, GE Healthcare

10:30-12:00 **Room E2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 821b

Focal testicular lesions: challenging conditions

E³ 821b-1
Acutely painful lesions
V. S. Dogra; Rochester, NY/US
(Vikram_Dogra@URMC.Rochester.Edu)

Learning Objectives:
1. To describe the imaging findings of tumours and tumour-like testicular lesions presenting clinically with acute scrotal pain.
2. To learn how to integrate clinical and imaging findings for the differential diagnosis between benign and malignant lesions.

E³ 821b-2
The small, incidentally-detected lesion
D. Y. Huang; London/UK
(dean.huang@nhs.net)

Learning Objectives:
1. To learn about the prevalence of small testicular lesions incidentally detected at US.
2. To learn how to improve the characterisation of small incidentally-detected testicular lesions.
3. To discuss how to manage the patient with small incidentally-detected testicular lesions.

10:30-12:00 **Room G**

E³ - Advanced Courses: Lung, Mediastinum and Pleural Imaging

E³ 831

Mediastinal tumours: abstention, medical, or surgical treatment?

E³ 831-1
Chairperson's introduction
T. Frauenfelder; Zurich/CH

Learning Objectives:
1. To recognise which mediastinal masses require diagnostic work-up.
2. To decide when and how to perform a percutaneous biopsy.
3. To understand the game-changer role of Car-T cell therapy.
Author Disclosures:
Thomas Frauenfelder: Advisory Board: AGFA, Boehringer Ingelheim

E³ 831-2
Car-T cell therapy for the treatment of refractory B cell lymphoma: a revolution? The haematologist's view
S. Anguille; Edegem/BE
(Sebastien.Anguille@uza.be)

Learning Objectives:
1. To understand the basics of Car-T cell therapy.
2. To learn about the specific side-effects of Car-T cell therapy.
3. To gain an understanding of the future evolution in the field.

E³ 831-3
Diagnostic approach using CT and MRI
T. Frauenfelder; Zurich/CH

Learning Objectives:
1. To compare the imaging features of benign and malignant lesions.
2. To formulate the correct staging of malignant tumours.
3. To select the most appropriate imaging modality according to the clinical question and circumstances.
Author Disclosures:
Thomas Frauenfelder: Advisory Board: AGFA, Boehringer Ingelheim

E³ 831-4
When and how to perform percutaneous biopsy: interventional oncology
E. de Kerviler; Paris/FR
(eric.de-kerviler@sls.aphp.fr)

Learning Objectives:
1. To review the classical percutaneous approaches for mediastinal lesions.
2. To learn the tips and tricks to increase the diagnostic yield of percutaneous biopsies.
3. To learn when to biopsy a mediastinal mass and when not to.

E³ 831-5
Multidisciplinary tumour board: case-based panel discussion
T. Frauenfelder; Zurich/CH
Author Disclosures:
Thomas Frauenfelder: Advisory Board: AGFA, Boehringer Ingelheim

10:30-12:00 **Room K**

E³ - Advanced Courses: Gynaecology/Genitourinary Imaging

E³ 832
Endometriosis: a multidisciplinary approach

E³ 832-1
Chairperson's introduction
R. Forstner; Salzburg/AT

Learning Objectives:
1. To learn about the spectrum of imaging findings in endometriosis.
2. To correlate the clinical symptoms with imaging findings.
3. To recognise endometriosis-associated malignancies.
4. To understand the role of imaging in treatment planning in endometriosis.

E³ 832-2
Clinical background and management of endometriosis: the surgeon
M. Mabrouk; Cambridge/UK

Learning Objectives:
1. To identify the most critical locations for deep infiltrating endometriosis.
2. To discuss the essential characteristics of the affected anatomical structures that influence the surgical strategy.
3. To describe the severity of the disease in a structured and reproducible scoring system.

E³ 832-3
Endometriosis: typical and atypical imaging findings
N. Bharwani; London/UK

Learning Objectives:
1. To discuss the three main types of endometriosis, the different anatomical sites of deep-pelvic endometriosis involvement, and to correlate these to the patient's clinical manifestations.
2. To describe the typical ultrasound and MR imaging findings of deep-pelvic endometriosis.
3. To identify imaging findings of atypical endometriosis, such as in the abdominal wall, groin, and pelvic nerves.

E³ 832-4
Imaging of deep endometriosis: providing a GPS to surgery
L. Manganaro; Rome/IT
(lucia.manganaro@uniroma1.it)

Learning Objectives:
1. To identify and describe all potential sites of deep endometriosis and degree of infiltration.
2. To predict endometriotic pelvic nerve involvement to address nerve-sparing surgery.
3. To write a structured report to improve interdisciplinary communication and facilitate surgical planning.

E³ 832-5
Multidisciplinary tumour board: case-based panel discussion
R. Forstner; Salzburg/AT
(r.forstner@salk.at)

10:30-12:00 **Room M 4**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 821c
New directions in cardiac imaging

E³ 821c-1
Mapping techniques for advanced tissue characterisation
A. Rossi; Zurich/CH

Learning Objectives:
1. To become familiar with the MRI physical principles and imaging protocols of parametric mapping.
2. To learn about the potential of multiparametric MRI in heart tissue characterisation.
2. To discuss the current challenges and future directions for heart tissue characterisation.

E³ 821c-2
Cardiac arrythmia and fusion imaging
M. Muça; Fürth/DE

Learning Objectives:
1. To learn about the prognostic impact of preoperative assessment of cardiac electromechanical dyssynchrony in patients scheduled for CRT-implantation.
2. To learn about the role of fusion on CT/MRI images and electrocardiographic data for atrial and ventricular scar identification as the source of arrhythmia.
3. To understand how cardiac fusion imaging and heart 3D representation may aid electrophysiological invasive treatment in patients with arrythmogenic scars.

10:30-12:00 **Room M 5**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 819

The traumatic knee: a multidisciplinary approach

E³ 819-1
Chairperson's introduction
J. J. Visser; Rotterdam/NL
(j.j.visser@erasmusmc.nl)

Learning Objectives:
1. To understand the orthopedic's radiological information needs in patients with traumatic knee injury.
2. To know what information the radiologist can provide in patients with traumatic knee injury.
Author Disclosures:
Jacob J. Visser: Advisory Board: Contextflow, Quibim

E³ 819-2
The knee: the orthopaedic's perspective
T. Piscaer; Rotterdam/NL

E³ 819-3
The knee: the radiologist's perspective
D. Hanff; Rotterdam/NL
(d.hanff@erasmusmc.nl)

E³ 819-4
Case-based discussions
J. J. Visser; Rotterdam/NL
(j.j.visser@erasmusmc.nl)
D. Hanff; Rotterdam/NL
(d.hanff@erasmusmc.nl)
T. Piscaer; Rotterdam/NL
Author Disclosures:
Jacob J. Visser: Advisory Board: Contextflow, Quibim

10:30-12:00 **Room N**

State of the Art Symposium

SA 8

Controversies and pitfalls in imaging of the head and neck

SA 8-1
Chairperson's introduction
E. Loney; Halifax/UK

SA 8-2
Controversies in oncological head and neck imaging
M. Becker; Geneva/CH
(minerva.becker@hcuge.ch)

Learning Objectives:
1. To become familiar with selected controversial topics in oncologic head and neck imaging, such as which imaging technique to use for the initial staging of head and neck cancer, and whether imaging biomarkers really have a clinical impact or is there a role for systematic cross-sectional imaging in the follow-up of treated head and neck cancer.
2. To understand the background of these controversies, the "pro" and "contra" perspectives of the respective topics, and well-reasoned opinions supporting the different sides.
3. To become aware of the limitations and challenges of publication bias, as well as their effect on ongoing controversies.

SA 8-3
Controversies in non-oncological head and neck imaging
S. Connor; London/UK
(sejconnor@gmail.com)

Learning Objectives:
1. To highlight where "controversies" exist in imaging of the skull base, temporal bone, paranasal sinuses, and neck soft tissue.
2. To present a series of non-oncological examples where there are variable methods to imaging and interpretation in the head and neck.
3. To outline the current evidence (where present) and arguments for and against the different approaches.

SA 8-4
Pitfalls in head and neck imaging
D. Farina; Brescia/IT
(davide.farina@unibs.it)

Learning Objectives:
1. To learn about anatomical variants in the head and neck that may be misinterpreted as pathology.
2. To discuss the most common technical errors in CT or MRI scans.
3. To understand how the interpretation of images may be misled by the wrong technique or acquisition.

SA 8-5
Incidental findings in head and neck imaging
A. Borges; Lisbon/PT
(borgalexandra@gmail.com)

Learning Objectives:
1. To become familiar with the most prevalent incidentalomas in head and neck imaging studies.
2. To understand their relevance.
3. To learn about how they should be managed.

Panel discussion: Mistakes I've made and what I learnt from them

10:30-12:00 **Room O**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 821a

Safety of radiologic contrast media: an update

E³ 821a-1
Acute non-renal adverse reactions
L. Romanini; Brescia/IT

Learning Objectives:
1. To illustrate the spectrum of acute non-renal adverse reactions after radiologic contrast media injection.
2. To become familiar with the treatment of acute non-renal adverse reactions.

E³ 821a-2
Contrast media extravasation
G. Roditi; Glasgow/UK
(Giles.Roditi@glasgow.ac.uk)

Learning Objectives:
1. To understand the pathophysiology, diagnosis, and risk factors of contrast media extravasation.
2. To illustrate how to prevent, reduce the severity, and manage contrast media extravasation.

10:30-12:00 **Room X**

Special Focus Session

SF 8

Thoracic imaging: more than just the lungs

SF 8-1
Chairperson's introduction
C. W. A. Pfirrmann; Zurich/CH

SF 8-2
Airways: dynamic and functional imaging
G. Milanese; Parma/IT

Learning Objectives:
1. To describe the anatomy of the airways, from the trachea to the respiratory bronchiole.
2. To list the differential diagnoses of the main pathologies affecting both proximal and distal airways.
3. To appreciate how different imaging protocols, including dynamic protocols, can be used to assess airway disease.

SF 8-3
Vessels: acute and chronic pulmonary vascular disease
J. D. Dodd; Dublin/IE

Learning Objectives:
1. To describe a systematic assessment of the vessels and parenchyma for pulmonary vascular disease, including pulmonary hypertension.
2. To list the benefits and limitations of different imaging modalities in assessing pulmonary vascular disease.
3. To appreciate how imaging contributes to risk stratification and the management of acute pulmonary embolism.

SF 8-4
Mediastinum: anatomy and pathology
G. Milanese; Parma/IT

Learning Objectives:
1. To describe the borders of contemporary mediastinal compartments in 2D and 3D imaging.
2. To list the differential diagnoses of the main mediastinal diseases in each mediastinal compartment.
3. To reflect on the various patterns of tumour dissemination and how they relate to thoracic lymphatic drainage.

SF 8-5
Bones and the chest wall
C. W. A. Pfirrmann; Zurich/CH

Learning Objectives:
1. To identify the main muscles and skeletal structures of the chest wall.
2. To list the common incidental musculoskeletal pathologies that may be encountered when imaging the chest.
3. To understand the indications for dedicated imaging of the chest wall, including MRI, radionuclide bone imaging, and ultrasound.

Panel discussion: Is there a "one-stop-shop" method for imaging the chest?

11:00-12:00 **Room A**

Round Table Session

Jointly organised by the ESR and ECO (European Cancer Organisation)

RT 8

Building bridges: digital transformation of (cancer) healthcare

RT 8-1
Chairpersons' introduction
R. G. H. Beets-Tan; Amsterdam/NL
M. Aapro; Genolier/CH

RT 8-3
The EU perspective
S. Rinne; Luxembourg/LU

Learning Objectives:
1. To learn about the initiatives in digital health at the EU level.
2. To understand how the digitalisation of health sectors can improve health care systems

RT 8-4
The imaging perspective
E. Kotter; Freiburg/DE

Learning Objectives:
1. To understand whether artificial intelligence re-imagines diagnostic radiology.
2. To understand the role of the radiologist in the era of artificial intelligence.
3. To learn about the regulatory requirements for artificial intelligence-assisted diagnosis to ensure safety for the patients.
Author Disclosures:
Elmar Kotter: Advisory Board: Contextflow; Share Holder: Contextflow; Speaker: SIemens Healthineers, AbbVie

RT 8-5
The patient's perspective
G. Spurrier-Bernard; Auvergne/FR

Learning Objectives:
1. To hear about the patient's perspective on the European Cancer Patient Digital Center.
2. To understand what needs to be done to ensure patients' safety when sharing their data.
3. To learn which issues may arise regarding health and digital literacy and how to solve these.
Author Disclosures:
Gilliosa Spurrier-Bernard: Advisory Board: Participated in Advisory Boards and received Honoraria from Novartis, MSD, BMS, Amgen

RT 8-6
The industry's perspective
B. Vannieuwenhuyse; Beerse/BE
(BVANNIEU@its.jnj.com)

Learning Objectives:
1. To learn about the industry's perspective of digital transformation of (cancer) health care.
2. To understand whether digitalisation might impact the design and execution of clinical trials.
3. To understand whether the availability of new biomarkers from imaging, tissue, genetics, and blood could potentially impact drug discovery research.

Panel discussion: How can digital transformation of health care systems improve health care sectors and what are the obstacles that may hamper or slow down the process?

12:30-13:30 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 9R

Top tips in oncology imaging 2: protocols for gastrointestinal imaging

Moderator
F. Zarb; Msida/MT

Learning Objectives:
1. To describe top tips for scan protocols, patient preparation, and patient aftercare for oncologic imaging of the gastrointestinal system.
2. To discuss the key clinical findings, pathology, and common pitfalls for oncologic imaging of the gastrointestinal system.

OF 9R-2
CT gastro-intestinal: presentation radiographer
D. Kearney; Dublin/IE

OF 9R-3
CT gastro-intestinal: presentation radiologist
K. Cronin; Dublin/IE

Discussion

OF 9R-5
MR rectum: presentation radiographer
M. van der Lubbe; Amsterdam/NL

OF 9R-6
MR rectum: presentation radiologist
M. J. Lahaye; Amsterdam/NL
(MJ.Lahaye@gmail.com)

Discussion

12:30-13:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 9Y

Meet the professors: part 2

OF 9Y-1
Chairperson's introduction
L. Segger; Berlin/DE

Learning Objectives:
Distinguished professors of radiology are invited, together with their younger colleagues, to share their experience, their vision, and give advice and guidance to the younger generation of radiologists.

OF 9Y-2
How to choose and pursue your way in clinical and/or academic radiology?
B. Hamm; Berlin/DE
L. J. Savic; Berlin/DE
A. Frisch; Berlin/DE
(anne.frisch@charite.de)
Author Disclosures:
Anne Frisch: Other: Involvement in the development of Raducation as member of the Young Radiology Forum (Forum Junge Radiologie)

OF 9Y-3
Leadership and mentorship
M. I. Argyropoulou; Ioannina/GR
(margyrop@uoi.gr)

Discussion

12:30-13:30 **Open Forum #3 (ESR)**

Open Forum Session

Organised by the ESOR

OF 9a

Connecting with research in the human connectome: tips and tricks to demystify the study tools

OF 9a-1
Chairperson's introduction
R. Viard; Lille/FR

OF 9a-2
Connecting with research in the human connectome
R. Viard; Lille/FR

Learning Objectives:
1. To enhance the understanding of the concept of connectome and connectomics.
2. To improve the understanding of network neuroscience tools and how they can be applied to understand healthy brain organisation and to study brain disorders (psychiatric and neurological).
3. To show how we can use connectomics to study transdiagnostic effects across disorders.

OF 9a-3
Tips and tricks to demystify the study tools
L. G. Astrakas; Ioannina/GR
(astrakas@uoi.gr)

Learning Objectives:
1. To distinguish the different types of brain connectivity (structural, functional, and effective).
2. To identify and comprehend the different types of connectome maps.
3. To describe how brain disorders alter and reorganise the brain connectome.

Open forum discussion

12:30-13:30 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the ESR Education Committee

OF 9b

ESR Education Committee: activities and projects

Moderator
M. Becker; Geneva/CH

Learning Objectives:
This session will present the structure, goals and activities of the ESR Education Committee and its subcommittees, the Radiology Trainees Forum, the Undergraduate Education Subcommittee and the eLearning Subcommittee, and their impact on the education of current and future radiologists.

OF 9b-2
Introduction
M. Becker; Geneva/CH

OF 9b-3
ESR Radiology Trainees Forum
M. Reim; Tartu/EE
Author Disclosures:
Martin Reim: Board Member: Estonian Society of Radiology; Employee: Tartu University Hospital; Founder: Better Medicine OÜ; Share Holder: Better Medicine OU, Pfizer Corporation

OF 9b-4
ESR Undergraduate Education Subcommittee
V. J. Goh; London/UK
(vicky.goh@kcl.ac.uk)

OF 9b-5
ESR eLearning Subcommittee
S. Barter; Bedford/UK

Discussion

12:30-13:30 **Room A**

Round Table Session

RT 9
Building bridges: the green radiology department

RT 9-1
Chairperson's introduction
A. Brady; Cork/IE

Learning Objectives:
1. To learn ways to achieve a sustainable and long-term energy saving radiology department.
2. To understand how minor changes to the settings of the reporting stations in a radiology department can result in significant energy savings and promote energy-wise habits.

RT 9-2
Shaping the radiology department of the future: environmental sustainability
A. G. Rockall; London/UK

RT 9-3
Teaming up to define metrics and methodologies to decarbonise imaging
O. Struk; Amsterdam/NL
(Olesya.Struk@philips.com)
Author Disclosures:
Olesya Struk: Employee: Royal Philips; Share Holder: Royal Philips

RT 9-4
Discussion
A. G. Rockall; London/UK
L. E. Derchi; Genoa/IT
D. Pinto dos Santos; Cologne/DE
(daniel.pinto-dos-santos@uk-koeln.de)
F. Sardanelli; San Donato Milanese/IT
(francesco.sardanelli@unimi.it)
O. Struk; Amsterdam/NL
Author Disclosures:
Daniel Pinto dos Santos: Advisory Board: cook medical; Speaker: Bayer
Francesco Sardanelli: Advisory Board: Bayer, Bracco, DeepTrace Technologies, General Electric; Equipment Support Recepient: General Electric; Research Grant/Support: Bayer, Bracco, General Electric

12:30-13:30 **Room B**

E³ - The Beauty of Basic Knowledge: Pancreas

E³ 25C
Solid pancreatic neoplasms

Moderator
M. D'Onofrio; Verona/IT

E³ 25C-2
Diagnosis
M. Zins; Paris/FR
(mzins@hpsj.fr)

Learning Objectives:
1. To learn about the diagnostic imaging findings of solid pancreatic neoplasms.
2. To understand treatment planning.
3. To appreciate the differential diagnosis of solid pancreatic neoplasms.

E³ 25C-3
Staging
N. Kartalis; Stockholm/SE
(nikolaos.kartalis@ki.se)

Learning Objectives:
1. To learn how to stage pancreatic adenocarcinoma.
2. To understand the resectability criteria.
3. To appreciate the role of imaging in treatment planning.

12:30-13:30 **Room G**

ESR meets the Netherlands

Meets 9
Radiological projects of the Netherlands

Presiding
R. G. H. Beets-Tan; Amsterdam/NL
M. Prokop; Nijmegen/NL

Meets 9-1
Welcome and introduction
R. G. H. Beets-Tan; Amsterdam/NL
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)
Author Disclosures:
Mathias Prokop: Speaker: Siemens, Canon, Bracco

Meets 9-2
Liver-heart
H. J. Lamb; Leiden/NL
(h.j.lamb@lumc.nl)

Learning Objectives:
1. To understand the basic and clinical concepts of the relationship between non-alcoholic fatty liver disease (NAFLD) and cardiovascular function and metabolism.
Author Disclosures:
Hildo J. Lamb: Investigator: Scientific collaboration with Perspectum, UK; Research Grant/Support: Clinical trials sponsored by Lilly & Novo Nordisk

Meets 9-3
Heart-brain
B. K. Velthuis; Utrecht/NL
(b.k.velthuis@umcutrecht.nl)

Learning Objectives:
1. To understand the importance of a multidisciplinary approach to the heart-brain axis.
2. To regard atherosclerosis as a systemic disease affecting multiple organs.
3. To appreciate the impact of cardioembolic causes of ischaemic stroke.
4. To learn that the cardiovascular status can affect patients with cognitive impairment.
5. To recognise that stress can be a cause of cardiac dysfunction.

Meets 9-4
Radiology and nuclear medicine residency education (Corona)
R. Bennink; Amsterdam/NL
L. Peters-Bax; Nijmegen/NL

Learning Objectives:
1. To gain insight in the rationale for integrating radiology and nuclear medicine training programs in the Netherlands.
2. To learn about the process of making and improving an integrated residency program.
3. To gain insight in quality monitoring of Dutch residency programs.

Relaxing short video

12:30-13:30 **Room M 3**

Refresher Course: Vascular

RC 915
Vasculitis revisited

RC 915-1
Chairperson's introduction
V. Bérczi; Budapest/HU

RC 915-3
Brain
L. van den Hauwe; Antwerp/BE
(lucvdhauwe@mac.com)

Learning Objectives:
1. To understand the value of proper clinical information to suggest vasculitis.
2. To learn about the imaging methods available for imaging patients with suspected vasculitis.
3. To understand the difficulties in diagnosing vasculitis.

RC 915-4
Body manifestations of large vessel vasculitis
T. Bley; Würzburg/DE
(bley_t@ukw.de)

Learning Objectives:
1. To understand the pathophysiology of large vessel vasculitis.
2. To learn about colour-coded duplex sonography, MRI, and PET CT available for imaging large vessel vasculitis.
3. To understand the pitfalls in the various imaging modalities in diagnosing vasculitis.
Author Disclosures:
Thorsten Bley: Employee: Julius-Maximilians-Universität Wuerzburg, Germany; Grant recepient: Deutsche Forschungsgemeinschaft (DFG); Research Grant/Support: Siemens Healthineers; Speaker: Novartis, Roche/Chugai, Sanofi, Siemens

RC 915-5
Interventional radiology implications of vasculitis
F. Fanelli; Florence/IT

Learning Objectives:
1. To define the role of endovascular therapy in vasculitis.
2. To learn the endovascular techniques used in the treatment of vasculitis.
3. To discuss the different embolic agents available.
Author Disclosures:
Fabrizio Fanelli: Advisory Board: MEDTRONIC, PHILIPS; Speaker: Ivascular, Cook, WL Gore & Associates, Medtronic, BD, Volcano

Panel discussion: The need for multidisciplinary in diagnosis and treatment

12:30-13:30 **Room M 4**

E³ - The Beauty of Basic Knowledge: A Survival Guide to Musculoskeletal Imaging

E³ 24B
Critical appraisal of MSK terminology

Moderator
G. Guglielmi; Foggia/IT

Learning Objectives:
The available imaging lexicon that can be used to describe radiological abnormalities is wide ranging. When a bony abnormality is detected, it is critical that appropriate care is taken in the choice of word used to describe it. A proper understanding of the spectrum of conditions that can create the pathological processes that result in the imaging manifestation is essential. This needs to be understood by both the reporter and the reader of the report. For example, reduced bone density can be described in many ways – osteopenia, osteoporosis, undermineralisation, demineralisation – but they are not the same.

E³ 24B-2
Osteopenia
K. Verstraete; Ghent/BE

Learning Objectives:
1. To name and identify the metabolic and endocrine disorders that cause osteopenia.
2. To list the radiologic imaging modalities and imaging techniques for evaluating bone mineral density.
3. To interpret and describe the imaging findings in patients with osteoporosis, rickets, osteomalacia, and miscellaneous metabolic and endocrine disorders that cause osteopenia.

E³ 24B-3
Periosteal reaction
G. K. O. Aström; Uppsala/SE
(Gunnar.Astrom@radiol.uu.se)

Learning Objectives:
1. To describe the anatomy, histology, and physiology of the periosteum.
2. To understand the background and signs of different periosteal reactions.
3. To reflect how knowledge of periosteal reaction patterns is helpful for patient care and the differential diagnosis.

E³ 24B-4
Bone marrow oedema
K. Wörtler; Munich/DE

Learning Objectives:
1. To learn when to use the term "bone marrow oedema".
2. To differentiate bone marrow oedema from bone marrow replacement on MR images.
3. To become familiar with the underlying causes of bone marrow oedema.

Panel discussion

12:30-13:30 **Room M 5**

E³ - The Beauty of Basic Knowledge: Problem Solving Tips and Tricks for Brain Imaging

E³ 30B
Ventricles, volumes, and pressures

Moderator
M. Sasiadek; Wroclaw/PL

E³ 30B-2
Hydrocephalus, atrophy, or both (assessing the ventricular system, basal cisterns, and extracerebral CSF spaces)
M. Palm; Maastricht/NL
(miguel.palm@mumc.nl)

Learning Objectives:
1. To learn how to measure the ventricular system and how to define hydrocephalus and atrophy.
2. To become familiar with differentiating between communicating and non-communicating hydrocephalus.
3. To learn how to apply quantitative imaging metrics in diagnosis and follow-up of these conditions.

E³ 30B-3
Intracranial hypotension
J. Bladowska; Wroclaw/PL
(joanna.bladowska@umw.edu.pl)

Learning Objectives:
1. To review the causes of intracranial hypotension.
2. To discuss the imaging hallmarks.
3. To become familiar with what radiologists do to treat these conditions.

E³ 30B-4
Idiopathic intracranial hypertension
R. M. Kwee; Sittard-Geleen/NL
(rmkwee@gmail.com)

Learning Objectives:
1. To define intracranial hypertension and the causes.
2. To review the imaging characteristics.
3. To discuss the role of the dural venous sinuses in this condition.

12:30-13:30 **Room O**

Patients in Focus

IF 9a

The power of exchange: a success story, track record, and its achievement!

Moderators
M. H. Fuchsjäger; Graz/AT
C. Justich; Vienna/AT

IF 9a-2
Introduction
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)

Learning Objectives:
1. To learn about the changing role of the radiologist, closer to the clinicians and patients.
2. To appreciate the new positioning of the radiologist in the medical world.

IF 9a-3
Industry view: improving patients' empowerment
R. Walton; Bucks/UK

Learning Objectives:
1. To learn how technology, digital and artificial intelligence, are going to elevate the patient's journey.
2. To appreciate how industry can support inpatient and outpatient care.
3. To understand that healthcare professionals, industry, and patients will work together to re-imagine what is possible.

IF 9a-4
The radiologist as a virtual surgeon
A. Stenzl; Tübingen/DE
(arnulf.stenzl@med.uni-tuebingen.de)

Learning Objectives:
1. To learn what clinicians need and expect from radiologists.
2. To appreciate the role of every member of the medical team and to underline the power of this exchange and interaction, and to demonstrate building bridges at the University Clinic Eberhard Karls Tübingen by implementing a complementary health department at the clinic campus.
3. To understand what the future of medicine and this mutual work might look like and to focus on the benefits and improvements this will bring among all stakeholders.

IF 9a-5
A true story of success: the radiologist as a game changer
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
C. Justich; Vienna/AT
(cjustich@me.com)

Learning Objectives:
1. To learn about the important role of the radiologist for the patient and to demonstrate how a new positioning of the radiologist in the medical world is possible in practice.
2. To appreciate the changes in clinical practice underlining the importance of the radiologist as a gatekeeper and their work on a multidisciplinary level, and the potential for a successful radiologist-patient relationship.
3. To understand how interaction, exchange, giving hope, building bridges, and working as a team can lead to a success story.
4. To learn how it worked out in real life and to present the results that will optimise the work of the radiologist, save their time, and improve their positioning, and to present a major benefit for the patient.

Panel discussion: What do patients, clinicians, and other stakeholders require from their experience within a radiology department?

12:30-13:30 **Room X**

ESR eHealth and Informatics Subcommittee Session

Organised by the ESR eHealth and Informatics Subcommittee

ESR eHealth

How artificial intelligence (AI) has changed radiology

ESR eHealth-1
Chairperson's introduction
E. Kotter; Freiburg/DE
Author Disclosures:
Elmar Kotter: Advisory Board: Contextflow; Share Holder: Contextflow; Speaker: Siemens Healthineers, AbbVie

ESR eHealth-2
Benefits of AI challenges to clinical practice: algorithms that won and made it to the clinic
B. Van Ginneken; Nijmegen/NL
(bram.vanginneken@radboudumc.nl)

Learning Objectives:
1. To learn about AI challenges and their organisation.
2. To understand what happens with the data collected and algorithms created during AI challenges.
3. To learn about examples of AI algorithms that made it from challenges to the clinic.
Author Disclosures:
Bram van Ginneken: Founder: Thirona; Other: Royalties from MeVis Medical Solutions, Delft Imaging, Thirona

ESR eHealth-3
How to integrate AI into the clinical workflow
T. Leiner; Utrecht/NL
(t.leiner@umcutrecht.nl)

Learning Objectives:
1. To learn how different AI systems can be integrated to support the radiological workflow.
2. To understand the benefits of integrating AI systems into the clinical routine.
3. To learn the challenges related to the AI workflow.
Author Disclosures:
Tim Leiner: Advisory Board: Cart-Tech; AI4Med; Share Holder: Quantib

ESR eHealth-4
AI in detection and classification applied to workflow prioritisation
L. Topff; Amsterdam/NL

Learning Objectives:
1. To learn how we can make use of AI to optimise radiology workflow.
2. To appreciate the impact of AI in real productivity metrics of radiologists.
3. To understand the trustworthiness of AI for first reads and worklists prioritisation.

ESR eHealth-5
Can we now trust AI models?
P. M. A. van Ooijen; Groningen/NL
(p.m.a.van.ooijen@umcg.nl)

Learning Objectives:
1. To learn about basic regulatory concepts at a European level.
2. To appreciate the different classes of medical devices.
3. To learn the key questions to ask AI providers.
Author Disclosures:
Peter M.A. van Ooijen: Speaker: Bayer

Panel discussion

12:30-13:30 **Tech Gate Auditorium**

Patients in Focus

IF 9b

Radiographers and Patients in Focus: addressing important communication challenges

Moderators
J. McNulty; Dublin/IE
E. Briers; Hasselt/BE

IF 9b-2
Introduction
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)

Learning Objectives:
1. To understand why radiographers may not always be confident, or in a position, to have difficult conversations with patients.
2. To highlight what national societies, educational institutions, and individual radiographers can do to overcome this.

IF 9b-3
The ionising radiation benefit-risk discussion: the patient's perspective
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To discuss the level of detail on radiation benefits and risks that patients wish to know about their diagnostic examinations and radiation therapy treatments.
2. To appreciate the importance of receiving real-time information from radiographers as part of the radiographer-patient interaction during examinations and procedures.

IF 9b-4
The ionising radiation benefit-risk discussion: the diagnostic radiographer's perspective
J. Portelli; Msida/MT
(jonathan.portelli@um.edu.mt)

Learning Objectives:
1. To explore the challenges associated with effective benefit-risk communication in medical imaging.
2. To discuss real-world solutions to enhancing benefit-risk communication.

IF 9b-5
The ionising radiation benefit-risk discussion: the radiotherapy/radiation therapist's perspective
E. Sundqvist; Oslo/NO
(eric@oslomet.no)

Learning Objectives:
1. To explore the challenges associated with effective benefit-risk communication in radiation therapy.
2. To discuss real-world solutions to enhancing benefit-risk communication.
Author Disclosures:
Eric Sundqvist: Employee: Oslo Metropolitan University, Faculty of Health Sciences

IF 9b-6
Open disclosure: what patients want to know about their examinations?
C. Cruwys; Glanges/FR

Learning Objectives:
1. To appreciate that patients wish to know more about their examinations than the results alone.
2. To discuss open disclosure by radiographers from the patient perspective.

IF 9b-7
The radiographer's role in open disclosure
L. A. Rainford; Dublin/IE
(louise.rainford@ucd.ie)

Learning Objectives:
1. To summarise consensus and conflict related to open disclosure in medical imaging.
2. To discuss the significance and clinical importance of open disclosure by radiographers to their patients through descriptive dialogue.

Panel discussion: Learning from each other: being educated by our patients and making sure they are fully informed

14:00-15:00 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 10R

Top tips in oncology imaging 3: protocols for genitourinary imaging

Moderator
L. Molenaar; Amsterdam/NL

Learning Objectives:
1. To describe top tips for scan protocols, patient preparation, and patient aftercare for oncologic imaging of the genitourinary system.
2. To discuss the key clinical findings, pathology, and common pitfalls for oncologic imaging of the genitourinary system.

OF 10R-2
CT urology: presentation radiographer
P. Donohoe; Dublin/IE

OF 10R-3
CT urology: presentation radiologist
T. N. Boellaard; Amsterdam/NL
(thierryboellaard@gmail.com)

Discussion

OF 10R-5
MR prostate: presentation radiographer
C. Portanier Mifsud; Msida/MT
(claude.portanier-mifsud@gov.mt)

OF 10R-6
MR prostate: presentation radiologist
S. Heijmink; Amsterdam/NL
(swheijmink@live.com)

Discussion

14:00-15:00 **Open Forum #3 (ESR)**

Open Forum Session

Organised by the ESOR

OF 10a

The era of the inevitable marriage: the radiologists and the biomedical scientist - tips and tricks to make it smooth

OF 10a-1
Chairperson's introduction
L. G. Astrakas; Ioannina/GR

OF 10a-2
The era of the inevitable marriage: the radiologists and the biomedical scientist
M. I. Argyropoulou; Ioannina/GR
(margyrop@uoi.gr)

Learning Objectives:
1. To understand the need to create a common language between the radiologist and the biomedical scientist.
2. To become familiar with the limitations of sophisticated algorithms applied in the analysis of imaging data.
3. To acquire knowledge about the impact of an interdisciplinary teamwork in handling the growing amount of imaging data.

OF 10a-3
Tips and tricks to make it smooth
J.-P. Pruvo; Lille/FR

Learning Objectives:
1. To learn how to promote collaboration between radiologists and biomedical scientists.
2. To be able to simplify complex technical and medical topics without compromising the scientific accuracy.
3. To become familiar with tools handling big imaging data.

Open forum discussion

14:00-15:00 **Room D**

Refresher Course: Radiographers

RC 1014

Simulation in radiography education and training

RC 1014-1
Chairpersons' introduction
D. Catania; Milan/IT
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)

RC 1014-2
Introduction to virtual reality (VR)
J. Ryan; Dublin/IE

Learning Objectives:
1. To define the terminology and meaning of "virtual" realities.
2. To provide an overview of the real-world usage of these technologies.
3. To discuss healthcare education applications of these technologies.

RC 1014-3
The use of moulage in teaching
N. Shiner; Derby/UK
(N.Shiner@derby.ac.uk)

Learning Objectives:
1. To describe the value of moulage as a pedagogical approach.
2. To discuss the role of moulage in creating cognitive schema and memory recall.
3. To apply a scenario whereby the introduction of moulage would enhance a simulation experience.

RC 1014-4
Simulation in radiotherapy education
J. G. Couto; Msida/MT
(jose.g.couto@um.edu.mt)

Learning Objectives:
1. To identify simulation-based education methods used in radiotherapy education.
2. To examine the evidence regarding the effectiveness of these methods.
3. To apply this knowledge to the development of simulation-based teaching activities.

RC 1014-5
Educational impact for radiography
K. Knapp; Exeter/UK
(K.M.Knapp@exeter.ac.uk)

Learning Objectives:
1. To describe the types of simulation currently available to support radiography education.
2. To examine the models of simulation training and the impact on their knowledge and clinical skills.
3. To discuss the benefits and limitations of simulation training.
Author Disclosures:
Karen Knapp: Grant recepient: Siemens, Stryker, Royal Osteoporosis Society; Research Grant/Support: Siemens, Stryker, Royal Osteoporosis Society

Panel discussion: How do we know if simulation really builds knowledge, skills, and competence?

14:00-15:00 **Room E2**

Refresher Course: Head and Neck

RC 1008

Pros and Cons: Minimal axial diameter is the leading criterion to perform an US-guided lymph node puncture in the neck

RC 1008-1
Chairperson's introduction
M. Brunner; Vienna/AT

RC 1008-2
PRO
P. De Graaf; Amsterdam/NL
(p.degraaf@vumc.nl)

Learning Objectives:
This house believes that minimal axial diameter is the leading criterion to perform an US-guided lymph node puncture in the neck.

RC 1008-3
CON
G. Madani; London/UK

Learning Objectives:
This house believes that minimal axial diameter is NOT the leading criterion to perform an US-guided lymph node puncture in the neck.

Panel discussion: The leading criterion to perform an ultrasound-guided lymph node puncture in the head and neck is the minimal axial diameter, other US-criteria or criteria provided by other modalities are less relevant

14:00-15:00 **Room M 4**

Refresher Course: Paediatric

RC 1012

Pros and Cons: Chest CT is indicated in children with suspected COVID-19

RC 1012-1
PRO
O. Kvist; Stockholm/SE
(ola.kvist@sll.se)

Learning Objectives:
This house believes that chest CT is indicated in children with suspected COVID-19.

RC 1012-2
CON
T. R. Semple; London/UK
(thomas.semple@nhs.net)

Learning Objectives:
This house believes that chest CT is NOT indicated in children with suspected COVID-19.

Panel discussion: Chest CT has a prognostic role in COVID-19/MIS-C

14:00-15:00 **Room Z**

Joint Session of the ESR and ESTRO

ESR/ESTRO

Artificial intelligence (AI): from research to clinical practice

ESR/ESTRO-1

Chairpersons' introduction
L. E. Derchi; Genoa/IT
V. Valentini; Rome/IT

Learning Objectives:
1. To learn AI workflow from research to clinics in oncology, the patient perspective.
2. To understand how we can extract evidence from AI-based studies, the validation issue.
3. To discuss benefits and challenges of future AI based oncology, decision support tool vs twin patients.

ESR/ESTRO-2

Radiomics and deep learning: the basics you need to know
N. Papanikolaou; Lisbon/PT
(nickolas.papanikolaou@research.fchampalimaud.org)

Learning Objectives:
1. To review the basic concepts of radiomics and deep learning.
2. To provide guidelines and best practices.
3. To discuss what is needed to increase the translation of radiomics to the clinical routine.

ESR/ESTRO-3

Artificial intelligence: from research to clinics
V. Valentini; Rome/IT
(vincenzo.valentini@policlinicogemelli.it)

Learning Objectives:
1. To learn about AI workflows from research to the clinics in oncology, including the patient's perspective.
2. To understand how to extract evidence from AI-based studies and the validation issue.
3. To discuss the benefits and challenges of future AI-based oncology, the decision support tool versus twin patients.

ESR/ESTRO-4

Artificial intelligence: how has it changed radiation treatment planning?
N. Nesvacil; Vienna/AT

Learning Objectives:
1. To understand the advantages of AI and machine learning applications in radiotherapy treatment planning.
2. To discuss the prerequisites for implementing AI techniques in the clinical workflow.
3. To identify new challenges for quality assurance of treatment planning for radiotherapy with AI techniques.

ESR/ESTRO-5

AI and the integration of -omics biomarkers for the prediction of response to treatment
E. Sala; Cambridge/UK

Learning Objectives:
1. To understand the limitations of conventional imaging in the evaluation of treatment response and phenotypic tumour heterogeneity.
2. To realise the advantages of AI-facilitated automatic tumour segmentation for large scale image analyses.
3. To discuss the role of radiogenomics approaches in unravelling tumour heterogeneity and predicting resistance to neo-adjuvant chemotherapy.
4. To highlight the key role of multi-omics data integration in refining treatment response assessment and outcome prediction.

Live Q&A

14:00-15:30 **Open Forum #2 (Young ECR)**

E³ - Young ECR Programme: Students Session

S 10

Best of ESR Student Abstract Submission 1

Moderator
D. Negru; Iasi/RO

S 10-2

Detection of fetal intraventricular haemorrhage – importance of EPI/T2* sequences
T. Dorittke, D. Prayer, K. Goeral, E. Krampl-Bettelheim, G. Kasprian; Vienna/AT
(tim.dorittke@meduniwien.ac.at)

Purpose: Recent studies comparing fetal neurosonography and fetal magnetic resonance imaging (MRI) claimed a similar diagnostic accuracy of both modalities in detecting fetal intraventricular haemorrhage (IVH). However, these studies and reports frequently lack systematic MR protocols including specifically blood sensitive sequences. This retrospective single-center study aimed to assess the added value of echo planar (EPI)/T2* sequences in the detection and neuroradiological workup of fetuses with suspected IVH.
Methods or Background: 108 cases with IVH were retrospectively identified by a chart review of fetal MRI examinations between 2011 to 2018. T2-weighted turbo spin-echo (T2TSE; slice thickness 2-4mm, FOV230-270mm) and EPI sequences (EPI/T2*; slice thickness 2-4mm) were separately scored by two experienced independent fetal neuroradiologists. Descriptive statistics were used to compare the diagnostic performance of both sequences.
Results or Findings: 98/108 (90.7%) cases of IVH were identified using EPI/T2*, whereas 77/108 (71.3%) of these cases showed signs of IVH on conventional T2TSE. 63 cases were scored differently, of which 29.6% were positive on EPI/T2* and negative on T2TSE. The mean IVH grade in inconsistent cases was 1.89 (SD ±1.33), with 22/63 (34.9%) of these cases showing grade I IVH and 15/63 (23.89%) showing grade II IVH.
Conclusion: Without implementing EPI/T2* sequences into the standard fetal MRI protocol, up to 29.6% of fetal IVH would remain undetected. Comparative studies need to take the higher senisitivity of EPI into account, when comparing MRI and neurosonography. The recommended minimal fetal MRI protocol must therefore include EPI/T2* sequences in order to provide additive information to fetal neurosonography.
Limitations: Due to a lack of standard of reference in the form of histologic verification or postnatal follow-up, the possibility of false-positive diagnosed IVH has to be taken into account.
Ethics committee approval: Yes (1716/2017)
Funding for this study: None
Author Disclosures:
Tim Dorittke: Nothing to disclose
Daniela Prayer: Nothing to disclose
Katharina Goeral: Nothing to disclose
Gregor Kasprian: Nothing to disclose
Elisabeth Krampl-Bettelheim: Nothing to disclose

S 10-3

Texture analysis of early unenhanced CT for identifying pancreatic parenchymal necrosis in acute pancreatitis
R. Xiao, L. Zhu, H. Xue, Z. Jin, D. Wu, Y. Yu, J. Li, W. Xiheng; Beijing/CN

Purpose: To explore whether texture analysis of unenhanced CT at the early phase can identify pancreatic parenchymal necrosis (PPN) in acute pancreatitis (AP).
Methods or Background: 55 AP patients who underwent unenhanced CT at the early phase (≤7 days after symptom onset) were retrospectively enrolled in this study, of which 21 patients developed PPN confirmed by contrast-enhanced CT at the late phase (>7 days after symptom onset). 1691 radiomics features were extracted from unenhanced CT images at the early phase to classify cases with and without PPN. LASSO-logistic model was performed to select radiomics features to construct radiomics model for identification of PPN.
Results or Findings: Out of 1691 features, Univariate analysis showed that 266 features were significant ($p<0.05$). 9 radiomics features were ultimately integrated into the radiomics model after LASSO-logistic model analysis. The classification accuracy and sensitivity of the radiomics model for identification of PPN in AP were 81.8% and 90.5% respectively. The area under the curve of the radiomics model was 0.889 (95% CI: 0.804-0.975).

Conclusion: Texture analysis of early unenhanced CT had good performance in identification of PPN in AP. Radiomics of early unenhanced CT exhibits promising application in predicting PPN in AP, which may help establish effective early treatment strategies.
Limitations: First, the single-center retrospective study and imaging methods lead to selection bias. Second, the limitation of sample size results in lack of validation cohort and more patients will be enrolled in the study in the next step. Furthermore, the radiomics result needs the interpretation of pathophysiology by the future researches in AP.
Ethics committee approval: Not available
Funding for this study: Not available
Author Disclosures:
Yang Yu: Nothing to disclose
Dong Wu: Nothing to disclose
Wang Xiheng: Nothing to disclose
Juan Li: Nothing to disclose
Ran Xiao: Nothing to disclose
Zhengyu Jin: Nothing to disclose
Liang Zhu: Nothing to disclose
Huadan Xue: Nothing to disclose

S 10-4

Severe Cerebral Small Vessel Disease Burden Associated With Brain Hypoperfusion At Baseline And Longitudinal Cognitive Decline
X. Zhang, S. Liu, X. Fan, F. Feng; Beijing/CN
(zhangxq0303@126.com)

Purpose: This study aims to evaluate the association between cerebral small vessel disease (CSVD) burden, cerebral blood flow (CBF) at baseline, and longitudinal cognitive function in cognitively intact older adults.
Methods or Background: Methods: A total of 721 volunteers were recruited. MRI was performed with 3.0T using a pseudo-continuous arterial spin labeling (pCASL) sequence for CBF analysis. MR images obtained from 392 participants were used to investigate the relationship between the severity of CSVD and CBF. Seventy-eight participants completed a telephone survey regarding cognitive function 7.6 years (± 0.1 years) after undergoing MRI. The survey evaluated their cognitive performance using the Subjective Cognitive Decline-Questionnaire 9 and their clinical history. CSVD scores were rated using a 5-grade score from 0 to 4. The severity of CSVD was classified as mild (grade≤2) and severe (grade>2). The difference in CBF between the mild and severe CSVD group was compared using univariate linear analysis, and logistic regression analysis was performed to assess the risk of longitudinal cognitive function.
Results or Findings: Severe CSVD burdens were associated with significantly smaller CBF in multiple cortical regions and some deep nucleus (PFDR< 0.05, corrected for age and sex). Compared with participants with mild CSVD, participants with severe CSVD were more susceptible to longitudinal cognitive decline (OR= 3.375, p= 0.001, corrected for age, sex, education years, and MMSE).
Conclusion: Severe CSVD burden, which is associated with smaller CBF, serves as an imaging marker of predicting cognitive decline.
Limitations: We did not design a strict follow-up schedule at the beginning of the cohort and follow up regularly every few years.
Ethics committee approval: Approved by Institutional review board of PUMCH.
Funding for this study: Partially supported by the Ministry of Science and Technology of People's Republic of China (2016YFC1305901 and 2019YFA0707103) and (CIFMS #2017-I2M-3-008)
Author Disclosures:
Feng Feng: Nothing to disclose
Sirui Liu: Nothing to disclose
Xiaoqian Zhang: Nothing to disclose
Xiaoyuan Fan: Nothing to disclose

S 10-5

Predicting the occurrence of artifacts in the subtraction images of DCE breast MRI before starting contrast agent administration by using artificial neural network
B. K. Das, A. Liebert, L. A. Kapsner, S. Ohlmeyer, F. B. Laun, M. Uder, A. Maier, E. Wenkel, S. Bickelhaupt; Erlangen/DE
(Badhan.das@fau.de)

Purpose: To assess the capability of a neural network to predict the occurrence of image artifacts in DCE-derived subtraction series immediately before starting the administration of the intravenous contrast agent.
Methods or Background: This IRB-approved retrospective study included n=2259 breast MRI examinations (1.5/3T, Siemens-Healthineers, Germany) with the full diagnostic protocol (T1,T2,DWI,DCE) from the clinical routine. T1-weighted-DCE subtraction derived maximum intensity projection images (MIPs) were used to visually classify the presence of image artifacts by an experienced reader(10y experience). The dataset was split into training, validation, and test set with 1600, 400, and 259 samples respectively. The initial unenhanced T1-weighted acquisition immediately before contrast agent administration was used as input for a modified ResNet and ResNext model in order to predict the presence of artifacts on following DCE subtraction images. F1 score was used to evaluate the performance of these models.
Results or Findings: When analyzing the n=2259 breast MRI examinations, the network demonstrated, that a maximum F1 score of 0.8235 can be reached with a sensitivity of 0.8225 and specificity of 0.8246 for predicting the occurrence of artifacts based on the non-contrast T1-weighted sequence acquired immediately prior to the start of contrast agent administration.
Conclusion: A neural network was able to predict artifacts occurring in the DCE subtraction MIP immediately prior to the start of administration of contrast agents by analyzing the unenhanced T1-weighted acquisition. Further research is justified to investigate the capability to use such techniques in a clinical workflow.
Limitations: The study was performed retrospectively using only data from a single vendor. Further generalization of the method should be investigated.
Ethics committee approval: This retrospective study was approved by the ethics committee of University Clinic Erlangen.
Funding for this study: The financial support of BMBF GoBioInitial project "SMART SELECT MR" is gratefully acknowledged.
Author Disclosures:
Lorenz A. Kapsner: Nothing to disclose
Andreas Maier: Nothing to disclose
Evelyn Wenkel: Nothing to disclose
Badhan Kumar Das: Nothing to disclose
Frederik Bernd Laun: Nothing to disclose
Michael Uder: Nothing to disclose
Sabine Ohlmeyer: Nothing to disclose
Sebastian Bickelhaupt: Research/Grant Support: The university hospital erlangen receives funding from Siemens Healthineers for various cooperation projects (not related to this research), partially contributing to the job position. Patent Holder: Multiple patents in MRI pending Speaker: Lecture fees from Siemens Healthineers Grant Recipient: The financial support of BMBF GoBioInitial project "SMART SELECT MR" is gratefully acknowledged.
Andrzej Liebert: Nothing to disclose

S 10-6

Percentile-based averaging and skeletal muscle gauge improve body composition analysis: Validation at multiple vertebral levels.
J. P. Marquardt[*1], E. Roeland[2], E. van Seventer[3], T. D. Best[3], N. Horick[3], R. Nipp[3], F. J. Fintelmann[3]; [1]Aachen/DE, [2]Portland, OR/US, [3]Boston, MA/US
(peter.marquardt@rwth-aachen.de)

Purpose: Skeletal muscle measurements on CT predict patient outcomes. We hypothesize that aggregating measurements from multiple vertebral levels and skeletal muscle gauge (SMG) better predict outcomes than -radioattenuation (SMRA) or -index (SMI) at a single level.
Methods or Background: We analyzed prospectively collected outcomes (overall survival, hospital readmission, time to unplanned hospital readmission or death, readmission or death within 90 days, Edmonton Symptom Assessment Scale, and Patient Health Questionnaire) of patients with advanced cancer with an unplanned admission to Massachusetts General Hospital from 2014-2016. We segmented skeletal muscle at the following thoracic (T) or lumbar (L) vertebral levels: T5, T8, T10, and L3 on CT scans obtained ≤50 days before hospitalization. We aggregated measurements across available levels using percentile-based averaging (PBA). We constructed one regression model adjusted for age, sex, sociodemographic factors, cancer type, body mass index, and intravenous contrast for each combination of (1) vertebral level, (2) muscle metric (SMRA, SMI, SMG), and (3) outcome. We compared the performance of levels and metrics by ranking otherwise identical models by Concordance statistic (C-statistic), number of included patients (N), coefficient of determination (R^2), and significance of muscle metric (p-value).
Results or Findings: We included 846 patients (mean age: 63.5±12.9 years, 50.5% males). PBA increased inclusion by 8-47%. PBA outperformed single-level analyses with average ranks 2.6, 2.9, and 1.6 for C-statistic, R^2, and p-value (range 1-5, μ=3), respectively. SMG outperformed SMRA and SMI with average ranks 1.4, 1.4, and 1.4 for C-statistic, R^2, and p-value (range 1-3, μ=2), respectively.
Conclusion: Multi-level analyses using PBA and SMG outperform analyses using individual levels and SMRA or SMI.
Limitations: This study is a secondary, single-center analysis.
Ethics committee approval: The Dana Farber/Harvard Cancer Center Institutional Review Board approved this study.
Funding for this study: This study did not receive external funding.
Author Disclosures:
Emily van Seventer: Nothing to disclose
Ryan Nipp: Nothing to disclose
Nora Horick: Nothing to disclose
Eric Roeland: Advisory Board: Heron Pharmaceuticals, Vector Oncology, and Helsinn Pharmaceuticals Consultant: Mitobridge Inc., Asahi Kasei Pharmaceuticals, DRG Consulting, Napo Pharmaceuticals, American Imaging

Management, Immuneering Corporation, and Prime Oncology Other: Oragenics, Inc, Galera Pharmaceuticals, and Enzychem Lifesciences Pharmaceutical Company
Till D. Best: Nothing to disclose
Florian J. Fintelmann: Other: Related patent pending Research/Grant Support: American Roentgen Ray Society
J. Peter Marquardt: Nothing to disclose

S 10-7

Brain Responses to Four Basic Mathematical Operations in Children 10-12 Years: An fMRI Study

A. Istomina, A. Faber, M. Arsalidou, A. Manzhurtsev, M. Ublinskiy; Moscow/RU

Purpose: Four basic mathematical operations: addition, subtraction, multiplication, and division are fundamental to our day-to-day calculations. Although many studies examine brain correlates of math cognition few consider all four mathematical operations together. We examine for the first time using functional magnetic resonance imaging (fMRI) brain activity associated with addition, subtraction, multiplication and division with three difficulty levels in children.
Methods or Background: Participants (n = 15, 7 females; 10–12 years) performed the Parametric Math Task (PMT) while their brain activity was recorded using a magnetic resonance Philips Achieva dStream 3.0T scanner. The PMT contains four basic mathematical operations with three levels of difficulty each indexed by 1-digit, 2-digit, 3-digit numbers and three control conditions. Conditions appear blocks that lasts 32 seconds, and during this time-period participants were asked to give as many correct answers as possible. Data processing and analysis of MRI data were carried out using AFNI software.
Results or Findings: Preliminary data show that common areas of brain activity across mathematical operations. Math problem difficulty is expressed by increased activity in the frontal cortex. When the task becomes more complex, activation is observed in the right inferior parietal (right precuneus), left and right superior frontal regions for all math operation; difficult addition problems also engage more insular cortex.
Conclusion: Brain responses are modulated by more by difficulty rather than mathematical operation. As difficulty increase brain activation is more extensive, which points to a common system for core cognitive processes.
Limitations: Motion is the most prevalent artifact, especially in pediatric samples.
Ethics committee approval: The local ethics committee approved all materials and procedures.
Funding for this study: Russian Science Foundation #17-18-01047.
Author Disclosures:
Asya Istomina: Nothing to disclose
Maxim Ublinskiy: Nothing to disclose
Andrei Faber: Nothing to disclose
Marie Arsalidou: Nothing to disclose
Andrei Manzhurtsev: Nothing to disclose

S 10-8

Pre-treatment metastatic site-specific metabolic tumour volume is associated with clinical endpoints in patients with NSCLC receiving immunotherapy

D. Kifjak[1], L. Beer[1], A. Haug[1], M. Mayerhoefer[2], R. Ambros[1], M. Hochmair[1], H. Prosch[1]; [1]Vienna/AT, [2]New York, NY/US
(daria.kifjak@umassmemorial.org)

Purpose: To evaluate the prognostic value of metastatic site-specific pre-treatment metabolic tumour burden using 18F-FDG-PET-CT in patients with advanced non-small-cell lung cancer (NSCLC) treated with PD-1/PD-L1 inhibitors.
Methods or Background: This prospective, single-centre study included 87 patients who underwent 18F-FDG PET-CT before PD-1/PD-L1 inhibitor treatment initiation. We semi-automatically extracted the following parameters: TLG (total lesion glycolysis) and MTV (metabolic tumour volume) for all malignant lesions. TLG and MTV were then separately extracted for each anatomic site (e.g. intrapulmonary lesions, lymph nodes, bone lesions). Each parameter was dichotomised using the median as a threshold. We compared progression-free survival (PFS) and overall survival (OS) using the Kaplan-Meier test and Cox regression analysis.
Results or Findings: Median follow up was 11 months (range 1-63 months). High total baseline TLG and high total baseline MTV were associated with decreased PFS and OS. Particularly, a TLG >690 SUV*ml and an MTV>112ml were significantly associated with decreased median PFS (5 months vs. 9 months, p=0.024; 3 months vs. 9 months, p<0.001) and OS (9 months vs 20 months, p=0.002; 11 months vs. median not met, p<0.001). In the univariate analysis, total baseline TLG, MTV as well as bone metastasis TLG were associated with a decreased PFS (p=0.006; p<0.001; p<0.001) and OS (all p<0.001).
Conclusion: Pre-treatment total and bone metastasis metabolic tumour burden correlates with progression-free survival and overall survival in patients with advanced NSCLC treated with PD-1/PD-L1 inhibitors.
Limitations: Single-center study.
Ethics committee approval: The study was approved by the local ethics committee (approval # 1521/2015).
Funding for this study: No funding.
Author Disclosures:
MaximilianJohannes Hochmair: Nothing to disclose
Alexander Haug: Nothing to disclose
Raphael Ambros: Nothing to disclose
Helmut Prosch: Nothing to disclose
Lucian Beer: Nothing to disclose
Marius Mayerhoefer: Nothing to disclose
Daria Kifjak: Nothing to disclose

S 10-9

Radiological evaluation of breast subcutaneous tissue thickness and correlation with postoperative complications in breast reconstruction after tissue-sparing mastectomies.

S. Marello, M. Durando, P. M. Ferrando, C. Dianzani, G. Bartoli, E. Regini, L. Bergamasco, F. Malan, P. Fonio; Torino/IT
(marello.silviasm@gmail.com)

Purpose: Ischemic complications after tissue-sparing mastectomy have been associated with multiple variables, including skin flap thickness. Preoperative breast imaging, such as mammography and MRI, can be useful determining subcutaneous tissue thickness, facilitating surgical planning for heterologous reconstruction in tissue-sparing mastectomies. We analyzed the relationship between subcutaneous tissue thickness and clinical data (BMI, patient age, breast volume and density) and postoperative complications (skin necrosis).
Methods or Background: This retrospective study included 82 patients diagnosed with breast cancer who underwent tissue-sparing mastectomy between June 2017-April 2021. In all patients, subcutaneous tissue thickness was preoperatively determined on mammogram (CC and MLO projection) and MRI (axial and sagittal images), obtaining for each breast 12 measurements in the anterior, median, and posterior area, and the outer, inner, upper and lower side, respectively. The thickness measured was compared with clinical data and complications.
Results or Findings: The average total subcutaneous tissue thickness measured on mammography was 13.5±5.35mm, on MRI 14±4.47mm. Comparing measurements obtained through Wilcoxon test, no statistically significant differences (p=0.15) emerged between the two imaging methods. The increase of subcutaneous tissue thickness was significantly related to the increase in breast volume (p<0.0001) and BMI (p<0.0001). No-dense breasts were associated with larger thickness than dense ones (p<0.0001); there was no significant correlation with patient age. Skin necrosis, that was found in 10(12%) patients, was significantly associated with BMI>26 (p<0.01) and larger thickness (p<0.03).
Conclusion: Measurements carried out with mammography and MRI showed no statistically significant differences, so they both represent effective methods for assessing subcutaneous thickness. Subcutaneous thickness increase seems to be correlated with increasing BMI and breast volume, and with no-dense breasts too. Skin necrosis seems to be associated with greater thickness of subcutaneous tissue.
Limitations: Retrospective study
Small sample
Ethics committee approval: Not required
Funding for this study: No funding
Author Disclosures:
Chiara Dianzani: Nothing to disclose
Pietro Maria Ferrando: Nothing to disclose
Manuela Durando: Nothing to disclose
Fabrizio Malan: Nothing to disclose
Silvia Marello: Nothing to disclose
Elisa Regini: Nothing to disclose
Laura Bergamasco: Nothing to disclose
Germana Bartoli: Nothing to disclose
Paolo Fonio: Nothing to disclose

S 10-10

Fully Automated 3D Body Composition measurements associated with survival in Head and Neck Squamous Cell Carcinoma patients.

M. Rozynek[1], D. Gut[1], I. Kucybała[1], E. Strzałkowska-Kominiak[2], Z. Tabor[1], W. Wojciechowski[1]; [1]Krakow/PL, [2]Warsaw/PL
(miloszrozynek@gmail.com)

Purpose: Head and Neck Squamous Cell Carcinoma (HNSCC) patients are at high risk of disturbed body composition, which could lead to worse clinical outcomes. In our study we verified if 3D body composition measurements acquired using deep-learning methods are significant for overall survival.

Methods or Background: 3D segmentation of abdominal tissues including spine, spine muscles, abdominal muscles, subcutaneous adipose tissue (SAT), visceral adipose tissue (VAT), and internal organs within volumetric region limited by L1 and L5 levels was accomplished using deep convolutional segmentation architecture - U-net implemented in a nnUnet framework. It was trained on separate dataset of 560 single-channel CT slices and used for 3D segmentation of pre-radiotherapy (Pre-RT) and post-radiotherapy (Pos-RT) whole body PET-CT or abdominal CT scans of 215 HNSCC patients. Overall survival analysis was conducted using Cox proportional hazard model.
Results or Findings: Our model was successful at segmentation with Dice's coefficient exceeding 0.95. The 3D measurements including difference between Pre-RT and post-RT abdomen and spine muscles percentage, difference between Pre-RT and post-RT VAT percentage and sum of Pre-RT abdomen and spine muscles percentage together with BMI and Cancer Site were selected as significant at the level of 5% for the overall survival. Aside from Cancer Site, the lowest hazard ratio (HR) value (HR, 0.7527; 95% CI, 0.6487-0.8735; p = 0.000183) was observed for the difference between Pre-RT and post-RT abdomen and spine muscles percentage sum. Two dimensional measurements of both muscle and adipose tissue area were not significantly associated with overall survival.
Conclusion: Fully automated 3D quantitative measurements of body composition are significant for overall survival in HNSCC patients.
Limitations: In order to fully describe body composition characteristics, further research incorporating qualitative analysis needs to be conducted.
Ethics committee approval: n/a
Funding for this study: n/a
Author Disclosures:
Wadim Wojciechowski: Nothing to disclose
Daniel Gut: Nothing to disclose
Ewa Strzałkowska-Kominiak: Nothing to disclose
Iwona Kucybała: Nothing to disclose
Zbislaw Tabor: Nothing to disclose
Miłosz Rozynek: Nothing to disclose

S 10-11
Less is more: The introduction of a focused diffusion-weighted magnetic resonance imaging (DWI-MRI) protocol to evaluate patients admitted with acute stroke to Sligo University Hospital
M. Ni Mhiochain de Grae[*1], P. Hickey[2], K. James[2], D. P. Mitchell[2]; [1]Galway/IE, [2]Sligo/IE
(m.nimhiochaindegrae1@nuigalway.ie)

Purpose: In Sligo University Hospital(SUH) in August 2019, a focused diffusion-weighted imaging(DWI) only stroke MRI protocol was introduced as an option for acute stroke imaging, in addition to the standard inpatient MRI brain study protocol. We sought to assess the impact of this new protocol option.
Methods or Background: Single institution retrospective study assessing adult inpatients admitted for acute stroke. We compared group 1 including acute stroke patients admitted from 1/5/19 to 31/7/19 and group 2 including patients admitted from 1/9/19 to 30/11/19. Haemorrhagic strokes excluded. Data collected using SUH stroke register and NIMISPACS.
Results or Findings: Group 1(49 patients); 28.6%(14/49) initial CT brain positive for acute infarction, 49%(24/49) had subsequent standard protocol MRI brains(100% positive). Group 2(54 patients); 33.3%(18/54) initial CT brain positive for acute infarction (compared to group 1; p-value=0.12). 50%(27/54) of group 2 patients had subsequent MRI; either focused DWI or standard protocol. 51.9%(14/27) of group 2 patients had focused DWI protocol (100% positivity), no patients required further MRI sequences. 93%(13/14) of DWI studies had preceding negative CT. 48%(13/27) had standard MRI protocol with 69%(9/13) positive. No statistically significant difference in pre-stroke or discharge modified-Rankin scores between groups (p values=0.66,0.34 respectively). Focused-DWI protocol resulted in 91% decrease in scan time.
Conclusion: Introduction of a focused DWI-only MRI protocol for the work-up of acute stroke resulted in more patients being scanned in less time.
Limitations: Single institution, retrospective study, single scanner and a relatively small sample. We used our local stroke registry to define our groups of acute stroke patients. However, not all patients presenting with acute neurology were clinically diagnosed with stroke at discharge therefore would not have been included in the stroke registry.
Ethics committee approval: Ethical approval was received from the local ethics committee.
Funding for this study: NUIG Medical School
Author Disclosures:
David Patrick Mitchell: Nothing to disclose
Meadhbh Ni Mhiochain de Grae: Nothing to disclose
Karl James: Nothing to disclose
Paula Hickey: Nothing to disclose

14:00-15:30 **Room A**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

Jointly organised by the ESR, ESSO, and ESTRO

E³ 1019a

Rectal cancer: a multidisciplinary approach

E³ 1019a-1
Chairperson's introduction
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To understand which questions are clinically relevant.
2. To learn about the relevant MRI findings and their impact on treatment choice.
3. To learn about new treatment strategies, including organ preservation.
4. To understand the role of MRI for selection and follow up.

E³ 1019a-2
Lessons from the surgeon
G. L. Beets; Amsterdam/NL
(g.beets@nki.nl)

E³ 1019a-3
Lessons from the radiation oncologist
M. A. Gambacorta; Rome/IT
(mariaantonietta.gambacorta@policlinicogemelli.it)

E³ 1019a-4
Lessons from the radiologist: case-based discussion
R. G. H. Beets-Tan; Amsterdam/NL

14:00-15:30 **Room B**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1019b

Breast cancer staging and monitoring with imaging: a multidisciplinary approach

E³ 1019b-1
Chairperson's introduction
R. M. Mann; Nijmegen/NL
(r.mann@rad.umcn.nl)

Learning Objectives:
1. To recognise the key imaging features that are essential for the choice of therapy.
2. To discuss the potential benefits and risks of supplemental imaging.
3. To understand when and how to image patients on neoadjuvant systemic therapy.
Author Disclosures:
Ritse M. Mann: Advisory Board: Screenpoint, Bayer, Siemens, BD; Board Member: EUSOBI

E³ 1019b-2
Advanced breast cancer staging and monitoring of response to neoadjuvant therapy
K. Pinker-Domenig; New York, NY/US
(pinkerdk@mskcc.org)

E³ 1019b-3
Planning breast cancer surgery: what radiologists need to know
F. Meani; Lugano/CH
(drfmeani@gmail.com)

E³ 1019b-4
Selection and monitoring of patients for neoadjuvant systemic therapy
M. Kok; Amsterdam/NL
(M.kok@nki.nl)
Author Disclosures:
Marleen Kok: Advisory Board: AZ/Daiichi, BMS, Medscape, MSD, Roche; Research Grant/Support: AZ/Daiichi, BMS, Roche; Speaker: Gilead

E³ 1019b-5
Multidisciplinary tumour board: case-based panel discussion
R. M. Mann; Nijmegen/NL
(r.mann@rad.umcn.nl)
Author Disclosures:
Ritse M. Mann: Advisory Board: Screenpoint, Siemens, Bayer, BD; Board Member: EUSOBI

14:00-15:30 **Room C**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1019c

Multidisciplinary management of acute ischaemic stroke: beyond current guidelines

E³ 1019c-1
Chairperson's introduction
A. Krajina; Hradec Kralove/CZ
(antonin.krajina@fnhk.cz)

Learning Objectives:
1. To know current guidelines of stroke treatment and its grey areas.
2. To understand the various clinical and imaging options available for patient selection.
3. To understand the concept of personalized medicine in this context.

E³ 1019c-3
Medium vessel occlusions; how distal should we go? The interventional radiologist's perspective
R. Chapot; Essen/DE
(rene.chapot@krupp-krankenhaus.de)

E³ 1019c-4
Basilar artery occlusion with mild neurological deficit (NIHSS <10), the neurologist's perspective
P. Michel; Lausanne/CH
(patrik.michel@chuv.ch)
Author Disclosures:
Patrik Michel: Grant recepient: Swiss National Science Foundation; Swiss Heart Foundation

E³ 1019c-5
Multidisciplinary case-based panel discussions
A. Krajina; Hradec Kralove/CZ
(antonin.krajina@fnhk.cz)

14:00-15:30 **Room F1**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESR

BS 10

Abdominal viscera: imaging the pancreas

Moderator
I. G. Lupescu; Bucharest/RO

BS 10-2
Imaging pancreatitis
C. Triantopoulou; Athens/GR
(ctriantopoulou@gmail.com)

Learning Objectives:
1. To present the current imaging techniques for the evaluation of pancreatitis.
2. To describe the typical features of pancreatitis.

BS 10-3
Imaging pancreatic cystic lesions
A. Palkó; Szeged/HU
(palkoand@gmail.com)

Learning Objectives:
1. To present the current imaging techniques for the evaluation of pancreatic cystic lesions.
2. To become familiar with the typical findings of pancreatic cystic lesions.

BS 10-4
Imaging pancreatic solid masses
L. Curvo-Semedo; Coimbra/PT
(curvosemedo@gmail.com)

Learning Objectives:
1. To present the current imaging techniques for pancreatic solid masses.
2. To become familiar with the typical findings of pancreatic solid masses.

14:00-15:30 **Room G**

E³ - Advanced Courses: Cancer Imaging

E³ 1018

Multimodality imaging of tumour heterogeneity in cancer treatment: a multidisciplinary approach

E³ 1018-1
Chairperson's introduction
C. C. Cyran; Munich/DE

Learning Objectives:
1. To define the concept of tumour heterogeneity and its role in future therapeutic strategies in oncology.
2. To discuss the pathological hallmarks of clonal heterogeneity and their underlying pathophysiological relevance.
3. To explore multimodality imaging biomarkers of tumour heterogeneity in vivo and their potential for therapy guidance.
4. To discuss the potential of integrated multi-diagnostic biomarkers for guiding therapy in oncology.

E³ 1018-2
The oncologist: the rationale of tumour heterogeneity in oncology
M. Schmidinger; Vienna/AT
(Manuela.schmidinger@meduniwien.ac.at)
Author Disclosures:
Manuela Schmidinger: Advisory Board: BMS MERCK MSD IPSEN EXELIXIS EISAI EUSA JANSSEN ALKERMES; Grant recepient: IPSEN; Investigator: MSD BMS EISAI; Research Grant/Support: IPSEN; Speaker: IPSEN BMS MSD EISAI

E³ 1018-3
The pathologist: pathological assessment and measures of clonal heterogeneity
F. Pedica; Milan/IT
(pedica.federica@hsr.it)

E³ 1018-4
Multimodality imaging of tumour heterogeneity
C. C. Cyran; Munich/DE

E³ 1018-5
Case-based panel discussion: Integrated biomarkers of tumour heterogeneity for guiding oncological therapy
C. C. Cyran; Munich/DE

14:00-15:30 **Room K**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1019d

The memory clinic: a multidisciplinary approach

E³ 1019d-1
Chairperson's introduction
M. Vernooij; Rotterdam/NL

Learning Objectives:
1. To learn about the main subtypes of dementia.
2. To understand the multidisclipinary approach to diagnosing and treating dementia.
3. To learn about the role of imaging in diagnosing dementia subtypes.

E³ 1019d-2
A changing diagnostic paradigm of Alzheimer's disease
W. van der Flier; Amsterdam/NL
Author Disclosures:
Wiesje van der Flier: Advisory Board: WF participated in advisory boards of Biogen MA Inc and Roche. All funding is paid to her institution.; Board Member: WF was associate editor of Alzheimer, Research & Therapy in 2020/2021. WF is associate editor at Brain.; Employee: Amsterdam UMC; Research Grant/Support: Research programs of Wiesje van der Flier have been funded by ZonMW, NWO, EU-FP7, EU-JPND, Alzheimer Nederland, Hersenstichting CardioVascular Onderzoek Nederland, Health~Holland, Topsector Life Sciences & Health, stichting Dioraphte, Gieskes-Strijbis fonds, stichting Equilibrio, Edwin Bouw fonds, Pasman stichting, stichting Alzheimer & Neuropsychiatrie Foundation, Philips, Biogen MA Inc, Novartis-NL, Life-MI, AVID, Roche BV, Fujifilm, Combinostics. WF holds the Pasman chair. WF is recipient of ABOARD, which is a public-private partnership receiving funding from ZonMW (#73305095007) and Health~Holland, Topsector Life Sciences & Health (PPP-allowance; #LSHM20106). All funding is paid to her institution. WF has performed contract research for Biogen MA Inc, and Boehringer Ingelheim. All funding is paid to her institution.; Speaker: WF has been an invited speaker at Boehringer Ingelheim, Biogen MA Inc, Danone, Eisai, WebMD Neurology (Medscape), Springer Healthcare. All funding is paid to her institution.; Other: WF is member of the steering committee of PAVE, and Think Brain Health.

E³ 1019d-3
The role of CT, MRI, and PET in the memory clinic
S. Haller; Geneva/CH
(sven.haller@gmail.com)
Author Disclosures:
Sven Haller: Advisory Board: EPAD imaging advisory board

E³ 1019d-4
Current treatment options for dementia: lessons from the neurologist
N. Fox; London/UK
Author Disclosures:
Nick Fox: Advisory Board: Roche, Eli Lilly, Ionis, Biogen; Other: Member of a Data Safety Monitoring Board for Biogen

E³ 1019d-5
Multidisciplinary team meeting: case-based panel discussion
M. Vernooij; Rotterdam/NL
(m.vernooij@erasmusmc.nl)

14:00-15:30 **Room M 3**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

Jointly organised by the ESR and ESSO

E³ 1019e

Response evaluation in breast cancer treatment: a multidisciplinary approach

E³ 1019e-1
Chairperson's introduction
P. Clauser; Vienna/AT
(clauser.p@hotmail.it)

Learning Objectives:
1. To understand the surgical considerations for changing breast treatment from mastectomy to breast conservative surgery after NAC and reflect how imaging can help making treatment decisions in two patients with NAC.
2. To know the strengths and weaknesses of imaging modalities with respect to response monitoring of breast cancer patients treated with neoadjuvant chemotherapy.
3. To learn about the most important studies on the early prediction of response to treatment and understand the clinical implications of the studies.
Author Disclosures:
Paola Clauser: Speaker: Siemens Healtineers

E³ 1019e-2
Assessment after neoadjuvant chemotherapy (NAC): what the surgeon needs to know
I. T. Rubio; Madrid/ES
(irubior@unav.es)
Author Disclosures:
Isabel T. Rubio: Speaker: Sirius, MSD, Agendia

E³ 1019e-3
Ultrasound, contrast-enhanced mammography, and MRI after neoadjuvant chemotherapy: rivals or allies?
M. B. I. Lobbes; Maastricht/NL
(marc.lobbes@mumc.nl)
Author Disclosures:
Marc B.I. Lobbes: Advisory Board: GE Healthcare, Bayer, Guerbet, Hologic; Grant recepient: GE Healthcare; Speaker: GE Healthcare, Bayer, Guerbet, Tromp Medical

E³ 1019e-4
Early prediction of response to treatment: current evidence and future perspectives
H. Preibsch; Tübingen/DE
Author Disclosures:
Heike Preibsch: Advisory Board: Bayer; Research Grant/Support: GE Healthcare

E³ 1019e-5
Case based panel discussions: evaluation of breast cancer response to therapy, which is the best way?
P. Clauser; Vienna/AT
(clauser.p@hotmail.it)
Author Disclosures:
Paola Clauser: Speaker: Siemens Healthineers

14:00-15:30 **Room M 5**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1019f

Neuroblastoma: a multidisciplinary approach

E³ 1019f-1
Chairpersons' introduction
F. Gómez Muñoz; Barcelona/ES
(fernan.m.gomez@gmail.com)
P. Patel; London/UK

Learning Objectives:
1. To stress the importance of the multidisciplinary management of children suffering neuroblastoma.
2. To review the newest strategies for the multidisciplinary approach in the treatment of neuroblastoma including systemic and local treatments.
3. To discuss imaging findings and treatment response assessment of neuroblastoma and how to provide surgeons, pediatric medical oncologists, radiation oncologist and interventional radiologists with the best treatment plan.

E³ 1019f-2
Imaging of neuroblastoma: the radiologist's perspective
I. Barber; Esplugues de Llobregat/ES
(ibarber@hsjdbcn.org)

E³ 1019f-3
Systemic treatment and radiation therapy of neuroblastoma: the oncologist's perspective
J. Mora; Barcelona/ES
(jaume.mora@sjd.es)
Author Disclosures:
Jaume Mora: Advisory Board: Ymabs Therapeutics

E³ 1019f-4
Surgery for the management of neuroblastoma: the surgeon's perspective
M. P. Martín Giménez; Barcelona/ES

E³ 1019f-5
Interventional radiology in treatment of neuroblastoma: the interventional radiologist's perspective
F. Gómez Muñoz; Barcelona/ES
(fernan.m.gomez@gmail.com)

E³ 1019f-6
Case-based discussions
F. Gómez Muñoz; Barcelona/ES
(fernan.m.gomez@gmail.com)
P. Patel; London/UK

14:00-15:30 **Room N**

Special Focus Session

SF 10a

Normal or abnormal cardiac imaging

SF 10a-1
Chairperson's introduction
H. Alkadhi; Zurich/CH

SF 10a-2
The spectrum of normal cardiac appearances in athletes
B. K. Velthuis; Utrecht/NL
(b.k.velthuis@umcutrecht.nl)

Learning Objectives:
1. To learn to use the wide spectrum of gender and sport type specific upper normal limits of an athlete's heart.
2. To understand the difference between a normal balanced adaptation versus an abnormal adaptation of the athlete's heart.
3. To recognise the overlap between the athlete's heart and known cardiomyopathies such as dilating, hypertrophic, non-compaction, and arrhythmogenic (right ventricular) cardiomyopathy.

SF 10a-3
The normal ageing heart
M. Hrabak Paar; Zagreb/HR
(maja.hrabak.paar@mef.hr)

Learning Objectives:
1. To understand changes in cardiac structure and function in older individuals.
2. To define the role of coronary CT angiography in elderly patients.
3. To depict normal MRI findings of the ageing cardiovascular system.

SF 10a-4
Adults with congenital heart disease
A. Secinaro; Rome/IT
(aurelio.secinaro@opbg.net)

Learning Objectives:
1. To understand the prevalence and distribution of "grown-up" congenital heart disease in adults.
2. To explain the change of the diagnostic paradigm for adult congenital heart patients towards a less invasive, reproducible, and accurate imaging approach based on MRI and CT.
3. To illustrate the pivotal role of cardiac radiologists in the GUCH Heart Team.
4. To provide basic knowledge of how to scan cardiac malformations that may present at any adult centre.

Panel discussion: Normal or pathological heart? That is the question

14:00-15:30 **Room O**

New Horizons Session

Jointly organised by the ESR and EFLM

NH 10

Integrated diagnostics: evidence-based therapy guidance in oncology

NH 10-1
Chairpersons' introduction
D. Regge; Turin/IT
(daniele.regge@ircc.it)
T. Ozben; Antalya/TR

NH 10-2
From tumour markers to liquid biopsy
T. Ozben; Antalya/TR
(ozben@akdeniz.edu.tr)

Learning Objectives:
1. To provide an overview of the different circulating tumour markers available for cancer care.
2. To summarise the role of tumour markers in detecting cancer, assessing response to cancer therapy, and identifying residual disease.
3. To review the present and future role of liquid biopsy in cancer therapy guidance.

NH 10-3
Imaging cancer at a cellular and sub-cellular resolution
C. Marchiò; Candiolo/IT
(caterina.marchio@ircc.it)

Learning Objectives:
1. To gain insight on the wealth of data coming from tissue sample analysis, such as morphology, immunohistochemistry, and molecular pathology.
2. To understand the value of emerging tissue biomarkers in oncology.
3. To describe how digital pathology and artificial intelligence will enhance precision in cancer therapy guidance.
Author Disclosures:
Caterina Marchiò: Advisory Board: Personal consultancy fees from Bayer, Roche Daiichi Sankyo, Astrazeneca

NH 10-4
Oncologic decision support systems from a radiologist's perspective
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)

Learning Objectives:
1. To describe the role of diagnostic imaging in guiding the cancer treatment decision-making process.
2. To summarise the importance of integrating imaging biomarkers with other tumour biomarkers for therapy guidance.
3. To review the state of the art of oncologic clinical support systems that integrate imaging information.

NH 10-5
Precision cancer therapy: making sense of it all
S. Marsoni; Milan/IT

Learning Objectives:
1. To understand that precision oncology is not just targeted therapy.
2. To appreciate the potential of a precision oncology approach in cancer research and in clinical practice.
3. To understand the power of integrated diagnostics for patient selection.

Panel discussion: Sharing clinical decisions in cancer care

14:15-15:45 **Tech Gate Auditorium**

Patients in Focus

IF 10
Switching roles: the experiences and expectations of patients

Moderators
D.-G. Carrié; Toulouse/FR
A. Brady; Cork/IE

IF 10-2
Presentation of the 'Patient Expectations' paper
C. Cruwys; Glanges/FR

Learning Objectives:
1. To learn, in a playful way, the experiences of patients in the radiology department: good, less good, and perhaps even funny.
2. To understand that the interaction between staff and patient will have an impact on the patient and can even lead to undesired "side-effects".
3. To appreciate that listening, open-mindedness, and observation of patients will lead to a better understanding of the needs of patients and an improvement in service and care.

IF 10-3
Introduction to patient stories
A. Brady; Cork/IE

Learning Objectives:
1. To learn about the changing role of the radiologist, moving closer to the clinicians and patients.
2. To understand that the same story can be positive for the patient and at the same time "negative" for the radiologist/radiographer.
3. To appreciate that, every now and then, even in a serious department, something funny can happen.

IF 10-4
Judy's story
J. Birch; Poole/UK

IF 10-5
Adrian's story
A. Brady; Cork/IE
(adrianbrady@me.com)

IF 10-6
Erik's story
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

IF 10-7
Cheryl's story
C. Cruwys; Glanges/FR

IF 10-8
Dominique's story
D.-G. Carrié; Toulouse/FR
(dominiquecarrie@wanadoo.fr)

IF 10-9
Joliene's story
J. Munier; Eindhoven/NL

IF 10-10
Caroline's story
C. Justich; Vienna/AT
(cjustich@me.com)

IF 10-11
Panel discussion: What are the expectations of the patient and are they being met?
C. Beardmore; London/UK
(CharlotteB@sor.org)

16:00-17:00 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 11R
Top tips in oncology imaging 4: protocols for breast imaging

Moderator
L. Molenaar; Amsterdam/NL

Learning Objectives:
1. To describe top tips for scan protocols, patient preparation, and patient aftercare for oncologic imaging of the breast.
2. To discuss the key clinical findings, pathology, and common pitfalls for oncologic imaging of the breast.

OF 11R-2
CT mammary and perforating arteries and veins: presentation radiographer
S. Ertugrul; Amsterdam/NL
(s.ertugrul@nki.nl)

OF 11R-3
CT mammary and perforating arteries and veins: presentation radiologist
R. M. Mann; Nijmegen/NL
(r.mann@rad.umcn.nl)
Author Disclosures:
Ritse M. Mann: Advisory Board: screenpoint, bayer, bd, siemens; Board Member: Eusobi

Discussion

OF 11R-5
Breast MR: presentation radiographer
I. Kain; Vienna/AT
(irene.kain@akhwien.at)

OF 11R-6
Breast MR: presentation radiologist
P. Clauser; Vienna/AT
(clauser.p@hotmail.it)
Author Disclosures:
Paola Clauser: Speaker: Siemens Healthineers

Discussion

16:00-17:00 **Open Forum #2 (Young ECR)**

Open Forum Session

Organised by the ESR Education Committee and Undergraduate Subcommittee

OF 11Y

The beauty of radiology for undergraduates and young residents

OF 11Y-1
Chairperson's introduction
V. J. Goh; London/UK

OF 11Y-2
Key anatomy on chest and abdominal radiographs
J. Zhong; Leeds/UK

Learning Objectives:
1. To explain the basic anatomy of the chest as seen on conventional radiographs.
2. To explain the basic anatomy of the abdomen as seen on conventional radiographs.

OF 11Y-3
Classical signs in chest imaging
A. P. Parkar; Bergen/NO
(apparkar@gmail.com)

Learning Objectives:
1. To illustrate and explain classical signs related to normal variants.
2. To illustrate and explain classical signs related to lung, mediastinal, and pleural pathology.

OF 11Y-4
Classical signs in abdominal imaging
S. Gourtsoyianni; Athens/GR

Learning Objectives:
1. To illustrate and explain classical signs related to normal variants.
2. To illustrate and explain classical signs related to abdominal pathology.

OF 11Y-5
Classical signs in urological imaging
A. J. van der Molen; Leiden/NL
(molen@lumc.nl)

Learning Objectives:
1. To illustrate and explain classical signs related to normal variants.
2. To illustrate and explain classical signs related to urological pathology.

Open forum discussion: The art of classical signs. How can knowledge of classical signs improve practice?

16:00-17:00 **Open Forum #3 (ESR)**

Open Forum Session

Organised by the ESOR

OF 11a

Live and e-learning: filling the gap - tips and tricks of "hybrid learning"

OF 11a-1
Chairperson's introduction
M. M. Thurnher; Vienna/AT

OF 11a-2
Live and e-learning: filling the gap
M. M. Thurnher; Vienna/AT
(majda.thurnher@meduniwien.ac.at)

Learning Objectives:
1. To discuss the advantages and drawbacks of e-learning.
2. To describe how the online exams work.
3. To discuss how to overcome e-learning caused social isolation.
Author Disclosures:
Majda M. Thurnher: Board Member: Chair of the Management Board of the European Board of Neuroradiology (EBNR)

OF 11a-3
Tips and tricks of "hybrid learning"
L. G. Astrakas; Ioannina/GR
(astrakas@uoi.gr)

Learning Objectives:
1. To understand how hybrid learning differs from other forms of learning.
2. To learn how to set up a hybrid classroom.
3. To learn how to engage remote and on-site students.
4. To become familiar with hybrid tech tools.

Open forum discussion

16:00-17:00 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the ESR Communication and External Affairs Committee

OF 11b

CCEA: what we are doing for the radiology community?

Moderator
N. I. Traykova; Plovdiv/BG

Learning Objectives:
This session will present the main activities of the ESR Committee of Communication and External Affairs, such as the collaboration of ESR with the radiology community around the world in the field of artificial intelligence education and attraction of young people, the very active and important role of ESR-PAG, and all the activities related to the International Day of Radiology.

OF 11b-2
The education of young radiologist in Ukraine
T. Yalynska; Kiev/UA

OF 11b-3
The more visible radiologist
V. F. Muglia; Ribeirao Preto/BR

OF 11b-4
To be seen: the acknowledgement of the patient as a person
E. Steinthaler; Vienna/AT
(post@evelynsteinthaler.com)

OF 11b-5
CCEA: from the past to the future
M. Bertolotto; Trieste/IT
(michele.bertolotto@gmail.com)

Discussion

16:00-17:00 **Room B**

Refresher Course: Cardiac

RC 1103

Pros and Cons: Evaluating patients with stable cardiac chest pain: non-invasive anatomical coronary artery imaging should be the first-line investigation for all patients

RC 1103-1
Chairperson's introduction
R. Vliegenthart; Groningen/NL
Author Disclosures:
Rozemarijn Vliegenthart: Research Grant/Support: Institutional research grant, Siemens Healthineers; Speaker: Siemens Healthineers, Bayer

RC 1103-2
PRO
M. Gutberlet; Leipzig/DE
(matthias.gutberlet@helios-kliniken.de)

Learning Objectives:
This house believes that, when evaluating patients with stable cardiac chest pain, non-invasive anatomical coronary artery imaging should be the first-line investigation for all patients.
Author Disclosures:
Matthias Gutberlet: Advisory Board: Bayer; Board Member: ESCR

RC 1103-3
CON
R. Manka; Zurich/CH

Learning Objectives:
This house believes that, when evaluating patients with stable cardiac chest pain, non-invasive anatomical coronary artery imaging should NOT be the first-line investigation for all patients.

Panel Discussion: Is a single test sufficient in all patients? Are imaging departments ready and prepared to provide these diagnostic services?

16:00-17:00 **Room D**

Transatlantic Course of ESR and RSNA (Radiological Society of North America): Breast Cancer Imaging

TC 11

Treatment and follow up

Moderators
F. J. Gilbert; Cambridge/UK
E. Conant; Philadelphia, PA/US

TC 11-3
A. Neoadjuvant breast imaging to stage and assess response
L. Moy; New York, NY/US
(Linda.moy@nyulangone.org)

Learning Objectives:
1. To discuss the rationale for neoadjuvant chemotherapy.
2. To review the role of imaging for the initial evaluation of initial staging and monitoring the response to treatment.
3. To explain why breast MRI is the imaging study of choice for evaluating the response to neoadjuvant chemotherapy in locally advanced breast cancer.
4. To review the role of MRI as a biomarker of treatment response.
Author Disclosures:
Linda Moy: Advisory Board: iCAD, Lunit , Guerbet; Board Member: ISMRM, SBI

TC 11-4
B. Post-therapy imaging
J. Camps Herrero; Valencia/ES
(jcamps@riberasalud.es)

Learning Objectives:
1. To describe the role of the different morphological and functional imaging techniques in the evaluation of the treated breast.
2. To recognise the different imaging findings in the treated breast and their respective biological correlates, as well as the normal timing of their appearance.
3. To learn the different imaging appearances of relapse and how to manage them.
Author Disclosures:
Julia Camps Herrero: Advisory Board: Bayer, Becton Dickinson

TC 11-5
C. Interactive case discussion
L. Moy; New York, NY/US
(Linda.moy@nyulangone.org)
J. Camps Herrero; Valencia/ES
(jcamps@riberasalud.es)

Learning Objectives:
1. To describe the role of imaging in assessing response to neoadjuvant chemotherapy and in post-treatment evaluation.
2. To recognise the appearance of complete, partial, and noncomplete responses to neoadjuvant therapy at breast MRI and the appearance of relapse in surveillance patients.
3. To compare the strengths and weaknesses of standard imaging modalities for assessing response to neoadjuvant chemotherapy and for assessing post-treatment changes.
4. To understand the clinical over- and underestimation of residual breast cancer at MRI.
Author Disclosures:
Linda Moy: Advisory Board: iCAD, Lunit , Guerbet; Board Member: ISMRM, SBI
Julia Camps Herrero: Advisory Board: Bayer, Becton Dickinson

16:00-17:00 **Room G**

Refresher Course: Neuro

RC 1111

Pros and Cons: MR spectroscopy never made it into clinical neuroradiology

RC 1111-1
Chairperson's introduction
L. van den Hauwe; Antwerp/BE

RC 1111-2
PRO
Z. Rumboldt; Rovinj-Rovigno/HR
(puz3@yahoo.com)

Learning Objectives:
This house believes that MR spectroscopy NEVER made it into clinical neuroradiology.

RC 1111-3
CON
D. P. Auer; Nottingham/UK
(Dorothee.Auer@nottingham.ac.uk)

Learning Objectives:
This house believes that MR spectroscopy DID make it into clinical neuroradiology.

Panel discussion: MR spectroscopy: dead or alive in clinical neuroradiology?

16:00-17:00 **Tech Gate Auditorium**

Patients in Focus

IF 11

The official opening of Patients in Focus

Moderators
E. Briers; Hasselt/BE
R. G. H. Beets-Tan; Amsterdam/NL

IF 11-2
Introduction to Patients in Focus
R. G. H. Beets-Tan; Amsterdam/NL

Learning Objectives:
1. To learn about the changing role of the radiologist, moving closer to the clinicians and patients.
2. To appreciate the new positioning of the radiologist in the medical world.
3. To highlight the unique position of the radiologist/radiology department in the patient's journey through their disease.
4. To appreciate the complex personal ecosystem of a patient surrounded by others and their care team.

IF 11-3
My life as caretaker and becoming a patient and care-needer
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To appreciate the complex situation of a caretaker taking care of a person with mental health issues.
2. To understand the need for special attention both for the patient "at hand" and the patient being taken care of.
3. To consider the difficult equilibrium and shifting ground of the patient and the person taking care of them during the patient journey.

IF 11-4
Psychological and emotional roller coasters both for the patient and caretaker in serious life-threatening diseases
K. Gruber; Vienna/AT
(gruber@krebshilfe-wien.at)

Learning Objectives:
1. To appreciate the special impact of "life-threatening diseases" on the mental state of a patient.
2. To understand that everyone contributing to the patient journey through their disease has a role to play in keeping the patient in a "good" condition.
3. To consider the position of accompanying persons and caretakers.

IF 11-5
Introduction to the Patient in Focus posters
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

IF 11-6
Panel discussion: Is the patient in focus? Should we consider liaison with other medical care professionals to support patients and caretakers/caregivers?
C. Justich; Vienna/AT
(cjustich@me.com)

16:00-17:30 **Room C**

E^3 - Advanced Courses: Liver, Bile Ducts and Pancreas Imaging

E^3 1120a

Hepatocellular carcinoma: a multidisciplinary approach in real life

E^3 1120a-1
Chairperson's introduction
V. Vilgrain; Clichy/FR

Learning Objectives:
1. To review the diagnostic imaging findings of hepatocellular carcinoma.
2. To review the management of patients with suspected or confirmed hepatocellular carcinoma.
3. To integrate the pros and cons of different management approaches for hepatocellular carcinoma.

E^3 1120a-2
Diagnosis and follow-up of hepatocellular carcinoma
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

Learning Objectives:
1. To learn about the common features of typical hepatocellular carcinoma (HCC) as detailed in the guidelines.
2. To discuss the pros and cons of EASL and LIRADS.
3. To become familiar with the differences according to MRI contrast agents for the diagnosis of hepatocellular carcinoma.
4. To learn about patient management of atypical lesions in chronic liver diseases.

E^3 1120a-3
Treatment algorithms in hepatocellular carcinoma: the hepatologist's view
P. Galle; Mainz/DE

Learning Objectives:
1. To link staging in hepatocellular carcinoma (HCC) to treatment.
2. To obtain an overview on new systemic treatment options.
3. To discuss the role of systemic therapy in early and intermediate staged HCC.
Author Disclosures:
Peter Galle: Advisory Board: Bayer BMS MSD AstraZeneca SIRTEX Merck Lilly Blueprint Adaptimmune Eisai Roche Ipsen Gilead; Research Grant/Support: Roche, Bayer

E^3 1120a-4
Radiological treatment of hepatocellular carcinoma
L. Crocetti; Pisa/IT
(laura.crocetti@med.unipi.it)

Learning Objectives:
1. To consider the interventional radiology treatments for hepatocellular carcinoma (HCC) in the current guidelines.
2. To analyse results of ablative treatments in early stages.
3. To examine the role of intra-arterial treatments in intermediate and advanced stages.
Author Disclosures:
Laura Crocetti: Speaker: Angiodynamics, Terumo, Boston, Astra Zeneca

E^3 1120a-5
Multidisciplinary tumour board: case-based panel discussion
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

16:00-17:30 **Room E2**

Clinical Trials in Radiology

CTiR 11
Clinical Trials in Radiology 2

CTiR 11-1
Chairpersons' introduction
M. Dewey; Berlin/DE
C. Catalano; Rome/IT
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

CTiR 11-2
RACOON: The German nationwide Radiological Cooperative Network for imaging research on COVID-19 and beyond
A. M. Bucher[1], C. K. Kuhl[2], H-P. Schlemmer[3], M. Makowski[4], H-U. Kauczor[3], G. Antoch[5], W. Heindel[6], K. Nikolaou[7], the RACOON Study Group[1], T. J. Vogl[1], B. Hamm[8], T. Penzkofer[8]; [1]Frankfurt/DE, [2]Aachen/DE, [3]Heidelberg/DE, [4]Munich/DE, [5]Düsseldorf/DE, [6]Münster/DE, [7]Tübingen/DE, [8]Berlin/DE
(andreas.bucher@kgu.de)

Purpose: To promote collaboration during the COVID-19 pandemic we built RACOON, a nationwide infrastructure project enabling image-based research with a focus on AI training and biomarker development.
Methods or Background: To improve preparedness for current and future pandemics, the Federal Ministry of Education and Research proposed to build networks among university hospitals to improve nationwide academic collaboration to respond to national challenges. The radiological network RACOON was designed to unite all German academic radiology departments to a national imaging platform.
Results or Findings: As the only one among the sponsored network projects, RACOON managed to include all 36 academic radiology departments in Germany. Within one year, we (i)set up regulatory foundations, (ii)adapted pre-existing toolsets to a comprehensive image-analysis framework, (iii)installed 34 distributed hardware nodes at radiology departments of university hospitals, (iv)set up a cloud-based central environment, (v)developed a structured reporting standard applicable to a range of pulmonary pathologies, and (vi)gathered a large-structured dataset. The RACOON dataset currently consists of (a)14,000 structured reports of chest CTs (6.6 million reporting items), (b)a subset of 2800 manually segmented chest CTs, (c)a complementary clinical dataset for all cases, containing outcome data and (d)2000 structured reports of chest radiographs. Within the consortium, there are currently 30 individual research topics ranging from screening to prognostic models that will be collaboratively executed in RACOON.
Conclusion: The challenge of the global pandemic has sparked commitment to establish large collaborative efforts in radiological research on a previously unparalleled scale. From this initiative we were able to bring into being a unique collaborative infrastructure to reduce the organisational overhead for multicentric imaging research with a focus on federated AI training.
Limitations: Analyses are ongoing.
Ethics committee approval: IRB approval for this multicentre study was obtained.
Funding for this study: RACOON is funded by the NUM (BMBF-grant-number: 01KX2021)
Author Disclosures:
Konstantin Nikolaou: Nothing to disclose
Bernd Hamm: Nothing to disclose
Tobias Penzkofer: Nothing to disclose
Hans-Ulrich Kauczor: Nothing to disclose
the RACOON Study Group: Nothing to disclose
Christiane K. Kuhl: Nothing to disclose
Thomas J. Vogl: Nothing to disclose
Marcus Makowski: Nothing to disclose
Walter Heindel: Nothing to disclose
Heinz-Peter Schlemmer: Nothing to disclose
Gerald Antoch: Nothing to disclose
Andreas Michael Bucher: Other: Mint Medical GmbH is a project partner in RACOON.

CTiR 11-3
Discussant of: RACOON: The German nationwide Radiological Cooperative Network for imaging research on COVID-19 and beyond
E. Neri; Pisa/IT

CTiR 11-4
Opportunistic prediction of mortality risk: the role of the chest computed tomography scan in a cohort of COVID-19 patients
C. Gnasso[1], A. Palmisano[1], F. Darvizeh[1], D. Vignale[1], V. Nicoletti[1], F. De Cobelli[1], F. Giannini[2], A. Esposito[1]; [1]Milan/IT, [2]Cotignola/IT

Purpose: This is a multicentre (15 hospitals), retrospective, cohort study aimed to evaluate the role of CT biomarkers in the opportunistic prediction of mortality in Covid-19 patients.
Methods or Background: Non-contrast chest CTs were collected from February to April 2020. Participants were SARS-CoV2 positive hospitalized patients who underwent chest CT in the first 72 hours from admission. The outcome was the evaluation of mortality risk based on CT-scans derived parameters. The collected variables were: coronary artery calcium score (CACS), the density of paravertebral muscles, vertebral body and hepatic parenchyma as surrogate CT marker of sarcopenia, osteoporosis and liver steatosis, and semi-quantitative measurement of pulmonary involvement (0%,<25%,25-50%,50-75%,>75%). Descriptive statistics were performed in the overall population. Baseline variables were tested for univariate significance; those significantly associated with the primary outcome ($p<0.05$) entered multivariable binary logistic regression, calculating adjusted ORs and their 95% CIs. Multicollinearity was examined using the variance inflation factor. The performance of the models in predicting mortality was assessed by ROC curves and the AUCs were compared with the DeLong method.
Results or Findings: We enrolled 1668 COVID-19 patients (mean age 67±13 years); 424 (25%) died. The independent predictors of mortality were: liver steatosis (OR 1.4, CI 95% 1.09-1.88, $p<0.01$), sarcopenia (OR 1.4, CI 95% 1.07-1.81, $p<0.02$), pulmonary involvement (OR 3.4, CI 95% 2.63-4.41, $p<0.0001$), age (OR 1.1, CI 95% 1.07-1.10, $p<0.0001$) and male sex (2.0, CI 95% 1.53-269, $p<0.0001$). The prediction model including all these variables showed an AUC significantly higher than the AUC provided by the model, including only pulmonary involvement as CT parameter (AUC 0.79 vs. AUC 0.63; $p<0.001$).
Conclusion: Opportunistic CT parameters indicative of cardiovascular and metabolic risk may improve the mortality prediction at admission in COVID-19 patients.
Limitations: The study is limited by its retrospective nature.
Ethics committee approval: Not applicable
Funding for this study: Not applicable
Author Disclosures:
Francesco Giannini: Nothing to disclose
Valeria Nicoletti: Nothing to disclose
Davide Vignale: Nothing to disclose
Antonio Esposito: Nothing to disclose
Anna Palmisano: Nothing to disclose
Francesco De Cobelli: Nothing to disclose
Chiara Gnasso: Nothing to disclose
Fatemeh Darvizeh: Nothing to disclose

CTiR 11-5
Discussant of: Opportunistic prediction of mortality risk: the role of the chest computed tomography scan in a cohort of COVID-19 patients
R. Alonso González; Madrid/ES

CTiR 11-6
Large vessel occlusion of the anterior circulation and low NIHSS, what should we do? A multicentre propensity score matching analysis
A. Camilli, A. M. Alexandre, L. Scarcia, F. D'Argento, I. Valente, G. Garignano, A. Pedicelli; Rome/IT
(aricamilli@gmail.com)

Purpose: The benefit of mechanical thrombectomy (MT) in patients with acute ischaemic stroke (AIS) due to large vessel occlusion (LVO) and baseline mild neurological symptoms (NIHSS score ≤ 5) remains unclear. The purpose of this study was to evaluate the effectiveness of MT in this subgroup of patients.
Methods or Background: The databases of 9 high-volume Italian stroke centres were retrospectively screened for patients with LVO in the anterior circulation and a baseline NIHSS score ≤ 5 that received either immediate MT or best medical management (BMM) with the possibility of rescue MT upon neurological worsening. The primary outcome measure was an mRS score 0-1 at 90 days. Propensity score matching (PSM) analysis was used to estimate the treatment effect of immediate MT compared to BMM/rescue MT.
Results or Findings: Two hundred and seventy-two patients received immediate MT (MT group). The BMM/rescue MT group included 41 patients. The primary outcome was achieved in 78.6 % (n=246) of the overall patients, with a higher proportion in the MT group (80.5% vs 65.9%, $p=0.03$) in an unadjusted analysis. After PSM, patients in the MT group had a 19.5% higher chance of excellent outcome at 90 days compared to the BMM/rescue MT group with a similar risk of death from any cause.
Conclusion: Our experience is in favour of a potential benefit of MT also in patients with LVO and an NIHSS score ≤ 5 at the time of groin puncture.

Limitations: Nonetheless, this issue waits for a clear-cut recommendation in a dedicated clinical trial.
Ethics committee approval: Approval was received.
Funding for this study: Nothing to disclose.
Author Disclosures:
Iacopo Valente: Nothing to disclose
Andrea Maria Alexandre: Nothing to disclose
Arianna Camilli: Nothing to disclose
Luca Scarcia: Nothing to disclose
Giuseppe Garignano: Nothing to disclose
Francesco D'Argento: Nothing to disclose
Alessandro Pedicelli: Nothing to disclose

CTiR 11-7

Discussant of: Large vessel occlusion of the anterior circulation and low NIHSS, what should we do? A multicenter propensity score matching analysis
N. Pyatigorskaya; Paris/FR

CTiR 11-8

The effect of music on patients' anxiety in venous catheter placement procedures: a prospective randomised controlled trial
F. N. N. Fleckenstein, A. Frisch, F. Collettini, B. Hamm, W. Lüdemann, B. Gebauer, M. Jonczyk; Berlin/DE
(florian.fleckenstein@charite.de)

Purpose: The aim of the study was to assess the influence of music on anxiety levels compared to standard patient care in patients undergoing venous catheter placement procedures.
Methods or Background: The prospective randomised controlled trial included patients undergoing placement procedures for peripherally inserted central venous catheters (PICC), ports and central venous catheters (CVC). The patients were randomly assigned to a music intervention group (MIG) and a control group (CTRL). State and trait anxiety levels were assessed as primary outcome using the state-trait anxiety inventory (STAI) before and after the procedures. Secondary outcomes comprised averaged heart rate for all participants and time of radiological surveillance for port placement procedures exclusively.
Results or Findings: 72 participants were included into the final analysis (MIG n=40; CTRL n=32). All procedures were successful, and no major complications were reported. Mean levels for post-interventional anxieties were significantly lower in the MIG compared to the CTRL (34.9±8.9 vs. 44±12.1; p<0.001). Mean heart rate in the MIG was significantly lower than in the CTRL (76.1±13.7 vs. 93±8,9; p<0.001). Procedure time for port implantation was significantly longer in the MIG by 3min 45s (p=0.031).
Conclusion: Music exposure during central venous catheter placement procedures significantly reduces anxiety and stress levels and can be used to improve patients' overall experience in the angio suite.
Limitations: The study was performed at a single, yet maximum-care centre. Secondly, due to the per-protocol approach of this study only a part of all patients was enrolled into the final analysis. Lastly, as for the nature of music, blinding is impossible. This might have caused bias, especially the Hawthorne effect.
Ethics committee approval: The study was approved by the ethics committee of the Charité. The trial was further registered with the German Clinical Trials Register.
Funding for this study: No funding.
Author Disclosures:
Bernd Hamm: Nothing to disclose
Martin Jonczyk: Nothing to disclose
Bernhard Gebauer: Nothing to disclose
Anne Frisch: Nothing to disclose
Federico Collettini: Nothing to disclose
Willie Lüdemann: Nothing to disclose
Florian Nima Nima Fleckenstein: Nothing to disclose

CTiR 11-9

Discussant of: The effect of music on patients' anxiety in venous catheter placements procedures: a prospective randomised controlled trial
P. Marra; Bergamo/IT

CTiR 11-10

Multireader comparison and validation of previously published MRI tumour response evaluation methods in rectal cancer
N. El Khabadi[1], M. Lahaye[1], M. Maas[1], S. Nougaret[2], L. Curvo-Semedo[3], R. Tissier[1], R. G. H. Beets-Tan[1], D. M. J. Lambregts[1]; [1]Amsterdam/NL, [2]Montpellier/FR, [3]Coimbra/PT

Purpose: To compare four previously published methods for rectal tumour response evaluation after chemoradiotherapy (CRT) in a multicentre study setting among a large group of readers with different experience levels.
Methods or Background: 22 international radiologists (5 rectal MR-experts, 17 general/abdominal radiologists) retrospectively reviewed the post-CRT MRIs of n=90 patients (from 10 centres), using four previously published response methods. Two were based on T2W-MRI only: (1) mr tumour regression grade (mrTRG), and (2) split-scar sign (Santiago et al. 2020). Two were based on combined assessment of T2W-MRI + DWI: (3) modified-mrTRG, and (4) DWI-pattern approach (Lambregts et al. 2018). Mixed model linear regression was used to calculate average sensitivity/specificity/accuracy to predict a complete response (vs residual tumour) post-CRT and to assess the impact of reader experience level. Interobserver agreement (IOA) was calculated using Kendall's coefficient (W). Readers were asked to indicate their preferred scoring method(s).
Results or Findings: Average sensitivity/specificity/accuracy to predict a complete response were 52%/82%/73% (mrTRG), 25%/94%/74% (split-scar), 28%/95%/75% (modified-mrTRG), and 30%/96%/77% (DWI-patterns). Performance was significantly positively affected by higher reader experience level. Effect size was significantly negative (lower accuracy and specificity) for mrTRG compared to the other methods, though with a positive effect size for sensitivity. IOA was W0.48(mrTRG), W0.25 (split scar), W0.46(modified-mrTRG), W0.51(DWI-patterns). DWI-patterns was chosen as the preferred scoring method by 73% (vs. 36% modified-mrTRG, 18% mrTRG, 5% split scar).
Conclusion: In conclusion, compared to the other methods, mrTRG showed significantly lower accuracy and specificity (but higher sensitivity) to diagnose complete responders. Overall, the two DWI-based methods achieved the best results based on a combination of IOA, reader preference and highest specificity to detect patients with residual tumour. Higher reader experience level positively affected diagnostic performance.
Limitations: Restrospective study
Ethics committee approval: Yes
Funding for this study: No
Author Disclosures:
Max Lahaye: Nothing to disclose
Monique Maas: Nothing to disclose
Renaud Tissier: Nothing to disclose
Najim El Khababi: Nothing to disclose
Doenja Marina Johanna Lambregts: Nothing to disclose
Luis Curvo-Semedo: Nothing to disclose
Regina G. H. Beets-Tan: Nothing to disclose
Stephanie Nougaret: Nothing to disclose

CTiR 11-11

Discussant of: Multireader comparison and validation of previously published MRI tumour response evaluation methods in rectal cancer
A. Laghi; Rome/IT

CTiR 11-12

Learning the assessment of tumour response categories from structured radiology reports
M. A. Fink[1], K. Kades[1], A. H. H. Bischoff[1], M. Moll[1], C. P. Heussel[1], H-U. Kauczor[1], K. H. Maier-Hein[1], T. F. Weber[1], J. Kleesiek[2]; [1]Heidelberg/DE, [2]Essen/DE
(matthias.fink@med.uni-heidelberg.de)

Purpose: The purpose of the study is to use the data mining advantages of structured oncology reports (SOR) to train a deep learning NLP model aiming at a fast classification of patients' tumour response category in free-text oncology reports (FTOR).
Methods or Background: This retrospective multicentre study includes 14,586 oncologic CT, MRI, and ultrasound reports consisting of two types of text corpora: SOR (n = 13,694) and FTOR (n = 895) comprising 14 tumour families acquired in clinical routine from 03/2018 to 08/2021. We trained Google's deep learning NLP algorithm BERT on automatically extracted and labelled SOR to predict tumour response categories of progressive disease (PD), stable disease (SD), partial response (PR), and complete response (CR) in FTOR based solely on the textual information given in the "Findings" section. BERT's classification performance was compared against a conventional NLP method (TF-IDF) and seven human annotators (two radiologists, two medical students, and three medical-technical radiology assistant [MTRA] students) with a different level of radiological expertise.
Results or Findings: The highly structured SOR allowed for an easy rule-based data extraction to define SOR ground truth labels for NLP model training. On the FTOR, BERT showed better classification results (F1 = 70.0) than the medical and MTRA students (F1 = 67.5) and the conventional NLP method TF-IDF (F1 = 60.9), but was inferior to both radiologists (F1 = 78.2) in predicting the tumour response category.
Conclusion: Data mining of SOR enabled an automated and accurate labelling approach to train a deep learning NLP model for ascertaining tumour response categories in free-text reports. However, overall moderate human and machine F1 scores highlight the difficulties in assessing the "Findings" section of radiological reports.
Limitations: Class imbalance per subset could bias the results.

Ethics committee approval: The study was approved by our IRB (S-083/2018).
Funding for this study: None
Author Disclosures:
Jens Kleesiek: Nothing to disclose
Claus Peter Heussel: Nothing to disclose
Matthias Alexander Fink: Nothing to disclose
Hans-Ulrich Kauczor: Nothing to disclose
Tim Frederik Weber: Nothing to disclose
Klaus H. Maier-Hein: Nothing to disclose
Martin Moll: Nothing to disclose
Arved H. H. Bischoff: Nothing to disclose
Klaus Kades: Nothing to disclose

CTiR 11-13
Discussant of: Learning the assessment of tumour response categories from structured radiology reports
A. Alberich-Bayarri; Valencia/ES

16:00-17:30 **Room F1**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1121
Sport injuries

E³ 1121-1
Upper limb
I. Boric; Zabok/HR

Learning Objectives:
1. To become familiar with the most common clinical features and mechanisms of injury to the upper limb in athletes.
2. To learn about the use of imaging to detect sport-related injuries to the upper limb.

E³ 1121-2
Lower limb
C. Martinoli; Genoa/IT
(55904@unige.it)

Learning Objectives:
1. To become familiar with the most common clinical features and mechanisms of injury to the lower limb in athletes.
2. To learn about the use of imaging to detect sport-related injuries to the lower limb.
Author Disclosures:
Carlo Martinoli: Equipment Support Recepient: Canon, Esaote; Speaker: Canon, Esaote, Novartis, Novo Nordisk, Pfizer, Philips, Sobi, Roche, and Takeda

16:00-17:30 **Room K**

E³ - Advanced Courses: Head and Neck Imaging

E³ 1122
Head and neck tumours in children: a multidisciplinary approach

E³ 1122-1
Chairperson's introduction
R. R. van Rijn; Amsterdam/NL

Learning Objectives:
1. To interpret diagnostic imaging findings in a child with a head and neck tumour.
2. To understand how information from imaging impacts treatment choice.
3. To suggest additional imaging (e.g., ultrasound-guided biopsy or PET/CT) in challenging clinical situations.

E³ 1122-2
Role of imaging in a child with a head and neck tumour
A. Bohté; Utrecht/NL

Learning Objectives:
1. To name the most frequently encountered head and neck tumours in children.
2. To apply a dedicated MRI protocol for suspected paediatric head and neck tumours.
3. To predict the likelihood of a malignant (or benign) entity in the head and neck region based on cross-sectional imaging features.

E³ 1122-3
Management of a child with a head and neck tumour: the oncologist's perspective
R. Knops; Utrecht/NL
(r.r.g.knops@prinsesmaximacentrum.nl)

Learning Objectives:
1. To summarise the background of the Amore approach in children with rhabdomyosarcoma.
2. To describe the indications and prognosis of chemotherapy in children.
3. To distinguish between chemotherapy and immunotherapy.

E³ 1122-4
Use of radiation therapy in a child with a head and neck tumour
G. O. R. Janssens; Utrecht/NL
(G.O.R.Janssens@umcutrecht.nl)

Learning Objectives:
1. To define the indications for radiotherapy in frequently encountered paediatric head and neck tumours.
2. To describe the possibilities of proton radiation therapy for head and neck tumours in children.

E³ 1122-5
Multidisciplinary tumour board: case-based panel discussion
R. R. van Rijn; Amsterdam/NL

16:00-17:30 **Room M 4**

Special Focus Session

SF 11
My three top tips for musculoskeletal imaging

SF 11-1
Chairperson's introduction
J. C. Vilanova; Girona/ES

SF 11-2
Chondroid tumours
R. Arkun; Izmir/TR
(rarkun@yahoo.com)

Learning Objectives:
1. To understand the WHO 2020 classification on chondroid tumours.
2. To review the diagnostic dilemma of enchondroma versus atypical chondroid tumours.
3. To learn if MR imaging features differentiate low-grade chondrosarcoma from high-grade chondrosarcoma in long bones.

SF 11-3
Osseous tumours
R. Lalam; Oswestry/UK
(radhesh.lalam@nhs.net)

Learning Objectives:
1. To understand the importance of radiographs in the diagnosis of bone tumours.
2. To learn the key considerations in arriving at a differential diagnosis.
3. To appreciate the important rules of biopsy and radiologic-pathologic correlation.

SF 11-4
Soft tissue tumours
K. Wörtler; Munich/DE

Learning Objectives:
1. To learn about the role of imaging in the diagnosis of soft tissue tumours.
2. To understand the importance of biopsy and radiologic-pathologic correlation.
3. To become familiar with the basic aspects of local staging.

Questions and discussion

SF 11-6
Rheumatoid arthritis
M. Reijnierse; Leiden/NL
(m.reijnierse@lumc.nl)

Learning Objectives:
1. To learn about a short MRI protocol for early rheumatoid arthritis.
2. To detect the early signs of rheumatoid arthritis on MRI.
3. To appreciate the clinical impact of early MRI.
Author Disclosures:
Monique Reijnierse: Research Grant/Support: International Skeletal Society

SF 11-7
Spondylarthritis (SpA)
E. Vassalou; Iraklion/GR
(vassalou.e@hotmail.com)

Learning Objectives:
1. To understand how to increase the specificity in diagnosing axial SpA.
2. To review which particular MR imaging characteristics of sacroiliac joints BME/osteitis point towards axial SpA.
3. To learn how to differentiate axial SpA from mimickers.

SF 11-8
CRMO/CNO/SAPHO
J. Teh; Oxford/UK
(jamesteh1@googlemail.com)

Learning Objectives:
1. To review the imaging features of CRMO/CNO.
2. To review the imaging features of SAPHO.
3. To learn about the imaging algorithm and the potential role of whole-body imaging in these diseases.

Questions and discussion

SF 11-10
Muscle oedema
V. Vasilevska-Nikodinovska; Skopje/MK
(v_vasilevska@yahoo.com)

Learning Objectives:
1. To present an overview of differential considerations in patients presenting with muscle oedema.
2. To become familiar with the causes of muscle oedema on the basis of mechanism (vasogenic, congestive, traumatic, and tumorigenic) and their specific imaging features.
3. To understand common mistakes and how to avoid them.

SF 11-11
Bone marrow oedema
I. Engele; Riga/LV
(engele.ilze@gmail.com)

Learning Objectives:
1. To provide an overview of the classification of bone marrow oedema.
2. To identify the difference between traumatic versus non-traumatic bone marrow oedema.
3. To understand that bone marrow oedema is unspecific but a sensitive sign of pathology.

Questions and discussion

16:00-17:30 **Room M 5**

E³ - Advanced Courses: Liver, Bile Ducts and Pancreas Imaging

E³ 1120b

Common and uncommon incidental liver lesions in non-cirrhotic patients: a multidisciplinary approach

E³ 1120b-1
Chairperson's introduction
Y. Menu; Paris/FR

Learning Objectives:
1. To recognise the key imaging features for diagnosing common and uncommon incidental liver lesions in the non-cirrhotic liver.
2. To distinguish focal nodular hyperplasia from hepatocellular adenomas and to identify the main subtypes of hepatocellular adenomas.
3. To identify potential risks of an inadequate management of incidental benign or malignant lesions in the non-cirrhotic patient.

E³ 1120b-2
The incidentally discovered solid lesion: how to diagnose
F. Vernuccio; Padova/IT
(federicavernuccio@gmail.com)
Author Disclosures:
Federica Vernuccio: Other: none related to this presentation (received support from Bracco and GE to attend meetings, lecture fee for Guerbet)

E³ 1120b-3
How to manage the incidentally discovered solid lesion: the radiologist's perspective
Y. Menu; Paris/FR
(yves.menu@aphp.fr)

E³ 1120b-4
How to manage the incidentally discovered solid lesion: the clinician's perspective
S. Olde Damink; Maastricht/NL
(steven.oldedamink@maastrichtuniversity.nl)

E³ 1120b-5
Multidisciplinary tumour board: case-based panel discussion
Y. Menu; Paris/FR
(yves.menu@aphp.fr)

16:00-17:30 **Room O**

Professional Challenges Session

PC 11

Optimising professional radiographers' training

PC 11-1
Chairpersons' introduction
R. Gerasia; Palermo/IT
B. M. Verbist; Leiden/NL

PC 11-2
"In house" subspecialty training: raising standards
F. Zarb; Msida/MT
(francis.zarb@um.edu.mt)

Learning Objectives:
1. To describe the meaning and requirement of a subspeciality.
2. To analyse an overview of subspeciality training to raise the standards.
3. To discuss the pros and cons of subspecialisation.

PC 11-3
Multidisciplinary training opportunities
S. J. Foley; Dublin/IE
(shane.foley@ucd.ie)
P. Gilligan; Dublin/IE
(paddygilligan@mater.ie)

Learning Objectives:
1. To identify cross-disciplinary training opportunities, both combined and complimentary.
2. To analyse how to communicate between all disciplines.
3. To learn about adapting multidisciplinary training in the clinic and university.
Author Disclosures:
Paddy Gilligan: Board Member: president of efomp board member euramed; Employee: MMUH ireland

PC 11-4
Clinical simulation to support learning
K. Van Belle; Brussel/BE
(kurt.vanbelle@odisee.be)

Learning Objectives:
1. To apply clinical reality into clinical simulations.
2. To describe how to use formative assessments to stimulate growth in clinical skills.
3. To examine how to invest and update clinical training facilities for simulation, taking the 'speed of innovation' into account.

PC 11-5
Supporting expanding roles
A. England; Cork/IE
(aengland@ucc.ie)

Learning Objectives:
1. To discuss the current drivers for supporting role expansion.
2. To define the necessary frameworks and governance structures for successful role expansion.
3. To estimate the advantages and disadvantages of role expansion in terms of improving diagnostic quality and treatment outcomes.
Author Disclosures:
Andrew England: Board Member: EFRS

Panel discussion: Does radiographers' advanced training improve high-quality diagnosis and patient outcomes?

16:00-17:30 **Room X**

E³ - European Diploma Prep Sessions

E³ 1123
Interventional

E³ 1123-1
Chairperson's introduction
I. Bargellini; Pisa/IT

Learning Objectives:
To understand the principles and techniques of angiography and image-guided interventions. To become familiar with the most common percutaneous and intra-arterial interventions in oncology. To describe the most common vascular interventions.

E³ 1123-2
Basic principles of angiography and image-guided interventions
R. Müller-Wille; Wels/AT

Learning Objectives:
1. To describe the normal anatomy and normal variants of the arterial and venous vascular system.
2. To understand the importance of pre-procedure planning and selection of image-guidance techniques.
3. To explain basic percutaneous image-guided techniques, including arterial access as well as biopsy and drainage.

E³ 1123-3
Image-guided interventions in oncology
L. Luerken; Regensburg/DE
(lukas.luerken@gmail.com)

Learning Objectives:
1. To describe the basic technical methodological principles and indications of imaging-guided interventions in oncological disorders, including thermal ablation techniques.
2. To understand the principles and indications for vascular interventions in cancer, such as the transarterial treatment of liver tumours.
3. To become familiar with post-treatment follow-up, highlighting normal and abnormal pathological imaging findings.

E³ 1123-4
Vascular interventions
D. Kuhelj; Ljubljana/SI

Learning Objectives:
1. To become familiar with the pretreatment imaging flow-chart in atherosclerotic diseases.
2. To describe the indications and techniques for arterial angioplasty and stenting.
3. To explain the techniques of arterial embolisation and coiling, as well as thromboaspiration.

Friday, July 15

08:00-09:00 **Open Forum #2 (Young ECR)**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESOR

BS 12
Radiologic anatomy: heart and great vessels

Moderator
C. Loewe; Vienna/AT

BS 12-2
Coronary anatomy: the usual and the suspect
M. Francone; Milan/IT
(marco.francone@hunimed.eu)

Learning Objectives:
1. To learn about the segmental approach to normal anatomy of coronary arteries and veins.
2. To understand the difference between anatomical variant and anomaly.
3. To become familiar with the most common coronary variations, anomalies, and their clinical relevance.

BS 12-3
Aorta and great arteries: where they are coming from and what can happen
K.-F. Kreitner; Mainz/DE
(Karl-Friedrich.Kreitner@unimedizin-mainz.de)

Learning Objectives:
1. To understand the embryology of the aorta and the great arteries.
2. To learn about the most common congenital disorders.
3. To become familiar with the normal appearance, dimensions, and most common pathologies of the thoracic aorta and great arteries.

BS 12-4
Myocardium and cardiac valves
R. Salgado; Antwerp/BE
(rodrigo.salgado@uza.be)

Learning Objectives:
1. To understand the anatomy of the cardiac valves.
2. To learn about the most common anomalies and diseases of cardiac valves.
3. To become familiar with a segmental approach to myocardial diseases.

Questions and answers

08:00-09:00 **Open Forum #3 (ESR)**

Open Forum Session

Organised by the ESR Subspecialties and Allied Sciences Committee

OF 12a
Opening the field of radiology

OF 12a-1
Chairperson's introduction: The role of the ESR Subspecialties and Allied Sciences Committee
A. H. Karantanas; Iraklion/GR
(akarantanas@gmail.com)

Learning Objectives:
The presentations aim at showing the current discussions and trends towards shaping the future role of radiology.

OF 12a-2
Visibility of the radiologist: why are soft skills so important?
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

OF 12a-3
Forensic imaging: time to move forward
G. Ampanozi; Zurich/CH
(garyfalia.ampanozi@irm.uzh.ch)

OF 12a-4
AI in medical physics: facts and trends
H. Zaidi; Geneva/CH
(habib.zaidi@hcuge.ch)

Discussion

08:00-09:00 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the EIBALL (European Imaging Biomarker Alliance)

OF 12b
Imaging biomarkers: should we pay attention?

Moderator
A. van der Lugt; Rotterdam/NL

Learning Objectives:
1. To understand the concept of imaging biomarkers.
2. To learn about the difficulties with measurements.
3. To appreciate the activities of EIBALL.

OF 12b-2
There is a need to measure in radiological practice: disease is present or absent: pro
M. M. França; Porto/PT
(mariamanuela.franca@gmail.com)
Author Disclosures:
Maria Manuela França: Advisory Board: QUIBIM

OF 12b-3
There is a need to measure in radiological practice: disease is present or absent: con
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, AuntMinnie

Live Q&A

OF 12b-5
What is the problem with measurements? We know what we are doing: pro
X. Golay; London/UK
Author Disclosures:
Xavier Golay: Board Member: Gold Standard Phantoms; CEO: Gold Standard Phantoms; Founder: Gold Standard Phantoms; Patent Holder: Gold Standard Phantoms; Share Holder: Gold Standard Phantoms

OF 12b-6
What is the problem with measurements? We know what we are doing: con
M. M. França; Porto/PT
(mariamanuela.franca@gmail.com)
Author Disclosures:
Maria Manuela França: Advisory Board: QUBIM

Live Q&A

OF 12b-8
Validation of biomarkers is cumbersome, boring, and not needed: pro
X. Golay; London/UK
Author Disclosures:
Xavier Golay: Board Member: Gold Standard Phantoms; CEO: Gold Standard Phantoms; Founder: Gold Standard Phantoms; Patent Holder: Gold Standard Phantoms; Share Holder: Gold Standard Phantoms

OF 12b-9
Validation of biomarkers is cumbersome, boring, and not needed: con
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, AuntMinnie

Live Q&A

08:00-09:00 **Room B**

Refresher Course: Physics in Medical Imaging

RC 1213

Advancing image-guided interventions with artificial intelligence (AI) and modelling

RC 1213-1
Chairpersons' introduction
A. Trianni; Trento/IT
O. Rampado; Turin/IT

RC 1213-2
AI and biomechanical modelling for advances in image-guided focal liver ablation
K. Brock; Houston, TX/US
(kkbrock@mdanderson.org)

Learning Objectives:
1. To understand the role of AI in enabling advanced image-guided focal ablation.
2. To demonstrate the improvement in targeting with biomechanical modelling for liver ablation.
3. To illustrate the correlation of the minimum ablation margin with recurrence rates and the importance of prospective, multi-centre clinical trials.

RC 1213-3
Clinical advances in stereotactic radiofrequency ablation of liver tumours
R. Bale; Innsbruck/AT
(reto.bale@i-med.ac.at)

Learning Objectives:
1. To learn about the rationale for the application of stereotaxy and image fusion for percutaneous ablation.
2. To learn about the essential parts of the workflow of stereotactic thermal ablation.
3. To learn about the short- and long-term outcomes after stereotactic thermal ablation of various primary and secondary liver tumours.

RC 1213-4
US-PET/CT fusion for image fusion for guidance of thermal ablation
L. A. Solbiati; Rozzano/IT
(luigi.solbiati@hunimed.eu)

Learning Objectives:
1. To learn the rationale for the fusion of US and PET/CT for the guidance of thermal ablation.
2. To understand the rationale for using, in selected cases, PET/contrast-enhanced CT (CECT) instead of simply PET/CT for image fusion with US.
3. To learn about the technical problems of US-PET/(CE)CT image fusion and its advantages over US-CT or US-MRI image fusion for the guidance of thermal ablation.

Panel discussion: What is now possible with interventional radiology?

08:00-09:00 **Room C**

Refresher Course: Imaging Informatics / Artificial Intelligence and Machine Learning

RC 1205

Artificial intelligence (AI) trustworthiness: from black boxes to glass boxes

RC 1205-1
Chairperson's introduction
N. Pyatigorskaya; Paris/FR

RC 1205-2
Generative adversarial networks (GAN) in medical imaging
A. Jiménez-Pastor; Valencia/ES
(anajimenez@quibim.com)

Learning Objectives:
1. To understand the basics of GAN and how they have been applied to radiology.
2. To discover how GAN can be used in data augmentation for training radiology AI models.
3. To learn about potential clinical applications of GAN in clinical routine workflows.
Author Disclosures:
Ana Jiménez-Pastor: Employee: Quibim SL

RC 1205-3
Minimum information about clinical artificial intelligence modelling: how to improve transparent reporting of AI algorithms
L. Topff; Amsterdam/NL
(laurens@topff.be)

Learning Objectives:
1. To understand the importance of high-quality annotation when developing AI models.
2. To assimilate how AI algorithms should report results and the associated confidence.
3. To discover the main limitations of narrow AI and the challenges towards general AI.

RC 1205-4
Trustworthy models when data is scarce: a case for self supervised learning
S. Trebeschi; Amsterdam/NL
(s.trebeschi@nki.nl)

Learning Objectives:
1. To understand new avenues of AI development.
2. To build robust, trustworthy models when little data is available.
3. To build high quality, trustable representations of your data.

RC 1205-5
Interpretability and explainability explained
B. H. M. van der Velden; Utrecht/NL
(B.H.M.vanderVelden-2@umcutrecht.nl)

Learning Objectives:
1. To understand how to improve trustworthiness in AI models through interpretability and explainability.
2. To learn about the challenges of current AI models with regards to interpretability and explainability.
3. To discover the existing techniques to make AI more interpretable and understandable.

Panel discussion: AI trustworthiness: from black boxes to glass boxes

08:00-09:00 **Room D**

Refresher Course: Neuro

RC 1211

Advanced MRI techniques in clinical neuroradiology

RC 1211-1
Chairperson's introduction
S. Haller; Geneva/CH
(sven.haller@gmail.com)
Author Disclosures:
Sven Haller: Advisory Board: EPAD imaging

RC 1211-2
Susceptibility weighted imaging (SWI)
S. Haller; Geneva/CH
(sven.haller@gmail.com)

Learning Objectives:
1. To understand the basic technical principles of SWI and similar techniques.
2. To understand how imaging parameters influence the interpretation of cases.
3. To discuss the key findings of SWI and similar techniques in common neurological diseases.
Author Disclosures:
Sven Haller: Advisory Board: EPAD imaging

RC 1211-3
Arterial spin labelling (ASL) perfusion
V. C. Keil; Amsterdam/NL
(v.c.w.keil@amsterdamumc.nl)

Learning Objectives:
1. To understand the technical principles behind ASL.
2. To learn when and how to use ASL.
3. To interpret ASL-derived cerebral blood flow maps compared to other perfusion techniques.
Author Disclosures:
Vera C. Keil: Author: The presentation contains references to own publications; Grant recepient: The presentation contains a reference to COST Action Glimr 2.0

RC 1211-4
Zero echo time (TE) imaging
E. Ljungberg; London/UK
(emil.ljungberg@kcl.ac.uk)

Learning Objectives:
1. To name three unique advantages of zero TE MRI.
2. To describe how to produce useful image contrast for neuroimaging with zero TE.
3. To identify imaging protocols where zero TE imaging can add value.
4. To explain the advantages and limitations of zero TE for neuroimaging.

Panel discussion: Which advanced techniques have found a place in clinical routine

08:00-09:00 **Room E2**

Refresher Course: GI Tract

RC 1201

Oesophageal and gastric junctional cancer

RC 1201-1
Chairperson's introduction
J. Brito; Faro/PT

RC 1201-2
The role of PET/CT in oesophageal and gastric junctional cancer
A. Ba-Ssalamah; Vienna/AT
(ahmed.ba-ssalamah@meduniwien.ac.at)

Learning Objectives:
1. To understand the role of PET/CT in the diagnostic workup of oesophageal and gastric junctional cancer.
2. To recognise important clinically relevant CT features in oesophageal and gastric junctional cancer.
3. To discuss the strengths and limitations of PET/CT for advanced colorectal cancer patients.
Author Disclosures:
Ahmed Ba-Ssalamah: Speaker: Bayer and Sanofi

RC 1201-3
The role of CT in oesophageal and gastric junctional cancer
K. Foley; Llantrisant/UK

Learning Objectives:
1. To understand the role of CT in the diagnostic workup of oesophageal and gastric junctional cancer.
2. To recognise important clinical relevant CT features in oesophageal and gastric junctional cancer.
3. To discuss the strengths and limitations of CT in oesophageal and gastric junctional cancer.
Author Disclosures:
Kieran Foley: Research Grant/Support: Health and Care Research Wales (HCRW), Moondance Foundation (Velindre Cancer Centre), Cancer Research Wales, Royal College of Radiologists (RCR)

RC 1201-4
The role of MRI in oesophageal and gastric junctional cancer
A. M. Riddell; London/UK

Learning Objectives:
1. To understand the role of MRI in the diagnostic workup of oesophageal and gastric junctional cancer.
2. To recognise important clinically relevant MRI features in oesophageal and gastric junctional cancer.
3. To discuss the strengths and limitations of MRI in oesophageal and gastric junctional cancer.

Panel discussion: What is the best diagnostic workup for oesophageal and gastric junctional cancer?

08:00-09:00 **Room F1**

Refresher Course: Breast

RC 1202

Minimally invasive treatment for breast lesions

RC 1202-1
Chairperson's introduction
P. Clauser; Vienna/AT
(clauser.p@hotmail.it)
Author Disclosures:
Paola Clauser: Speaker: Siemens Healtineers

RC 1202-2
Benign lesions: is there a role?
M. Torres-Tabanera; Madrid/ES
(mtorrestabanera@gmail.com)

Learning Objectives:
1. To revise the indications for the percutaneous treatment of benign breast lesions.
2. To analyse the technical aspects required to perform the procedure in an effective and safe way.
3. To discuss the limitations and potential complications.

RC 1202-3
B3 lesions: can we avoid surgery?
J. Camps Herrero; Valencia/ES
(jcamps@riberasalud.es)

Learning Objectives:
1. To review the current indications for vacuum-assisted biopsy in lesions with a high underestimation potential.

2. To discuss the possible role of MRI as an adjunct imaging technique in order to ensure successful percutaneous excision.
3. To review the results of the management of B3 lesions with vacuum-assisted biopsy.
Author Disclosures:
Julia Camps Herrero: Advisory Board: Bayer, Becton Dickinson

RC 1202-4
Is surgery always the answer to managing breast cancers?
N. Sharma; Leeds/UK
(nisha.sharma2@nhs.net)

Learning Objectives:
1. To review the current technologies available for the treatment of breast cancers.
2. To provide an overview of imaging trials currently in progress.
3. To understand the benefits and limitations of imaging versus conventional surgery in treating breast cancers.

Panel discussion: Image-guided treatments: the time is now

08:00-09:00 **Room K**

Refresher Course: Radiographers

RC 1214
Pros and Cons: Patient shielding is no longer needed

RC 1214-1
Chairpersons' introduction
G. Paulo; Coimbra/PT
(graciano@estescoimbra.pt)
C. Granata; Genoa/IT

RC 1214-2
PRO
P. Cosson; Teeside/UK
(p.cosson@tees.ac.uk)

Learning Objectives:
This house believes that patient shielding is no longer needed.

RC 1214-3
CON
M. F. McEntee; Cork/IE
(mark.mcentee@ucc.ie)

Learning Objectives:
This house believes that patient shielding is STILL needed.

RC 1214-4
Panel discussion: Patient shielding: should it stay or should it go and how to establish best clinical practice?
C. Granata; Genoa/IT
P. Gilligan; Dublin/IE
Author Disclosures:
Paddy Gilligan: Board Member: president of efomp board member euramed

08:00-09:00 **Room M 3**

Clinical Trials in Radiology

CTiR 12
Clinical Trials in Radiology 3

CTiR 12-1
Chairpersons' introduction
M. Dewey; Berlin/DE
C. Catalano; Rome/IT
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

CTiR 12-2
Updated DISCHARGE trial pretest probability calculator in stable chest pain: Collaborative Meta-Analysis of Cardiac CT (COME-CCT)
V. Wieske[*1], M. Walther[2], B. Weickert[1], S. Andrzejewski[1], B. Dubourg[3], D. Andreini[4], G. Pontone[4], P. Schlattmann[2], M. Dewey[1]; [1]Berlin/DE, [2]Jena/DE, [3]Rouen/FR, [4]Milan/IT
(viktoria.wieske@charite.de)

Purpose: To evaluate the accuracy of clinical pretest probability calculation alone and in combination with computed tomography angiography (CTA) results for the diagnosis of obstructive coronary artery disease (CAD).
Methods or Background: 5332 patients clinically referred to ICA, stable chest pain and suspected CAD were included in this international collaborative meta-analysis. The clinical probability models based on age, sex, and chest pain type were compared using the area under the receiver-operating-characteristic curve (AUC) with multivariable logistic regression.
Results or Findings: Clinical probability models based on age, sex, and chest pain type have limited discriminative ability, with AUC ranging from 0.66 to 0.69. The updated DISCHARGE pretest probability calculator was more accurate than the initial Diamond-Forrester model (AUC: 0.68, 95%-confidence interval 0.66 to 0.69 vs 0.63, 0.62 to 0.65). The combination of clinical pretest probability calculation with CTA findings significantly improved the accuracy compared with CTA alone (AUC: 0.86, 95%-confidence interval 0.85 to 0.87 vs 0.81, 0.80 to 0.82).
Conclusion: The combination of clinical probability and CTA improves the prediction of CAD compared to CTA alone and results in a good discriminative ability independent from the chest pain type.
Limitations: As commonly observed in individual participant data meta-analyses, individual participant data could not be obtained from all original diagnostic accuracy studies but only from 49%.
Ethics committee approval: Ethical approval was obtained by local ethics committees in the conduct of the primary studies within the COME-CCT Consortium.
Funding for this study: This work was supported by the joint programme of the German Research Foundation (DFG) and the German Federal Ministry of Education and Research (BMBF, 01KG1110) to PS and MD.
Author Disclosures:
Benjamin Dubourg: Nothing to disclose
Peter Schlattmann: Research/Grant Support: PS has support from the German Research Foundation, grants from the European Union and grants from Bayer Pharma AG; Grant Recipient: PS and MD had support from the joint programme of the German Research Foundation and the German Federal Ministry of Education and Research for the submitted work
Viktoria Wieske: Research/Grant Support: VW reports grant support from the FP7 Program of the European Commission for the randomized multicentre DISCHARGE trial (603266-2, HEALTH-2012.2.4.-2).
Marc Dewey: Other: M.D. is European Society of Radiology (ESR) Research Chair (2019–2022) and the opinions expressed in this presentation are the author's own and do not represent the view of ESR. Grant Recipient: EU (603266-2) DFG (DE 1361/14-1, DE 1361/18-1, BIOQIC GRK 2260/1, Radiomics DE 1361/19-1 [428222922] and 20-1 [428223139] in SPP 2177/1), Berlin University Alliance (GC_SC_PC 27), Berlin Institute of Health (Digital Health Accelerator). Other: Cardiac CT (Springer Nature). Other: Hands-on cardiac CT courses (www.ct-kurs.de) Institutional research agreements: Siemens, General Electric, Philips, Canon. Patent Holder: Professor Dewey holds a joint patent with Florian Michallek on dynamic perfusion analysis using fractal analysis (PCT/EP2016/071551).
Mario Walther: Nothing to disclose
Daniele Andreini: Nothing to disclose
Gianluca Pontone: Other: GP reports other grants from General Electric, grants from General Electric, other from Medtronic, other from Bracco, outside the submitted work.
Simon Andrzejewski: Nothing to disclose
Benjamin Weickert: Nothing to disclose

CTiR 12-3
Discussant of: Updated DISCHARGE Trial Pretest Probability Calculator in Stable Chest Pain: Collaborative Meta-Analysis of Cardiac CT (COME-CCT)
R. Vliegenthart; Groningen/NL

CTiR 12-4
The yield of chest x-ray or ultra-low-dose chest CT in emergency department patients suspected of non-traumatic pulmonary disease without respiratory symptoms or signs
E. Lejeune, *I. A. H. Van Den Berk*, M. M. N. P. Kanglie, T. van Engelen, S. Bipat, P. M. M. Bossuyt, J. Stoker, J. M. Prins; Amsterdam/NL
(inge.van.den.berk@suerte.nl)

Purpose: To evaluate the diagnostic accuracy of chest imaging when respiratory symptoms or signs of pneumonia are absent.
Methods or Background: In the OPTIMACT trial, consenting patients with suspected non-traumatic pulmonary disease at the emergency department (ED) were randomly allocated to undergo chest x-ray (CXR) (1210 patients) or ultra-low-dose chest CT (ULDCT) (1208 patients). Post-hoc, we identified patients with fever or elevated CRP but without respiratory symptoms or other signs of pneumonia. We calculated estimates of sensitivity and specificity for ULDCT and CXR in detecting pneumonia in this subgroup. We compared the baseline characteristics of this subgroup with those of patients with a final community-acquired pneumonia (CAP) diagnosis who had symptoms or signs of CAP.
Results or Findings: We identified 227 patients with fever or elevated CRP but no respiratory symptoms or other signs of pneumonia (116 after ULDCT; 111 after CXR). In the ULDCT group, 14 of these (12%) received a final diagnosis of pneumonia, eight (7%) in the CXR group. The sensitivity of ULDCT to detect pneumonia was significantly higher than that of CXR: 13/14 (93%) vs 4/8 (50%; p-value 0.02). The ULDCT specificity was 91/102 (89%) vs 97/103 (94%) for CXR (p-value 0.2). Compared to patients with symptoms and signs of pneumonia, more patients in this subgroup had a history of malignancies (22% vs 13%, p-value 0.01) or were immunocompromised (41% vs 27%; p-value <0.001).
Conclusion: Pneumonia can be the cause of fever or an elevated CRP in ED patients even if they do not exhibit respiratory symptoms or signs. When the objective is to exclude pneumonia, ULDCT's improved sensitivity is a significant advantage over CXR.
Limitations: No concealment of allocation.
Ethics committee approval: Ethics committee approval was obtained: NL57923.018.16.
Funding for this study: Innovation grant of the Amsterdam UMC ZonMW: 843001806.
Author Disclosures:
Jan M. Prins: Nothing to disclose
Shandra Bipat: Nothing to disclose
Tjitske van Engelen: Nothing to disclose
Jaap Stoker: Nothing to disclose
Maadrika Meenakshi Nirvana Phoelmatie Kanglie: Nothing to disclose
Inge Alma Henrica Van Den Berk: Nothing to disclose
Patrick M. M. Bossuyt: Nothing to disclose
Emile Lejeune: Nothing to disclose

CTiR 12-5
Discussant of: The yield of chest x-ray or ultra-low-dose chest CT in emergency department patients suspected of non-traumatic pulmonary disease without respiratory symptoms or signs
M. Benegas; Barcelona/ES

CTiR 12-6
COV-RADS as a classification system for the diagnosis of COVID-19 pneumonia in chest computed tomography (CT): a German nationwide multicentre validation study
M. J. Saehn[1], C. Yueksel[1], M. Kleines[1], R. Armbruster[2], A. M. Bucher[2], T. Penzkofer[3], C. K. Kuhl[1], M. Schulze-Hagen[1], P. Isfort[1]; [1]Aachen/DE, [2]Frankfurt a. Main/DE, [3]Berlin/DE

Purpose: The COV-RADS classification system for the diagnosis of SARS-CoV 2 has proven high diagnostic value in a locoregional analysis. Within the German nationwide Radiological Cooperative Network (RACOON), we validated COV-RADS within this multicentric scenario.
Methods or Background: A total of 2558 CTs were included in the analysis: Patients with confirmed SARS-CoV 2 (RT-PCR within 7 days before CT; n=701) and CT datasets of representative pulmonary pathologies (n=2014) and a control cohort of healthy individuals (n=115). All CTs were assessed using the COV-RADS classification system, which predicts the likelihood of the presence of COVID-19 pneumonia. Test quality criteria, Clopper-Pearson confidence intervals and ROC with AUC were calculated a) for a high sensitivity setting: patients with a positive RT-PCR and a COV-RADS score ≥ 3 were considered true positive, patients with a negative RT-PCR and a COV-RADS score ≤ 2 were considered true negative; b) for a high specificity setting: patients with a positive RT-PCR and a COV-RADS score ≥ 4 were considered true positive, patients with a negative RT-PCR and a COV-RADS score ≤ 2 were considered true negative.
Results or Findings: The test quality criteria for the high sensitivity setting were: sensitivity 85.3% [82.5-87.9%], specificity 71.6% [69.5-73.7%], PPV 52.6% [49.6-55.6%], NPV 93.0% [91.5-94.3%]. For the high specificity setting, sensitivity was 63.3% [59.6-66.9%], specificity 91.9% [90.6-93.11%], PPV 74.3% [70.5-77.8%], NPV 87.2% [85.6-88.6%]. AUC was 0.83 [0.76-0.90].
Conclusion: The COV-RADS classification system provided reliable results in the diagnosis of COVID-19 pneumonia using CT. The overall test criteria were acceptable. While sensitivity was high, specificity did not meet the expectations when compared to RT-PCR, even when the cutoff was shifted to aim for high specificity. COV-RADS 3 was determined as the most reasonable cutoff in our current setting.
Limitations: None.
Ethics committee approval: The ethics committee approval was obtained (EK086-21).
Funding for this study: RACOON is funded by the network-university-medicine (BMBF-grant-number: 01KX202).
Author Disclosures:
Peter Isfort: Nothing to disclose
Can Yueksel: Nothing to disclose
Tobias Penzkofer: Nothing to disclose
Marwin -Jonathan Saehn: Nothing to disclose
Michael Kleines: Nothing to disclose
Christiane K. Kuhl: Nothing to disclose
Rebecca Armbruster: Nothing to disclose
Maximilian Schulze-Hagen: Nothing to disclose
Andreas Michael Bucher: Nothing to disclose

CTiR 12-7
Discussant of: COV-RADS as a classification system for the diagnosis of COVID-19 pneumonia in chest computed tomography (CT): a german nationwide multicenter validation study
M. Arzanauskaite; Liverpool/UK

08:00-09:00 **Room M 4**

E³ - The Beauty of Basic Knowledge: A Survival Guide to Musculoskeletal Imaging

E³ 24C
Spinal disorders: how to get it right?

Moderator
I. Sudol-Szopinska; Warsaw/PL

Learning Objectives:
The vertebral endplate depicts the anatomical interface of the vertebral body and intervertebral disc. Focal pathology in either the disc or vertebra can give rise to endplate abnormalities, but systemic disease is also a consideration. An atraumatic vertebral body collapse is invariably pathological and requires full-imaging assessment to differentiate benign from a malignant aetiology. Tumours of the spine are not uncommon and can involve part of the vertebral body, the posterior arch, the IV-disc, and other vertebrae with the added risk of fracture and cord compression. An informed imaging approach with the knowledge and interpretative skills is crucial to getting it right.

E³ 24C-2
Vertebral endplate
F. M. H. M. Vanhoenacker; Antwerp/BE

Learning Objectives:
1. To review the relevant anatomy and histology of the vertebral endplate.
2. To discuss the disorders that may cause endplate involvement.
3. To discuss the differential diagnosis.
Author Disclosures:
Filip M.H.M. Vanhoenacker: Author: Vertebral endplate

E³ 24C-3
Vertebral body collapse
R. Lalam; Oswestry/UK
(radhesh.lalam@nhs.net)

Learning Objectives:
1. To understand the role of various imaging modalities in the assessment of vertebral collapse.
2. To be able to differentiate between benign and malignant causes of vertebral collapse on standard imaging techniques.
3. To appreciate the various problem-solving tools available when it is difficult to differentiate between benign and malignant vertebral collapse.

E³ 24C-4
Tumours
A. Bazzocchi; Bologna/IT
(abazzo@inwind.it)

Learning Objectives:
1. To review the epidemiology and the diagnostic approach to spine tumours and tumour-like conditions.
2. To become familiar with typical imaging patterns of spinal tumours.
3. To discuss the possibility imaging techniques offer to narrow down the differential diagnosis.

Panel discussion

08:00-09:00 **Room M 5**

ProCAncer-I Session

ProCAncer-I

Building bridges. From radiomics/AI research to clinical practice: the ProCAncer-I vision

ProCAncer-I-1
Chairpersons' introduction
M. Tsiknakis; Iraklion/GR

Learning Objectives:
1. To summarise the ProCAncer-I vision of translational research in the prostate cancer continuum.
2. To review strategies aimed at increasing translation from research to clinical practice.
3. To discuss the role of radiologists in AI projects.
4. To understand the main obstacles to the adoption of AI in the clinical setting.

ProCAncer-I-2
Main challenges in the adoption of radiomics/AI in clinical practice
N. Papanikolaou; Lisbon/PT
(nickolas.papanikolaou@research.fchampalimaud.org)

ProCAncer-I-3
Role of radiologists in radiomics/AI clinical projects
D. Regge; Turin/IT
(daniele.regge@ircc.it)

ProCAncer-I-4
Discussion
L. Martí-Bonmatí; Valencia/ES
H. C. Thoeny; Fribourg/CH
(Harriet.thoeny@h-fr.ch)
D. Akata; Ankara/TR
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)
I. Seimenis; Athens/GR
K. Marias; Iraklion/GR
Author Disclosures:
Harriet C. Thoeny: Advisory Board: Guerbet SA; Speaker: Guerbet SA
Emanuele Neri: Speaker: GE /Healthcare - ESAOTE-Ebit - Bayer

08:00-09:00 **Room O**

Refresher Course: Chest

RC 1204

Diagnostic precision in fibrotic lung disorders: lumpers and splitters

RC 1204-1
Chairperson's introduction
N. Sverzellati; Parma/IT
Author Disclosures:
Nicola Sverzellati: Advisory Board: Boehringer Ingelheim, Chiesi; Research Grant/Support: Chiesi; Speaker: Boehringer Ingelheim, Chiesi, Menarini, Janssen

RC 1204-2
Do we still need a diagnosis in fibrotic interstitial lung disease (ILD)?
S. Tomassetti; Florence/IT
(s.tomassetti@gmail.com)

Learning Objectives:
1. To understand how to appropriately correlate disease behaviour and predict the prognosis based on the different fibrotic ILDs diagnoses.
2. To understand the efficacy and safety of different treatment approaches tailored to the different fibrotic ILDs diagnoses.
3. To define progressive fibrotic ILDs and choose the best treatment option for this lumped group of fibrotic ILDs with similar disease behaviour.
Author Disclosures:
Sara Tomassetti: Speaker: Roche and Boehringer Ingelheim

RC 1204-3
HRCT features of individual fibrotic lung diseases
H. Prosch; Vienna/AT
(helmut.prosch@meduniwien.ac.at)

Learning Objectives:
1. To appreciate the importance of a systematic approach to fibrosing lung diseases.
2. To learn about the CT criteria of the most important fibrosing lung diseases.
3. To understand the importance of a multidisciplinary discussion for the diagnosis of fibrosing lung diseases.
Author Disclosures:
Helmut Prosch: Advisory Board: Boehringer Ingelheim, Roche, Sanofi, Janssen

RC 1204-4
Longitudinal imaging metrics in the evaluation of fibrotic lung diseases
A. Poellinger; Bern/CH

Learning Objectives:
1. To understand the reasons for evaluating fibrosis extent on imaging.
2. To understand the methods of assessing for longitudinal changes in fibrosing lung disease on CT and other imaging.
3. To understand the limitations and challenges for imaging in documenting longitudinal disease severity in fibrotic lung disease.

Panel discussion: Precision in diagnosis of fibrotic lung disorders

09:30-10:00 **Room A**

Plenary Lecture

PL 2

Plenary Lecture

Presiding
R. G. H. Beets-Tan; Amsterdam/NL

PL 2-1
Digitalisation and innovation: success factors for the future
S. Schwan; Basel/CH

10:30-11:30 **Open Forum #3 (ESR)**

Open Forum Session

Organised by EuroSafe Imaging

OF 13a

ESR iGuide: clinical decision support for imaging referrals

OF 13a-1
Chairperson's introduction
B. Brkljačić; Zagreb/HR

OF 13a-2
Medical imaging decision and support (MIDAS) study
T. J. Kroencke; Augsburg/DE
(thomas.kroencke@me.com)

Learning Objectives:
1. To learn about the study design of the MIDAS study.
2. To appreciate the implementation process of the ESR iGuide.
3. To understand measuring the impact of the ESR iGuide.

OF 13a-3
ESR iGuide pilot project CH Vic
M. Serrallonga-Mercader; Barcelona/ES
(martaserrallonga@gmail.com)

Learning Objectives:
1. To learn about the ESR iGuide implementation in CH Vic.
2. To appreciate the utilisation of the ESR iGuide by referring physicians.
3. To understand the importance of content localisation for best practices.

OF 13a-4
ESR iGuide implementation: National Guard Health Affairs
J. Sosna; Jerusalem/IL
(jacobs@hadassah.org.il)

Learning Objectives:
1. To learn about the ESR iGuide integration into a proprietary hospital information system.
2. To appreciate the role of CDS in radiology and hospital IT strategy.

Open forum discussion

10:30-11:30 **Open Forum #4 (ESR)**

Open Forum Session

OF 13b

Research networking: connecting with other ESR members on research projects

Moderators
M. Dewey; Berlin/DE
J. Stoker; Amsterdam/NL
A. van der Lugt; Rotterdam/NL

Learning Objectives:
The main objective of this session is to help ESR members connecting with others on research projects. In this session ESR, EIBIR and ESR Research topics will be presented that foster collaboration between countries, subspecialties, and other specialties. There will be sufficient room for discussion of these topics. Specially invited to attend this session are those who have attended at least four out of the five ESR/ESOR Fundamentals of Radiological Research Online Course since October 2021.

OF 13b-2
What to consider when designing research?
A. van der Lugt; Rotterdam/NL
(a.vanderlugt@erasmusmc.nl)
Author Disclosures:
Aad van der Lugt: Advisory Board: Siemens Healthineeers; Research Grant/Support: GE Healthcare, Philips Healthcare, Siemens Healthcare, Stryker, Cerenovus, Medtronic, Penumbra, Thrombolytic Science Inc; Speaker: Siemens Healthineers

OF 13b-3
How to improve research execution?
G. P. Krestin; Rotterdam/NL
Author Disclosures:
Gabriel P. Krestin: Advisory Board: Bracco Imaging, Gleamer, Ludwig Maximilian University Munich, MTD Group, NanoX Inc., Technion Israel Institute of Technology; Board Member: FLUIDDA BV, LeQuest BV; Other: Scientific Director EIBIR

OF 13b-4
Where will machine learning lead us?
M. Dewey; Berlin/DE
(marc.dewey@charite.de)
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

OF 13b-5
How to disseminate research results?
J. Stoker; Amsterdam/NL

Discussion

10:30-11:30 **Room 31/32**

Open Forum Session

Organised by the EFRS

OF 13R

Top tips in ultrasound 1: gallbladder, biliary tree, and kidneys

Moderator
K. Cronin; Dublin/IE

Learning Objectives:
1. To describe best practice, tips, and tricks for ultrasound examinations of the gallbladder, biliary tree, and kidneys.
2. To demonstrate and apply best practice, tips, and tricks for ultrasound examinations of the gallbladder, biliary tree, and kidneys.

OF 13R-2
Gallbladder and biliary tree ultrasound: presentation, live scanning demonstration, and questions and answer
R. Reeve; Portsmouth/UK

OF 13R-3
Renal ultrasound: presentation, live scanning demonstration, and questions and answers
A. Lunney; Dublin/IE

10:30-11:30 **Room D**

Refresher Course: Emergency Imaging

RC 1317

Penetrating injuries: how to image the patient and which findings are most useful for patient management?

RC 1317-1
Chairperson's introduction
M. Scaglione; Castel Volturno/IT

RC 1317-2
Imaging approach in penetrating injuries
M. Patlas; Hamilton, ON/CA
(patlas69@yahoo.com)

Learning Objectives:
1. To learn about possible imaging approaches in patients with penetrating injuries.
2. To understand the pros and cons of the different imaging approaches.
3. To learn about which imaging protocol is the most appropriate to adopt.
Author Disclosures:
Michael Patlas: Author: Springer, Elsevier

RC 1317-3
Subtle injuries in penetrating trauma
K. Linnau; Seattle, WA/US
(klinnau@u.washington.edu)

Learning Objectives:
1. To become familiar with subtle injuries in penetrating trauma.
2. To understand its clinical significance and implications.
3. To learn about the possible causes of misdiagnosis in penetrating trauma.

RC 1317-4
The role of interventional radiology in penetrating trauma
F. Giurazza; Naples/IT
(francescogiurazza@hotmail.it)

Learning Objectives:
1. To understand the role of interventional radiologists in penetrating trauma.
2. To become familiar with the spectrum of vascular and non-vascular injuries that may be treated by the interventional radiologist.
3. To learn about the most common interventional radiology treatments in patients with penetrating trauma.

Panel discussion: Which is the best imaging protocol to assess penetrating injuries and to plan the intervention?

10:30-11:30 **Room N**

Refresher Course: Head and Neck

RC 1308

How to write a staging report for head and neck cancer

RC 1308-1
Chairperson's introduction
R. Maroldi; Brescia/IT

RC 1308-2
What does a head and neck surgeon expect from a radiological report
M. Brunner; Vienna/AT
(markus.brunner@meduniwien.ac.at)

Learning Objectives:
1. To learn about the importance of accurate staging and delineation.
2. To list the information the clinician wants to know, including tumour extent, operability, and prognostic features.
3. To understand how to select lesions and lymph nodes for fine-needle aspiration.

RC 1308-3
Oral cavity, oropharyngeal, and laryngeal cancer
M. Becker; Geneva/CH
(minerva.becker@hcuge.ch)

Learning Objectives:
1. To identify the key imaging features affecting cancer staging in the oral cavity, oropharynx, and larynx.
2. To construct a concise and systematic imaging report for cancers involving these anatomical areas.
3. To be able to discuss both routine and more complex cases with the referring clinicians and to estimate the level of uncertainty in particular areas.

RC 1308-4
Sino-nasal and nasopharyngeal cancer
A. D. King; Hong Kong/CN

Learning Objectives:
1. To identify the key imaging features affecting sino-nasal and nasopharynx cancer staging.
2. To construct a concise and systematic imaging report for cancers involving these anatomical areas.
3. To be able to discuss both routine and more complex cases with the referring clinicians and to estimate the level of uncertainty in particular areas.

Panel discussion: Is there a role for structured reporting in head and neck cancer staging?

10:30-12:00 **Open Forum #2 (Young ECR)**

E³ - Young ECR Programme: Radiology Trainees Forum (RTF)

TF

Highlighted lectures on urological imaging

TF-1
Chairperson's introduction
M. Reim; Tartu/EE

Learning Objectives:
1. To learn the imaging protocol for the optimal acquisition of bladder MRI.
2. To learn the VI-RADS scoring criteria and category assessment.
3. To define the main clinical indications.
Author Disclosures:
Martin Reim: Board Member: Estonian Society of Radiology; Employee: Tartu University Hospital; Founder: Better Medicine OÜ; Share Holder: Better Medicine OU, Pfizer Corporation

TF-2
VI-RADS for bladder cancer
V. Panebianco; Rome/IT
(valeria.panebianco@uniroma1.it)

Learning Objectives:
1. To become familiar with performing a correct multiparametric US examination in patients presenting with acute scrotal pain.
2. To identify the main causes for acute scrotal pain using multiparametric US.
3. To discuss the use of other imaging techniques in equivocal cases at US.

TF-3
Imaging acute scrotal pain
M. Bertolotto; Trieste/IT
(michele.bertolotto@gmail.com)

Learning Objectives:
1. To explain the contrast-enhanced ultrasound technique in urogenital imaging.
2. To name and identify the main indications of CEUS in the assessment of renal and urogenital pathology, including transplant kidneys, advantages and limitations of CEUS with reference to conventional US, CT, and MRI.
3. To describe the patterns of benign and malignant lesions, and CEUS's role in excretory system obstructive and inflammatory processes.

TF-4
The role of CEUS in urogenital pathology
M. Radzina; Riga/LV
Author Disclosures:
Maija Radzina: Speaker: Canon, Bayer, Medtronic

Panel discussion: The key elements of urogenital radiology

10:30-12:00 **Room A**

Image Interpretation Quiz

IIQ
Around the world in 80 minutes

IIQ-1
Introduction
Y. Menu; Paris/FR

IIQ-2
Trip around the world
L. M. Sconfienza; Milan/IT
(io@lucasconfienza.it)
V. F. Muglia; Ribeirao Preto/BR
A. Snoeckx; Antwerp/BE
(Annemiek.Snoeckx@uza.be)
A. Ba-Ssalamah; Vienna/AT
(ahmed.ba-ssalamah@meduniwien.ac.at)

Author Disclosures:
Luca M. Sconfienza: Speaker: Samsung, Esaote, Pfizer, Novartis, Janssen Cilag, Abiogen, MSD, Merck Serono; Other: Bracco Imaging Italia
Annemiek Snoeckx: Advisory Board: Agfa; Speaker: Samsung
Ahmed Ba-Ssalamah: Speaker: Honoraria for lectures for Novartis, Siemens, Sanofi and Bayer

IIQ-3
Conclusion
Y. Menu; Paris/FR

10:30-12:00 **Room B**

E³ - Advanced Courses: Liver, Bile Ducts and Pancreas Imaging

E³ 1320a
Pancreatic cystic lesions: a multidisciplinary approach

E³ 1320a-1
Chairperson's introduction
N. Kartalis; Stockholm/SE
(nikolaos.kartalis@ki.se)

Learning Objectives:
1. To learn about the integrated diagnostic algorithm for the differential diagnosis of pancreatic cysts.
2. To discuss a patient- and lesion-tailored follow-up or treatment plan for pancreatic cysts.
3. To discuss the multidisciplinary management of patients with pancreatic cysts.

E³ 1320a-2
The diagnostic algorithm for imaging diagnosis of cystic pancreatic lesions
N. Kartalis; Stockholm/SE
(nikolaos.kartalis@ki.se)

E³ 1320a-3
Evaluation of cystic pancreatic lesions: lessons from the gastroenterologist
T. Seufferlein; Ulm/DE
(Thomas.Seufferlein@uniklinik-ulm.de)

E³ 1320a-4
How to manage cystic pancreatic lesions: what the surgeon expects from the radiologist
E. Rangelova; Gothenburg/SE
(elena.rangelova@gu.se)

E³ 1320a-5
Multidisciplinary tumour board: case-based panel discussion
N. Kartalis; Stockholm/SE
(nikolaos.kartalis@ki.se)

10:30-12:00 **Room C**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1319a
Prostate cancer screening, early detection, and individualised management: an interdisciplinary challenge

E³ 1319a-1
Chairperson's introduction
H.-P. Schlemmer; Heidelberg/DE
(h.schlemmer@dkfz.de)

Learning Objectives:
1. To understand the opportunities and limitations of imaging for screening and early detection of prostate cancer.
2. To appreciate the various options for individualised treatment of early-stage prostate cancer, including surgery, radiotherapy, focal therapies, and active surveillance.
3. To discuss the role of imaging for planning, guidance, and follow-up of therapy.
Author Disclosures:
Heinz-Peter Schlemmer: Advisory Board: Siemens; Speaker: Bracco, Bayer, Siemens

E³ 1319a-2
Screening and early detection of prostate cancer: the epidemiological and urologist's perspective
H. Van der Poel; Amsterdam/NL
(h.vd.poel@nki.nl)
Author Disclosures:
Henk van der Poel: Grant recepient: astellas, intuitive, storz; Research Grant/Support: on-target

E³ 1319a-3
Management of early-stage prostate cancer: the oncologist's perspectives on individualised management
D. Raggi; Milan/IT
Author Disclosures:
Daniele Raggi: Advisory Board: Astellas, Janssen, Gilead

E³ 1319a-4
Opportunities, limitations, and pitfalls of imaging: the radiologist's perspective
H.-P. Schlemmer; Heidelberg/DE
(h.schlemmer@dkfz.de)
Author Disclosures:
Heinz-Peter Schlemmer: Advisory Board: Siemens; Speaker: Bracco, Bayer, Siemens

E³ 1319a-5
Multidisciplinary tumour board: case-based panel discussion and take home messages
H.-P. Schlemmer; Heidelberg/DE
(h.schlemmer@dkfz.de)
Author Disclosures:
Heinz-Peter Schlemmer: Advisory Board: Siemens; Speaker: Bracco, Bayer, Siemens

10:30-12:00 **Room E2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1321

Neuroradiology: an update

E³ 1321-1
Intracranial infection and inflammation
P. M. Parizel; Perth, WA/AU

Learning Objectives:
1. To understand how to distinguish between infectious and non-infectious meningitis.
2. To become familiar with the imaging features of encefalitis and CNS vasculitis.
3. To illustrate the criteria for the differential diagnosis of ring-enhancing brain lesions.

E³ 1321-2
Imaging cranial nerves
J. W. Casselman; Bruges/BE

Learning Objectives:
1. To illustrate the imaging appearance of the most frequent cranial nerve lesions and to be aware of associated disorders.
2. To become familiar with the lesions on the different anatomical segments of the cranial nerves and with the imaging techniques used for their assessment.
Author Disclosures:
Jan Walther Casselman: Speaker: For Philips Healthcare and Cefla S.A.; Other: Receive visitors to see equipment from Philips Healthcare

10:30-12:00 **Room G**

E³ - Advanced Courses: Liver, Bile Ducts and Pancreas Imaging

E³ 1320b

Klatskin tumours: current and emerging evidence

E³ 1320b-1
Chairperson's introduction
F. Caseiro Alves; Coimbra/PT

Learning Objectives:
1. To be come familiar with the relevant information on preoperative imaging assessment for comprehensive staging.
2. To review the relevance of occult metastatic disease detected at staging laparoscopy or early recurrence after resection.
3. To discuss the indications for liver transplantation rather than resection or palliative chemoradiotherapy.
4. To become familiar with the role of preoperative biliary drainage for resectable and unresectable Klatskin tumours.

E³ 1320b-2
Radiology for staging
F. Caseiro Alves; Coimbra/PT
(caseiroalves@gmail.com)

E³ 1320b-3
Is my patient a good candidate for surgery?
G. Torzilli; Milan/IT
(guido.torzilli@hunimed.eu)

E³ 1320b-4
Interventional options for extrahepatic cholangiocarcinoma
R. Duran; Lausanne/CH
Author Disclosures:
Rafael Duran: Research Grant/Support: Society of Interventional Oncology, Boston Scientific, Guerbet

E³ 1320b-5
Multidisciplinary tumour board: case-based panel discussion
F. Caseiro Alves; Coimbra/PT

10:30-12:00 **Room K**

E³ - Advanced Courses: Cancer Imaging

Jointly organised by the ESR and ESMO

E³ 1318

Gastrointestinal stromal tumours (GIST): a multidisciplinary approach

E³ 1318-1
Chairpersons' introduction
D. Regge; Turin/IT
(daniele.regge@ircc.it)
G. Grignani; Candiolo/IT

Learning Objectives:
1. To highlight the importance of a multidisciplinary management of gastrointestinal stromal tumours.
2. To review the most recent developments in systemic and surgical treatment of gastrointestinal stromal tumours.
3. To discuss imaging findings and treatment response assessment of gastrointestinal stromal tumours and how to assist the oncologist/surgeon in providing the best treatment plan.

E³ 1318-2
Systemic treatment of GIST: the oncologist
G. Grignani; Candiolo/IT
Author Disclosures:
Giovanni Grignani: Advisory Board: nOVARTIS, bayer

E³ 1318-3
Surgical management of GIST: the surgeon
W. Allum; Sutton/UK
(william.allum@rmh.nhs.uk)

E³ 1318-4
Imaging of GIST: the radiologist
A. Laghi; Rome/IT
(andrea.laghi@uniroma1.it)
Author Disclosures:
Andrea Laghi: Advisory Board: Guerbet; Speaker: Bracco, Bayer, Guerbet, GE Healthcare

E³ 1318-5
Multidisciplinary tumour board: case-based panel discussion
D. Regge; Turin/IT
(daniele.regge@ircc.it)

10:30-12:00 **Room M 3**

Special Focus Session

SF 13

Palliative biliary drainage and stenting

SF 13-1
Chairperson's introduction
H.-U. Laasch; Manchester/UK
(h.laasch@nhs.net)
Author Disclosures:
Hans-Ulrich Laasch: Advisory Board: Cook Medical: Drainage board; Board Member: Minnova Medical Foundation

SF 13-2
Indications for percutaneous transhepatic cholangiography (PTC), drainage, and stenting
C. Moran; Cork/IE
O. J. O'Connor; Cork/IE
(oj.oconnor@ucc.ie)

Learning Objectives:
1. To be able to plan drainage and stenting procedures, including single- and multi-stage procedures.
2. To understand the options provided by endoscopy and endoscopic ultrasound (EUS).
3. To accept the importance of interdisciplinary collaboration and combined procedures.

SF 13-3
Does stent choice matter?
H.-U. Laasch; Manchester/UK
(h.laasch@nhs.net)

Learning Objectives:
1. To understand different stent constructions and their impact on functional outcome.
2. To be able to choose the optimal device for each patient.
3. To realise the importance for repeat procedures, endoscopically as well as percutaneously.

SF 13-4
Complications of percutaneous transhepatic cholangiography and drainage (PTCD) and stenting
R. Uberoi; Oxford/UK
(Raman.Uberoi@ouh.nhs.uk)

Learning Objectives:
1. To develop strategies for risk reduction.
2. To be able to anticipate and manage complications.
3. To understand the value of patient pre-assessment and follow-up.

Panel discussion: Who should be in charge of palliative biliary decompression and how can the need for reintervention be minimised?

10:30-12:00 **Room M 4**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1319b

Breast lesions with uncertain malignant potential: a multidisciplinary approach

E³ 1319b-1
Chairperson's introduction
J. Camps Herrero; Valencia/ES
(jcamps@riberasalud.es)

Learning Objectives:
1. To recognise key imaging features that are typical for lesions of uncertain malignant potential.
2. To recognise potential triggers that may indicate more extensive disease.
3. To understand different methods to further classify these lesions and provide a definite diagnosis.
Author Disclosures:
Julia Camps Herrero: Advisory Board: Bayer, Becton Dickinson

E³ 1319b-2
Detection of lesions of uncertain malignant potential: relation to imaging type and biopsy method, the radiologist's perspective
C. K. Kuhl; Aachen/DE
(ckuhl@ukaachen.de)

E³ 1319b-3
Pathological characterisation of lesions of uncertain malignant potential: how 'uncertain' is uncertain, the pathologist's perspective
C. Vlahu; Amsterdam/NL
(c.vlahu@nki.nl)

E³ 1319b-4
Should lesions of uncertain malignant potential always be excised? The breast surgeon's perspective
S. McIntosh; Belfast/UK
(s.mcintosh@qub.ac.uk)
Author Disclosures:
Stuart McIntosh: Advisory Board: Roche, Lilly, Veracyte; Investigator: Novartis, Sanofi, Almac; Research Grant/Support: Novartis, Sanofi, Almac (institutional); Speaker: BD, Roche, Daiichi-Sankyo

E³ 1319b-5
Multidisciplinary tumour board: case-based panel discussions
J. Camps Herrero; Valencia/ES
(jcamps@riberasalud.es)
C. Vlahu; Amsterdam/NL
(c.vlahu@nki.nl)
Author Disclosures:
Julia Camps Herrero: Advisory Board: Bayer, Becton Dickinson

10:30-12:00 **Room M 5**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1319c

Obscure gastrointestinal bleed: a multidisciplinary approach

E³ 1319c-1
Chairperson's introduction
M. J. Gollub; New York, NY/US

Learning Objectives:
1. To recognise imaging features of obscure gastrointestinal bleed.
2. To identify proper indications for CT angiography versus CT enterography.
3. To understand the therapeutic options and how imaging informs/affects treatment.

E³ 1319c-2
Obscure GI bleed, which imaging should I use? The radiologist's perspective
D. J. M. Tolan; Leeds/UK
(damian.tolan@nhs.net)
Author Disclosures:
Damian J.M. Tolan: Speaker: Guerbet

E³ 1319c-3
How to manage: the gastroenterologist's perspective
J. P. H. Drenth; Nijmengen/NL
(Joost.Drenth@radboudumc.nl; joostphdrenth@cs.com)
Author Disclosures:
Joost PH Drenth: Other: Editor In Chief UEG Journal

E³ 1319c-4
How to manage: the interventional radiologist's perspective
A. Boscà Ramon; Valencia/ES
(antonibosca@gmail.com)

E³ 1319c-5
Multidisciplinary tumour board: case-based panel discussion
M. J. Gollub; New York, NY/US
D. J. M. Tolan; Leeds/UK
(damian.tolan@nhs.net)
J. P. H. Drenth; Nijmengen/NL
A. Boscà Ramon; Valencia/ES
(antonibosca@gmail.com)
Author Disclosures:
Damian J.M. Tolan: Speaker: Guerbet

10:30-12:00 **Room O**

E³ - European Diploma Prep Sessions

E³ 1323
Cardiac and vascular

E³ 1323-1
Chairperson's introduction
M. Francone; Milan/IT

Learning Objectives:
To understand the basic principles and techniques of cardiovascular imaging, including CT and MRI of the heart and great vessels. To become familiar with the imaging presentations of disorders of the endocardium, the pericardium, and the cardiac valves. To understand the MRI presentation of disorders of the myocardium.

E³ 1323-2
Cardiovascular imaging: the basics
M. Hrabak Paar; Zagreb/HR
(maja.hrabak.paar@mef.hr)

Learning Objectives:
1. To understand the anatomy, normal variants, and abnormalities of the heart and great vessels.
2. To describe the technical aspects and methodology of cardiac and vascular CT.
3. To describe the technical aspects and methodology of cardiac and vascular MRI.

E³ 1323-3
Cardiovascular imaging: myocardium and pericardium
J. Bogaert; Leuven/BE

Learning Objectives:
1. To describe the diagnostic evaluation and imaging presentation of ischaemic heart disease.
2. To understand the diagnostic evaluation and imaging presentation of myocarditis.
3. To become familiar with the causes and imaging presentations of pericardial effusion.

E³ 1323-4
Cardiovascular imaging: valves, endocardium, and aorta
C. Loewe; Vienna/AT
(christian.loewe@meduniwien.ac.at)

Learning Objectives:
1. To recognise the imaging presentation of the different forms of valvular disease.
2. To understand the causes and imaging presentations of endocarditis.
3. To describe the diagnostic evaluation and imaging presentation of common diseases of the great vessels, including aortic dissection and aneurysms.
Author Disclosures:
Christian Loewe: Speaker: GE Healthcare; Siemens Healthineers

11:00-12:00 **Tech Gate Auditorium**

Patients in Focus

IF 13
Physische Stärkung

Moderator
J. Tscheppe; Vienna/AT

IF 13-2
Fit und aufmerksam im Alltag
F. Laterman; Vienna/AT

Learning Objectives:
1. Integration achtsamer Momente in den Alltag.
2. Ich bin nicht meine Gedanken.
3. Bedeutsamkeit von Dankbarkeitsübungen.

IF 13-3
Seelische und psychische Stärkung durch Nahrungsergänzungsmittel
G. Sprinzl; Vienna/AT
(georg.sprinzl@teamsante.at)

Learning Objectives:
1. Der Ernährungsstatus der österreichischen Bevölkerung.
2. Naturküche versus industriell verarbeiteten Lebensmitteln (Convenience Food) – Was ist an Nährstoffen drinnen?
3. Wann machen Nahrungsergänzungsmittel (NEM) Sinn?

IF 13-4
Interview: Schulmedizin und Magnetismus - ein unschlagbares Team
A. Schratter-Sehn; Vienna/AT
(Annemarie.schratter@gmail.com)
J. Tscheppe; Vienna/AT

Learning Objectives:
1. Interview mit Prim. Univ. Doz. Dr. Schratter-Sehn, Institutsvorständin der Radioonkologie des KAV - Klinik Favoriten in Wien. Prim. Univ. Doz. Dr. Schratter-Sehn praktiziert auch Magnetismus.

IF 13-5
Take your WINX and fly: Breite deine Flügel aus und flieg
F. Fitzal; Vienna/AT
C. Justich; Vienna/AT
(cjustich@me.com)

Learning Objectives:
1. Was kann die Schulmedizin? Fachspezifische Erfahrungen zum Thema Brustkrebs.
2. Die Kombination von Schulmedizin mit Erfahrungen in der Natur und einem bewussten Körpergefühl - Erfahrungswerte als Schulmediziner.
3. WINX: die Entstehung der Idee und die Auswirkungen, gemeinsam mit seinen Patienten ein Ziel zu erreichen.
4. Niki Bergliebe - wie sich ihr Leben nach der Teilnahme an einem WINX Wochenende verändert hat.

IF 13-6
Schreibe, um deine Seele zu treffen
E. Steinthaler; Vienna/AT
(post@evelynsteinthaler.com)

Learning Objectives:
1. Möglichkeiten aufzeigen, wie durch das Schreiben während einer Krankheit die eigene Situation klarer gesehen und "neu" bewertet werden kann.
2. Eröffnung neuer Welten und wertfreier Umgang mit sich selbst durch intensives Schreiben.
3. Bedeutsamkeit von Ritualen und einem "Denken über den Tellerrand".
4. Verständnis schaffen, wie unterstützend das Schreiben sein kann.

12:15-13:30 **Tech Gate Auditorium**

Patients in Focus

IF 14b
Zucker versus intelligenter Zucker: Nahrung zu seinen Gunsten nützen!

Moderator
C. Justich; Vienna/AT

IF 14b-2
Geführte Meditation
A. Lombard Puntschart; Vienna/AT
(annemarie@venusfrequency.com)

Learning Objectives:
1. Steigerung von Widerstandsfähigkeit und Vitalität.
2. Erreichen eines Gefühls der Vollständigkeit, Zentriertheit und Bodenständigkeit.
3. Erleben der sich wandelnden Natur des Körpers und Geistes, der Stärke und Stabilität, und der Erfahrung der tiefergehenden Ruhe, Stille und Weisheit.

IF 14b-3
Gesundheit durch die Kraft der Nahrung: TCM und Ernährung als Begleitung in Heilungsprozessen
M. Puntigam; Vienna/AT
(mp@tcmberatung.at)

Learning Objectives:
1. Selbstverantwortung und eine entsprechende Lebensweise als Basis für Gesundheit und Heilung.
2. Naturheilkunde und Ernährung als wichtiger Beitrag zur Gesundheit.
3. Ernährung und ein gesunder Stoffwechsel als Grundlage für die Gesundheit.

IF 14b-4
Bedeutung des Blutzuckers für Krankheiten
J. Coy; Monheim/DE

Learning Objectives:
1. Erklärung, wie hoher Blutzucker uns krank macht.
2. Aktivierung der Fettverbrennung mit Hilfe des richtigen Zuckers.
3. Veranschaulichung, wie man mit dem richtigen Zucker Entzündungen hemmen und Zähne vor Karies schützen kann.
Author Disclosures:
Johannes Coy: Advisory Board: I owner of patents for the use of TKTL1 and coowner of companies distributing sugars

Diskussion: Wie kann man Nahrung gezielt nutzen? Warum hat die Verwendung von intelligentem Zucker einen wesentlichen Einfluss auf die Gesundheit?

12:30-13:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 14Y
Meet the professors: part 3

OF 14Y-1
Chairperson's introduction
S. Afat; Tübingen/DE

Learning Objectives:
Distinguished professors of radiology are invited, together with their younger colleagues, to share their experience, their vision, and give advice and guidance to the younger generation of radiologists.

OF 14Y-2
Making the most of opportunities: what I have learnt
E. Sala; Cambridge/UK

OF 14Y-3
Why to become a radiologist in 2022?: my personal view
A. Laghi; Rome/IT
(andrea.laghi@uniroma1.it)
Author Disclosures:
Andrea Laghi: Advisory Board: Guerbet; Speaker: Bracco, Bayer, Guerbet, GE Healthcare

Discussion

12:30-13:30 **Open Forum #3 (ESR)**

Open Forum Session

Organised by the ESOR

OF 14a
One year fellowship: what is the gaining - tips and tricks to extract the perfume

OF 14a-1
Chairperson's introduction
S. Franchi-Abella; Le Kremlin-Bicêtre/FR

OF 14a-2
One year fellowship: what is the gaining
S. Nougaret; Montpellier/FR

Learning Objectives:
1. To question the benefit(s) of fellowships.
2. To discuss the main gains: new practice, collaboration, experience.
3. To highlight the need for preparation and anticipation.

OF 14a-3
Tips and tricks to extract the perfume
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)

Learning Objectives:
1. To question the benefit(s) of fellowships.
2. To discuss the main gains: new practice, collaboration, experience.
3. To highlight the need for preparation and anticipation.
Author Disclosures:
Mathias Prokop: Research Grant/Support: Siemens, Canon; Speaker: Siemens, Canon, Bracco

Open forum discussion

12:30-13:30 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the ESR Research Committee

OF 14b
Collaborating on research: how can I get involved in ESR research activities?

Moderator
M. Dewey; Berlin/DE

Learning Objectives:
This session will show case the activities of the ESR Research Committee, such as ESR collaboration with radiological subspecialities on research, presentation of the first grantees of the 2020 ESR research seed grants and many other collaboration activities of the Research Committee.

OF 14b-2
Our joint approach with subspecialty and national societies to collaboration in research
J. Stoker; Amsterdam/NL

Research Seed Grantees 2020

OF 14b-3
Reliability of cardiothoracic ratio as an estimate of cardiac enlargement compared to gold standard MRI parameters
M. Arzanauskaite; Liverpool/UK

OF 14b-4
RISK – Risk Maps using T2 mapping and Diffusion MR Sequences of the Prostate
L. Caldeira; Cologne/DE
(liliana.caldeira@uk-koeln.de)

OF 14b-5
MRI-assessed myocardial deformation of the systemic right ventricle in patients with transposition of the great arteries
M. Hrabak Paar; Zagreb/HR
(maja.hrabak.paar@mef.hr)
Author Disclosures:
Maja Hrabak Paar: Research Grant/Support: ESR Research Seed Grant 2020

OF 14b-6
AI-driven MR-based imaging of tumor hypoxia
I. Kurilova; Amsterdam/NL
(ieva.kurilova@gmail.com)
Author Disclosures:
Ieva Kurilova: Grant recepient: ESR/EIBIR Research Seed Grant

OF 14b-7
Spatio-temporal cardiac motion patterns in the non-invasive diagnosis of myocarditis
F. C. Laqua; Greifswald/DE
Author Disclosures:
Fabian C. Laqua: Research Grant/Support: Seed Grant by European Society of Radiology / European Institute for Biomedical Imaging Research, Grant German Research Foundation (DFG)

OF 14b-8
Optimization and validation of highly accelerated compressed sensing whole-heart 4D-Flow imaging
C. Reiter; Graz/AT
(clemens.reiter@medunigraz.at)

OF 14b-10
Integration of a Retina U-Net algorithm for the automated detection of primary lung cancer in clinical workflows
T. Weikert; Basle/CH
(thomasjohannes.weikert@usb.ch)

OF 14b-11
Research Grantee 2022 Awards
M. Dewey; Berlin/DE
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, AuntMinnie

Panel discussion: Ask all the questions you never dared to ask!

12:30-13:30 **Room 31/32**

Open Forum Session

Organised by the EFRS

OF 14R

Top tips in ultrasound 2: common emergency musculoskeletal referrals

Moderator
D. Kearney; Dublin/IE

Learning Objectives:
1. To describe best practice, tips, and tricks for ultrasound examinations of emergency musculoskeletal referrals.
2. To demonstrate and apply best practice, tips, and tricks for ultrasound examinations of emergency musculoskeletal referrals.

OF 14R-2
Achilles' tendon: presentation, live scanning demonstration, and questions and answers
K. Cronin; Dublin/IE
(kevin.cronin@ucd.ie)

OF 14R-3
Shoulder: presentation, live scanning demonstration, and questions and answers
K. Cronin; Dublin/IE
(kevin.cronin@ucd.ie)

12:30-13:30 **Room A**

Round Table Session

RT 14

Building bridges: how to be successful in multidisciplinary research

RT 14-1
Chairpersons' introduction
V. Vilgrain; Clichy/FR
B. Brkljačić; Zagreb/HR

Learning Objectives:
1. To understand the importance of teaming up with other medical professionals to achieve successful research that will impact patient outcomes.
2. To learn how to start a clinically oriented research project involving multiple disciplines.
3. To understand the importance of involving the different stakeholders during each project stage.
4. To know which skills are required to run multidisciplinary research successfully.
5. To learn the important role of radiologists in designing and executing clinical trials.

RT 14-2
How do I start and successfully run a multidisciplinary clinical research
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

RT 14-3
Discussion
L. Martí-Bonmatí; Valencia/ES
C. Catalano; Rome/IT
A. Spinazzi; Monroe Township, NJ/US

12:30-13:30 **Room B**

E^3 - The Beauty of Basic Knowledge: Pancreas

E^3 25D

Cystic neoplasms

Moderator
R. Manfredi; Rome/IT

E^3 25D-2
Intraductal papillary neoplasms
B. I. Choi; Seoul/KR

Learning Objectives:
1. To learn about the classification of cystic pancreatic neoplasms.
2. To appreciate the classification of intraductal papillary mucinous neoplasms (IPMNs).
3. To understand the diagnostic imaging findings of IPMNs.

E^3 25D-3
Other cystic pancreatic neoplasms
G. Zamboni; Verona/IT
(gzamboni@hotmail.com)

Learning Objectives:
1. To understand the diagnostic imaging findings of other cystic neoplasms.
2. To appreciate the differential diagnosis of pancreatic cystic lesions.
3. To understand the follow-up of cystic pancreatic neoplasms.

12:30-13:30 **Room C**

E³ - The Beauty of Basic Knowledge: A Survival Guide to Musculoskeletal Imaging

E³ 24D

MSK infection: what are the clues?

Moderator
F. Kainberger; Vienna/AT

Learning Objectives:
The imaging manifestation of infection are varied and depend on a number of factors, such as site, age, duration, pathogen, immune status, co-morbidity, and previous treatment. Complications can also develop and be part of the imaging spectrum. In combination, these manifestations and complications provide the clues to the radiologist/clinician of the underlying infection. Their detection varies and is dependent on the imaging modality used, with each having strengths and weaknesses.

E³ 24D-2
Long bones
J. C. Vilanova; Girona/ES
(kvilanova@comg.cat)

Learning Objectives:
1. To recognise the imaging features of long bone infection correlated with the underlying pathological process.
2. To provide the multimodality imaging approach in bone infection.
3. To describe the potential advantages that advanced MR imaging techniques provide for bone infection assessment.

E³ 24D-3
Joints
J. Kramer; Linz/AT
(kramer@ctmri.at)

Learning Objectives:
1. To become familiar with the epidemiological considerations.
2. To review the clinical symptoms and laboratory findings.
3. To discuss the various imaging techniques, with a focus on MRI.
4. To identify the key findings of imaging.
5. To learn the differential diagnosis.

E³ 24D-4
Spine
A. Cotten; Lille/FR
(anne.cotten@chru-lille.fr)

Learning Objectives:
1. To identify the early features of spinal infection on MR images.
2. To recognise atypical presentations of spinal infection.
3. To list the main differential diagnosis of spinal infection on MR images.

Panel discussion

12:30-13:30 **Room E2**

ESR meets China

Meets 14

Radiology vs artificial intelligence (AI) in China

Presiding
A. Brady; Cork/IE
S. Liu; Shanghai/CN

Meets 14-1
Welcome and introduction
A. Brady; Cork/IE
S. Liu; Shanghai/CN
(cjr.liushiyuan@vip.163.com)

Learning Objectives:
1. To appreciate the value of the co-joint session between ESR and CSR, and the great role of ESR in the world.
2. To outline the history of collaboration between the two societies.
3. To discuss the prospects for a strong cooperation between the two societies in the future, especially in AI.

Meets 14-2
Current status and challenge of AI application in radiology in China
S. Liu; Shanghai/CN
(cjr.liushiyuan@vip.163.com)

Learning Objectives:
1. To learn about the changes in policies and regulations in the field of AI in China.
2. To learn about the current distribution and authorization status of AI products in China.
3. To understand the current application status in hospitals.
4. To learn about the current challenges facing China's development in medical imaging AI.

Meets 14-3
Application of AI in lung disease
L. Fan; Shanghai/CN
(fanli0930@163.com)

Learning Objectives:
1. To learn about the research progress of radiomics and AI in lung nodule detection, diagnosis and differential diagnosis, and prediction of gene mutation.
2. To learn about the research progress of radiomics and AI in lung infection detection and quantitative evaluation.
3. To learn about the AI-based chest scanning and reconstruction technique.

Meets 14-4
Application of AI in cerebrovascular disease: perspective from China
L. J. Zhang; Nanjing/CN

Learning Objectives:
1. To provide an overview of the applications of AI in cerebravascular disease.
2. To understand the Chinese researchers' perspective of AI in the management of cerebravascular disease.
3. To learn about the basic rules of AI in cerebravascular disease.

Meets 14-5
Application of AI in tumour management
Z. Liu; Guangzhou/CN
(zyliu@163.com)

Learning Objectives:
1. To learn about the application of AI in tumour management, including screening, lesion detection, prognostication, and treatment evaluation.
2. To showcase that AI products are widely used in many Chinese hospitals.
3. To give an overview of the challenges faced in the clinical implication of the AI models, including model generalisation, ethics, economic cost-effectiveness, policy regulation, etc.

12:30-13:30 **Room M 4**

E³ - The Beauty of Basic Knowledge: Problem Solving Tips and Tricks for Brain Imaging

E³ 30C

Cerebral manifestations of systemic diseases

Moderator
C. A. Mallio; Rome/IT

E³ 30C-2
Metabolic and toxic encephalopathies and myelopathies
M. Caulo; Chieti/IT
(massimo.caulo@itab.unich.it)

Learning Objectives:
1. To review the most common imaging findings in metabolic encephalopathies and myelopathies.
2. To discuss the causes of these conditions (medications, alcohol, toxins, drugs, thiamine deficiency, hepatic failure, and electrolyte/glucose/osmotic imbalances).
3. To define Wernicke encephalopathy.

E³ 30C-3
Granulomatous disorders
D. Lyndon; London/UK
(d.p.lyndon@gmail.com)

Learning Objectives:
1. To illustrate how non-caseating granulomatous diseases involve the central nervous system (not including tuberculosis).
2. To review the imaging hallmarks of sarcoid in the central nervous system (CNS).
3. To review the imaging hallmarks of Langerhans cell histiocytosis in the CNS.
4. To discuss other (rare) disease conditions.

E³ 30C-4
Intracranial metastases revisited
A. Lasocki; Melbourne, VIC/AU

Learning Objectives:
1. To demonstrate the imaging findings of intracranial metastatic disease and how they correlate with the mechanism of spread (haematogenic versus cerebral spinal fluid borne).
2. To become familiar with how intraparenchymal (cerebrum, cerebellum) metastases can reveal information about the primary tumour.
3. To discuss how to best diagnose dural and leptomeningeal metastatic spread.

12:30-13:30 **Room O**

Patients in Focus

Jointly organised by the ESR and ECO (European Cancer Organisation)

IF 14a

The future relationship between radiologist and patient: what do we want to see?

Moderators
L. E. Derchi; Genoa/IT
M. Aapro; Genolier/CH

IF 14a-2
Introduction
L. E. Derchi; Genoa/IT

Learning Objectives:
1. To learn about the importance of communication, including body language, mimicking, and language, and what is important to the patient and expected from radiologists and radiographers.
2. To demonstrate the opportunities that artificial intelligence creates on all levels, even freeing up time for "patient to radiologist" contact and communication.
3. To understand the need of a uniform presence for the public to set common standards across national borders.

IF 14a-3
Oncologist and radiologist: all hands on the tumour
M. Aapro; Genolier/CH
(Matti.Aapro@europeancancer.org)

Learning Objectives:
1. To learn how radiologists are vital team members in cancer-related diagnostic and treatment decisions.
2. To appreciate that the diagnostic and treatment team works together for the benefit of the patients. "If you want to go far, go together, if you want (need) to go fast, go alone".
3. To understand that the radiologist must become a top consultant to his or her colleagues, also in the multi-professional tumour board.
Author Disclosures:
Matti Aapro: Board Member: European Cancer Organisation

IF 14a-4
Patient view: what do patients expect and patient rights
C. Cruwys; Glanges/FR

Learning Objectives:
1. To learn that patients do not always express their expectations.
2. To appreciate that innovative techniques in the back-office are very important, but do not necessarily contribute to the presumed quality of delivery of service.
3. To learn about patient rights, the European Code of Cancer Practice.
4. To understand that in this complex world of new and innovative technologies, direct communication with the patients is key to patient satisfaction and quality of life.

IF 14a-5
Panel discussion: How can we change the role of the radiologist to integrate them more in patient care/outpatient clinics?
D.-G. Carrié; Toulouse/FR
(dominiquecarrie@wanadoo.fr)

14:00-15:00 **Open Forum #2 (Young ECR)**

Open Forum Session

Organised by the ESR Patient Advisory Group (ESR-PAG)

OF 15Y

Communication with patients

Moderators
E. Briers; Hasselt/BE
C. Cruwys; Glanges/FR

OF 15Y-2
Introduction
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

OF 15Y-3
What radiologists, young and old, need to know about patients' expectations
C. Cruwys; Glanges/FR
D.-G. Carrié; Toulouse/FR
(dominiquecarrie@wanadoo.fr)

Learning Objectives:
1. To show the radiologist community patients' expectations before, during and after their imaging examination.
2. To explain patients' needs from the imaging professionals, from the secretary to radiographer and radiologist.
3. To better understand (using new tools) why imaging centre organisations should be more patient-centred.

OF 15Y-4
Tips and tricks for young radiologists in communication with patients: a clinical radiologist experience
D.-G. Carrié; Toulouse/FR
(dominiquecarrie@wanadoo.fr)

Learning Objectives:
1. To show the challenges of being a young, inexperienced radiologist when dealing with patients.
2. To learn why radiologists may not be experts on all medical conditions but are imaging experts.
3. To help the young radiologist in difficult face to face situations with patients, giving some simple tips and tricks.

OF 15Y-5
The important role of a radiologist as an innovative gatekeeper and how their workflow can be improved
J. Birch; Poole/UK
(judy_b@dsl.pipex.com)

Learning Objectives:
1. To outline the important role of the radiologist to the patient as a gatekeeper and to show why it is important to be innovative as a radiologist.
2. To show that successful communication is improving the workflow for the radiologist and the experience of the patient and to summarise what belongs to a successful communication.
3. To introduce concrete examples that were developed by the ESR PAG to be implemented to improve communication, workflow and patients experience.
Author Disclosures:
Judy Birch: Advisory Board: ESR PAG; CEO: Pelvic Pain Support Network; Research Grant/Support: IMI Paincare

Panel discussion: To communicate or not to communicate: are we satisfied with the level and quality of communication with patients and radiologists in the radiology department?

14:00-15:00 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the European Institute for Biomedical Imaging Research (EIBIR)

OF 15b

Image collection: opportunities for succeeding in imaging research

Chairperson's introduction
G. P. Krestin; Rotterdam/NL
K. Riklund; Umea/SE
(katrine.riklund@umu.se)

Learning Objectives:
The objective of this session is to inform the audience of the results of the EIBIR-supported clinical study MIPA, the EIBIR Imaging Biobank Catalogue, and the EIBIR project management and support services for research initiatives.
Author Disclosures:
Katrine Riklund: Board Member: CMRAD AB, DICOM PORT AB

OF 15b-3
Magnetic resonance imaging before breast cancer surgery: results of an observational multicentre international prospective analysis (MIPA)
F. Sardanelli; San Donato Milanese/IT
(francesco.sardanelli@unimi.it)
Author Disclosures:
Francesco Sardanelli: Advisory Board: Bayer, Bracco, DeepTrace Technologies, General Electric; Equipment Support Recepient: General Electric; Research Grant/Support: Bayer, Bracco, General Electric; Speaker: Bayer, General Electric

OF 15b-4
EIBIR Imaging Biobank Catalogue: find and identify datasets for imaging research
A. Gutierrez; Rotterdam/NL

OF 15b-5
Succeeding in imaging research with help from EIBIR
P. Gordebeke; Vienna/AT
(pgordebeke@eibir.org)

Open forum discussion

14:00-15:00 **Room 31/32**

Open Forum Session

Organised by the EFRS

OF 15R

Top tips in ultrasound 3: thyroid and lower extremity venous ultrasound

Moderator
R. Reeve; Portsmouth/UK

Learning Objectives:
1. To describe best practice, tips, and tricks for ultrasound examinations of the thyroid and lower extremity venous ultrasound.
2. To demonstrate and apply best practice, tips, and tricks for ultrasound examinations of the thyroid and lower extremity venous ultrasound.

OF 15R-2
Thyroid ultrasound: presentation, live scanning demonstration, and questions and answers
G. Johnson; Manchester/UK
(gerry.johnson@tgh.nhs.uk)

OF 15R-3
Lower extremity venous ultrasound: presentation, live scanning demonstration, and questions and answers
G. Orpen; Dublin/IE
(orpen31@gmail.com)

14:00-15:00 **Room A**

Round Table Session

RT 15

Building bridges: the role of the radiologist in 2030

RT 15-1
Chairpersons' introduction
R. G. H. Beets-Tan; Amsterdam/NL
A. Brady; Cork/IE

Learning Objectives:
This session aims to address the future of radiology and the critical role of the radiologist in multidisciplinary patient management. A panel of radiologists, clinicians and patient advocates will share their perspectives on how radiologists should practice adding value to the patient outcome.

RT 15-2
The new role of the radiologist: report from the ESR survey
A. G. Rockall; London/UK

Learning Objectives:
1. To understand the value of subspecialised, highly clinical radiologists.
2. To learn how subspecialisation will influence radiology training programmes.
3. To understand whether subspecialty societies can enhance subspecialisation in radiology by highlighting radiology led research and teaching.
4. To learn about the opportunities to free radiologists' time for value-based input in multidisciplinary patient management through artificial intelligence and the delegation of tasks to radiographers, data scientists, and engineers in daily radiology workflows.

RT 15-3
Panel discussion: Radiology in 2030: how will we need to practice adding value to the patient?
A. G. Rockall; London/UK
E. Voest; Amsterdam/NL
G. L. Beets; Amsterdam/NL
(g.beets@nki.nl)
G. Spurrier-Bernard; Auvergne/FR
(gilliosa.spurrier-bernard@mpneurope.org)
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)
Author Disclosures:
Emanuele Neri: Speaker: GE /Healthcare - ESAOTE-Ebit - Bayer

14:00-15:00 **Room D**

Refresher Course: Musculoskeletal

Jointly organised by the ESHNR and ESSR

RC 1510
Maxillofacial and dental imaging

RC 1510-1
Chairpersons' introduction
F. M. H. M. Vanhoenacker; Antwerp/BE
F. P. Kuhn; Zurich/CH
Author Disclosures:
Filip M.H.M. Vanhoenacker: Author: Guest editor maxillofacial and dental MSK imaging SMR oct 2020, see slide 2

RC 1510-2
What does the clinician expect from the radiologist?
D. Haba; Iasi/RO
(danihaba@yahoo.com)

Learning Objectives:
1. To discuss the main indications for imaging of the jaws and dentition.
2. To discuss the requirements for imaging quality.
2. To discuss what the radiologist should mention in the report.

RC 1510-3
Pre-and postimplant imaging of dental implants
A. Bernaerts; Antwerp/BE
(Anja.Bernaerts@gza.be)

Learning Objectives:
1. To repeat the imaging anatomy of the jaw and dentition.
2. To discuss the role of cone-beam CT in preoperative imaging.
3. To demonstrate imaging of implants complications.

RC 1510-4
Dental and skeletal imaging in forensic age estimation
J. De Tobel; Leuven/BE
(jannick.detobel@kuleuven.be)

Learning Objectives:
1. To discuss the various methods of age estimation.
2. To discuss the strength of each method.
3. To discuss the imaging algorithm.

Panel discussion: How to improve multidisciplinary cooperation between dentists, oral surgeons, (musculoskeletal and head and neck) radiologists, and pathologists?

14:00-15:30 **Room B**

E^3 - Advanced Courses: Lung, Mediastinum and Pleural Imaging

E^3 1531
Lung cancer: a multidisciplinary approach in real life

E^3 1531-1
Chairperson's introduction
H. Prosch; Vienna/AT
(helmut.prosch@meduniwien.ac.at)

Learning Objectives:
1. To conduct the initial staging of lung cancer.
2. To review the management of patients according to the tumour molecular profile and PDL1 expression.
3. To integrate the indications, contra-indications, and results of thermal ablation techniques in early-stage lung cancer.
Author Disclosures:
Helmut Prosch: Advisory Board: Boehringer Ingelheim, Roche, AstraZenca, MSD, BMS

E^3 1531-2
Treatment pathways in advanced stage lung cancer: thoracic oncologist
N. Girard; Paris/FR
(nicolas.Girard2@curie.fr)

Learning Objectives:
1. To understand the treatment strategies for advanced non-small-cell lung carcinoma (NSCLC).
2. To approach the clinical endpoints for the decision making.
3. To understand how to approach "oligo", progressive, metastatic, and residual disease.
Author Disclosures:
Nicolas Girard: Advisory Board: AZ, BMS, MSD, Roche, Pfizer, Novartis, Sanofi, Amgen, Ipsen, Janssen; Research Grant/Support: AZ, MSD, Janssen

E^3 1531-3
Diagnosis, staging, and restaging of lung cancer after immunotherapy
H. Prosch; Vienna/AT
(helmut.prosch@meduniwien.ac.at)

Learning Objectives:
1. To understand the basic principles behind immunotherapies.
2. To become familiar with the treatment responses in immunotherapies.
3. To appreciate the CT manifestations of immune-related adverse events.
Author Disclosures:
Helmut Prosch: Advisory Board: Boehringer Ingelheim, Roche, AstraZeneca, MSD, BMS, Takeda

E^3 1531-4
Radiological treatment of lung cancer: interventional oncology
C. A. Ridge; Dublin/IE
(caroleridge@hotmail.com)

Learning Objectives:
1. To describe the different radiological locoregional treatments for primary and secondary lung tumours.
2. To list the advantages and disadvantages of different techniques.
3. To discuss their role in the multidisciplinary management of patients with pulmonary malignancies.

E³ 1531-5
Multidisciplinary tumour board: case-based panel discussion
H. Prosch; Vienna/AT
(helmut.prosch@meduniwien.ac.at)
M. Ali Reza Hoda; Vienna/AT
J. Widder; Vienna/AT
(joachim.widder@meduniwien.ac.at)
T. Füreder; Vienna/AT
Author Disclosures:
Helmut Prosch: Advisory Board: Boehringer Ingelheim, Roche, AstraZeneca, MSD, BMS, Janssen, Sanofi
Thorsten Füreder: Advisory Board: Merck Sharp & Dohme; Roche; Pfizer; Boehringer Ingelheim; Sanofi; Accord; Merck KGaA; Amgen and Bristol Myers Squibb; Janssen, Takeda; Research Grant/Support: Merck Sharp & Dohme; Merck KGaA

14:00-15:30 **Room C**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1521a

Cross-sectional imaging of bone metastases

E³ 1521a-1
Is it a bone metastasis (incidental lesions)?
S. Weckbach; Heidelberg/DE

Learning Objectives:
1. To illustrate the imaging appearance of bone metastases.
2. To review the imaging protocols for the evaluation of bone metastases.
3. To illustrate how to differentiate between metastases and other focal bone lesions.
4. To illustrate the pitfalls and limitations of imaging in assessment of metastatic bone disease.

E³ 1521a-2
Dedicated whole-body staging for bone metastases
G. Petralia; Milan/IT
(giuseppe.petralia@ieo.it)

Learning Objectives:
1. To review current image acquisition and interpretation for whole-body MRI.
2. To illustrate the clinical applications for whole-body MRI in assessment of metastatic bone disease.
3. To illustrate the potential and limitations of whole-body MRI in assessment of metastatic bone disease.
Author Disclosures:
Giuseppe Petralia: Advisory Board: Lucida Medical; Speaker: Siemens Healthineers, Guerbet

14:00-15:30 **Room E2**

Special Focus Session

SF 15

Strategy for primary diagnosis of prostate cancer

SF 15-1
Chairperson's introduction
B. Hamm; Berlin/DE

SF 15-2
Unmet clinical needs in prostate cancer
H. Van der Poel; Amsterdam/NL
(h.vd.poel@nki.nl)

Learning Objectives:
1. To understand how to select men for early diagnosis strategies for prostate cancer.
2. To learn about accurate prebiopsy imaging of suspect lesions in the prostate.
3. To become familiar with the role of PSMApet in early prostate cancer diagnosis.
4. To become familiar with the role of fusion biopsies in prostate cancer detection.
Author Disclosures:
Henk van der Poel: Research Grant/Support: Astellas, Astra-Zeneca, Bayer, Intuitive, Ipsen, On-target, Storz

SF 15-3
The new role of ultrasound
J.-M. Correas; Paris/FR

Learning Objectives:
1. To understand the limited intrinsic value of conventional B-mode and colour Doppler imaging for the diagnosis of prostate cancer.
2. To learn how to improve the diagnostic capabilities of conventional ultrasound using shear-wave elastography and contrast-enhanced US.
3. To be able to combine MRI information with US information using several types of fusion techniques.
4. To learn how to design a biopsy protocol based on the identification of multiple targets using combined MRI and US data.
5. To be able to extend the use of fusion imaging for both transrectal and transperineal biopsies.
Author Disclosures:
Jean-Michel Correas: Speaker: SuperSonic Imagine, Hologic, Canon , Siemens Healthinners, FujiFilm

SF 15-4
Current and future role of multiparametric MRI (mpMRI)
H.-P. Schlemmer; Heidelberg/DE
(h.schlemmer@dkfz.de)

Learning Objectives:
1. To learn how to perform, interpret, and communicate multiparametric MRI of the prostate in accordance with international guidelines.
2. To understand the role of mpMRI for image-guided biopsy and treatment decision making.
3. To become familiar with the current developments of artificial intelligence for improvement of mpMRI within the clinical context.
Author Disclosures:
Heinz-Peter Schlemmer: Advisory Board: Siemens; Speaker: Bracco, Bayer, Siemens

SF 15-5
PSMA applicability and potential developments in primary diagnosis and characterisation of prostate cancer
I. A. Burger; Zurich/CH

Learning Objectives:
1. To become familiar with the current role of PSMA PET for staging prostate cancer.
2. To understand the impact of tumour heterogeneity for cancer detection and the potential added value of PSMA for disease detection.
3. To learn about potential future targets for prostate cancer PET.
Author Disclosures:
Irene A. Burger: Advisory Board: GE-Healthcare, AAA (Novartis), Merck; Research Grant/Support: GE-Healthcare, Bayer; Speaker: GE-Healthcare, Bayer, Astellas, Janssen

Panel discussion: From turf battles by evidence to joint patient care

14:00-15:30 **Room F1**

State of the Art Symposium

SA 15

Immunotherapy for cancer: do patients need targeted imaging?

SA 15-1
Chairperson's introduction
C. Dromain; Lausanne/CH
(Clarisse.Dromain@chuv.ch)

SA 15-2
Immunotherapy: an oncologist's view
D. De Ruysscher; Maastricht/NL
(dirk.deruysscher@maastro.nl)

Learning Objectives:
1. To understand the clinical need for immunotherapies.
2. To summarise the different types and mechanisms of action of immunotherapy.
3. To describe the mechanisms for response and resistance.
Author Disclosures:
Dirk de Ruysscher: Advisory Board: All are institutional financial interests Advisory board: Bristol-Myers Squibb, Celgene, Merck/Pfizer, Roche/Genentech, AstraZeneca, MSD, Seattle genetics; Grant recepient: All are institutional financial interests Research grants: Boehringer Ingelheim, Bristol-Myers Squibb, AstraZeneca, Philips, Olink; Research Grant/Support: All are institutional financial interests Research grants: Boehringer Ingelheim, Bristol-Myers Squibb, AstraZeneca, Philips, Olink

SA 15-3
Standard imaging: limitations in assessing immunotherapy?
C. Dromain; Lausanne/CH
(Clarisse.Dromain@chuv.ch)

Learning Objectives:
1. To summarise the different patterns of disease response to immunotherapy.
2. To describe the current response criteria for assessing immunotherapy.
3. To discuss the strengths and limitations of standard imaging for assessing immunotherapy.

SA 15-4
Molecular and hybrid imaging: what should we target?
E. Lopci; Rozzano/IT

Learning Objectives:
1. To list the different possible targets for molecular imaging of immunotherapy.
2. To discuss the strengths and limitations of each technique.
3. To consider how targeted imaging may assist patient care.
Author Disclosures:
Egesta Lopci: Author: Springer; Research Grant/Support: Fondazione AIRC; Italian Ministry of Heath; Speaker: ESMIT; MI&T congressi

SA 15-5
Predicting response to cancer immunotherapy using radiomics and artificial intelligence
S. Trebeschi; Amsterdam/NL
(s.trebeschi@nki.nl)

Learning Objectives:
1. To describe the key concepts in radiomics and artificial intelligence.
2. To understand how radiomics and artificial intelligence may contribute to response assessment.
3. To consider how radiomics and artificial intelligence may improve patient risk stratification.

Panel discussion: Is targeted imaging and artificial intelligence the way forward to personalising cancer care with immunotherapy?

14:00-15:30 **Room G**

E³ - Advanced Courses: Liver, Bile Ducts and Pancreas Imaging

E³ 1520

Staging pancreatic adenocarcinoma: a multidisciplinary approach

E³ 1520-1
Chairperson's introduction
G. Zamboni; Verona/IT
(gzamboni@hotmail.com)

Learning Objectives:
1. To discuss how structured reporting can help generate comprehensive and concise radiologic reports to help define operability or the need for chemotherapy.
2. To discuss treatment protocols with chemotherapy and immunotherapy regimens for pancreatic adenocarcinoma.
3. To discuss the benefits and limitations of imaging assessment in the postoperative and post-chemotherapy setting.

E³ 1520-2
Resection or not: what the surgeon expects from the radiologist
E. Rangelova; Gothenburg/SE
(elena.rangelova@gu.se)

Learning Objectives:
1. To provide a structured report on tumour staging and local tumour extension according to the most common definitions of resectability (NCCN, ISGPS).
2. To discriminate and critically appraise the difference in tumour appearance when re-evaluating the imaging after neoadjuvant therapy.
3. To reflect on anatomical landmarks that may influence the surgeon's decision on resectability.

E³ 1520-3
Clinical practice guidelines for patient management: the oncologist's perspective
A. Cervantes; Valencia/ES
(andres.cervantes@uv.es)

Learning Objectives:
1. To select patients for preoperative chemotherapy or chemoradiation according to imaging-defined findings.
2. To select patients for postoperative chemotherapy according to the pathology report.
3. To define the prognostic factors in localised/locally-advanced pancreatic tumours for proper risk stratification.

E³ 1520-4
Preoperative and chemotherapy response assessment
G. Zamboni; Verona/IT
(gzamboni@hotmail.com)

Learning Objectives:
1. To discuss the role of the different imaging modalities in the preoperative and in the post-treatment assessment.
2. To define imaging protocols to best address the changing clinical needs.
3. To reflect on the limitations and strengths of state-of-the-art imaging in the preoperative and post-treatment evaluation of pancreatic adenocarcinoma.

E³ 1520-5
Multidisciplinary tumour board: case-based panel discussion
G. Zamboni; Verona/IT
(gzamboni@hotmail.com)

14:00-15:30 **Room K**

E³ - Advanced Courses: Gynaecology/Genitourinary Imaging

E³ 1532

Bladder cancer: a multidisciplinary approach

E³ 1532-1
Chairperson's introduction
V. Panebianco; Rome/IT
(valeria.panebianco@uniroma1.it)

Learning Objectives:
1. To present a comprehensive clinical overview on bladder cancer management from research to the operating room, focusing on unanswered questions.
2. To learn about the recent treatment options for muscle-invasive bladder cancer (including immunotherapy).
3. To discuss the role of MRI in bladder cancer staging and response assessment and its influence on the decision making of precision therapy.
4. To exchange expertise in an MDT case-based dialogue.

E³ 1532-2
Management of bladder cancer: from bench to bedside
S. F. Shariat; Vienna/AT

Learning Objectives:
1. To address unmet clinical needs in non-muscle invasive and muscle-invasive bladder cancer.
2. To discuss intravesical tumour detection.
3. To review the imaging and follow up during neoadjuvant therapy.

E³ 1532-3
New frontiers for advanced bladder cancer care
A. Necchi; Milan/IT
(necchi.andrea@hsr.it)

Learning Objectives:
1. To identify the current therapeutic possibilities offered to patients with a diagnosis of advanced bladder cancer.
2. To describe the landscape of therapeutic options currently available in patients with a disease relapse following an immune-checkpoint inhibitor treatment.
3. To identify the proper timing for tumour or next-generation sequencing or ctDNA assessment.

E³ 1532-4
Emerging role of MRI
H. A. Vargas; New York, NY/US

Learning Objectives:
1. To review the indications and clinical scenarios where bladder MRI could provide the most impact on patient care.
2. To discuss technical aspects of bladder MRI acquisition and the need for a standardised approach.
3. To introduce VI-RADS as a tool for standardised MRI reporting and discuss up-to-date literature supporting its use.

E³ 1532-5
Multidisciplinary tumour board: case-based panel discussion
V. Panebianco; Rome/IT
(valeria.panebianco@uniroma1.it)

14:30-15:30 **Tech Gate Auditorium**

Patients in Focus

IF 15

Be accepted launch

Moderator
M. H. Fuchsjäger; Graz/AT

IF 15-2
Einführung durch den ESR Vorsitzenden
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)

Learning Objectives:
1. Vorstellung des von der ESR geförderten Projekts "Be accepted" als konkretes Beispiel dafür, wie die neue Positionierung der Radiolog/innen in der medizinischen Welt unterstützt werden kann.
2. Umsetzungsmöglichkeiten für Radiolog/innen in der Rolle als Gatekeeper und Pionier/innen, um Patient/innen zu erreichen und zu unterstützen.
3. Die daraus resultierende Verbesserung der Arbeitsabläufe und Stimmung innerhalb einer radiologischen Abteilung.

IF 15-3
Wie ich vom Himmel fiel
A. Lombard Puntschart; Vienna/AT
(annemarie@venusfrequency.com)

Learning Objectives:
1. Die Geschichte von Annemarie Puntschart, wie sie buchstäblich vom Himmel fiel.
2. Veranschaulichung der Tatsache, dass es sich bei Prognosen um Annahmen handelt, sowie Erläuterung der Möglichkeiten, die sich aus der Kombination von Medizin und willensstarken, positiv eingestellten und gut informierten Patient/innen ergeben.
3. Wie sich das Leben von Annemarie Puntschart verändert hat und die wichtige Nachricht, die sie weitergeben möchte.

IF 15-4
Entspannungseinheit
A. Lombard Puntschart; Vienna/AT
(annemarie@venusfrequency.com)

Learning Objectives:
1. Meditation und Umlenkung des Fokus vom Stress zurück auf sich selbst.
2. Moment der Entspannung.
3. Erleben der großen Wirkung, die mit wenig Aufwand erzielt werden kann.

IF 15-5
Launch von "Be accepted"
C. Justich; Vienna/AT
(cjustich@me.com)
M. H. Fuchsjäger; Graz/AT
R. Bartsch; Vienna/AT
F. Fitzal; Vienna/AT
A. Schratter-Sehn; Vienna/AT
(Annemarie.schratter@gmail.com)
M. Kainz; Vienna/AT
J. Coy; Monheim/DE

Learning Objectives:
1. Die Erfolgsgeschichte zwischen einem Radiologen und einem Patienten.
2. Bedeutung der Rolle der Radiolog/innen als Gatekeeper, die die Patient/innen im ersten Schockzustand auffangen und auf die nächsten Schritte vorbereiten.
3. Unterstützung beim Aufbau des Ärzt/innen-Teams des Patienten oder der Patientin.
4. Das Ergebnis einer sehr erfolgreichen Zusammenarbeit zwischen einem Radiologen und einem Patienten sowie die Möglichkeiten und Vorgehensweisen zum Erhalt einer großen Anzahl von medizinischen Behandlungen.

Author Disclosures:
Johannes Coy: Patent Holder: Patents for the diagnostic and therapeutic use of TKTL1; Share Holder: Zyagnum AG, TAVARGENIX GmbH, benfovir AG

16:00-17:00 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 16Y

Meet the professors: part 4

OF 16Y-1
Chairperson's introduction
M. Pecoraro; Rome/IT

Learning Objectives:
Distinguished professors of radiology are invited, together with their younger colleagues, to share their experience, their vision, and give advice and guidance to the younger generation of radiologists.

OF 16Y-2
Boosting your career: more than one way to skin a rabbit!
S. Robinson; Vienna/AT
(s.robinson@dzu.at)

OF 16Y-3
Diversity in a bilingual environment: from medical studies to clinical commitment in radiology
H. C. Thoeny; Fribourg/CH
(Harriet.thoeny@h-fr.ch)
L. Widmer; Fribourg/CH
J. Vidal; Fribourg/CH
(Julian.Vidal@h-fr.ch)
P. Karampa; Fribourg/CH
J. Di Vincenzo; Fribourg/CH
Author Disclosures:
Harriet C. Thoeny: Advisory Board: Guerbet SA; Speaker: Guerbet

Discussion

16:00-17:00 **Open Forum #4 (ESR)**

Joint Session of ESR and EIBIR

ESR/EIBIR 16

Big data and artificial intelligence in cancer imaging

ESR/EIBIR 16-1
Chairperson's introduction
M. Dewey; Berlin/DE
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

ESR/EIBIR 16-2
Main aspects on data repositories in cancer imaging
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)

Learning Objectives:
1. To learn how medical imaging and data repositories should be constructed.
2. To appreciate how to fill imaging and data repositories for observational studies.
3. To understand the role of federated repositories and federated learning in medical imaging.

ESR/EIBIR 16-3
Building and validating artificial intelligence workflows in cancer imaging
K. Lekadir; Barcelona/ES
(karim.lekadir@ub.edu)

Learning Objectives:
1. To learn about the different methods for building and validating artificial intelligence workflows in cancer imaging.
2. To appreciate how federated big data repositories can enhance future artificial intelligence applications in cancer imaging.
3. To understand how to increase trust in future artificial intelligence solutions in cancer imaging.

ESR/EIBIR 16-4
EIBIR activities and upcoming funding opportunities
P. Gordebeke; Vienna/AT
(pgordebeke@eibir.org)

Learning Objectives:
1. To learn about EIBIR activities and support services.
2. To understand how EIBIR can increase funding success.
3. To become familiar with European research funding opportunities, in particular, Horizon Europe.

Panel discussion: Can causality be inferred from medical images?

16:00-17:00 **Room 31/32**

Open Forum Session

Organised by the EFRS

OF 16R

Top tips in ultrasound 4: female pelvis

Moderator
G. Harrison; London/UK

Learning Objectives:
1. To describe best practice, tips, and tricks for trans-abdominal ultrasound examinations of the female pelvis.
2. To demonstrate and apply best practice, tips, and tricks for trans-abdominal ultrasound examinations of the female pelvis.

OF 16R-2
Trans-abdominal ultrasound: presentation, live scanning demonstration, and questions and answers
R. Sicklen; London/UK

16:00-17:00 **Room B**

Refresher Course: Oncologic Imaging

RC 1616

Pros and Cons: PET is the best method for whole body metastatic imaging

RC 1616-1
Chairperson's introduction
M. E. Mayerhöfer; Vienna/AT
Author Disclosures:
Marius E. Mayerhöfer: Speaker: Siemens, GE, BMS

RC 1616-2
PRO
S. Fanti; Bologna/IT
(stefano.fanti@aosp.bo.it)

Learning Objectives:
This house believes that PET is the best method for whole body metastatic imaging.
Author Disclosures:
Stefano Fanti: Advisory Board: many

RC 1616-3
CON
A. R. Padhani; London/UK
(anwar.padhani@talk21.com)

Learning Objectives:
This house believes that PET is NOT the best method for whole body metastatic imaging.
Author Disclosures:
Anwar R. Padhani: Advisory Board: Siemens Healthineers

Panel discussion: How can we choose the best option for our patient?

16:00-17:00 **Room D**

Transatlantic Course of ESR and RSNA (Radiological Society of North America): Breast Cancer Imaging

TC 16

Interventional breast techniques

Moderators
L. Moy; New York, NY/US
R. M. Mann; Nijmegen/NL

TC 16-3
A. Digital breast tomosynthesis-guided biopsy: how to do it, indications
E. Conant; Philadelphia, PA/US
(Emily.Conant@pennmedicine.upenn.edu)

Learning Objectives:
1. To learn about the benefits and advantages of DBT-guided breast biopsy compared to other methods.
2. To understand the basic principles of performing DBT-guided biopsy with step-by-step details.
3. To become familiar with tips and tricks for troubleshooting in difficult cases.
Author Disclosures:
Emily Conant: Advisory Board: iCAD, Inc., Hologic, Inc.; Grant recepient: iCAD, Inc., Hologic, Inc., OM1; Investigator: iCAD, Inc., Hologic, Inc., OM1

TC 16-4
B. Smart Clips and other devices for lesion localisation
F. Kilburn-Toppin; Cambridge/UK

Learning Objectives:
1. To consider the indications for radiologically-guided lesion localisation.
2. To compare and contrast the strengths and limitations of different localisation devices.
3. To reflect on the most appropriate methods for lesion localisation in particular cases.

TC 16-5
C. Minimally invasive treatment of breast cancer: a paradigm change
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)

Learning Objectives:
1. To learn about techniques for minimally invasive treatment of breast cancer.
2. To become familiar with ist use in clinical practice.
3. To appreciate the paradigm change involved.

16:00-17:00 **Room G**

Refresher Course: Physics in Medical Imaging

RC 1613

The multidisciplinary management of oncology patients during the evaluation of treatment response

RC 1613-1
Chairperson's introduction
C. H. McCollough; Rochester, MN/US
(mccollough.cynthia@mayo.edu)
Author Disclosures:
Cynthia H. McCollough: Advisory Board: Siemens; Board Member: ISCT; Equipment Support Recepient: Siemens; Research Grant/Support: Siemens

RC 1613-2
Perspectives of personalised modern oncology: examples of new drug approaches and clinical trial development
J. Haanen; Amsterdam/NL

Learning Objectives:
1. To understand the steps that new drug approaches have to go through before becoming a standard of care (SOC).
2. To learn about the hurdles that need to be overcome (pharma or academia).
3. To appreciate the complexity of drug and trial developments and the costs involved.
Author Disclosures:
John Haanen: Grant recepient: Dutch Cancer Society grant; Investigator: TIL trial; Research Grant/Support: Dutch Cancer Society

RC 1613-3
Staging and follow-up of oncologic patients: special needs of appropriateness in radiological imaging
J. Podgorska; Warsaw/PL
(jpodgo@gmail.com)

Learning Objectives:
1. To understand the need for radiation dose-lowering techniques in diagnostic imaging.
2. To learn that the quality of imaging should be adjusted to the imaging purpose.
3. To understand that the decline in image quality associated with the use of low-dose techniques should not be associated with a decline in diagnostic performance.

RC 1613-4
Staging and follow-up of oncologic patients: special needs of optimisation in radiological imaging
M. Brambilla; Novara/IT
(marco.brambilla@maggioreosp.novara.it)

Learning Objectives:
1. To understand the need from customising imaging protocols in patients submitted to recurrent imaging.
2. To learn how to optimise CT and PET/CT in oncology patients during the evaluation of treatment response.
3. To learn about the average level of cumulative effective dose due to medical imaging accrued by those patients.

Panel discussion: Oncology patients in the radiology department: who and how should we coordinate a multidisciplinary team in case of oncologic patients that take part in clinical trials and/or drug programmes?

16:00-17:00 **Room Z**

EuroSafe Imaging Session

Organised by EuroSafe Imaging

EU 16

European Commission tender: European co-ordinated action on improving justification of computed tomography

Moderator
J. Sosna; Jerusalem/IL

EU 16-2
Chairperson's introduction
A. Karoussou-Schreiner; Luxembourg/LU
Author Disclosures:
Alexandra Karoussou-Schreiner: Author: Alexandra Karoussou-Schreiner

EU 16-3
EU-JUST-CT project: importance and aims – ESR's view
B. Brkljačić; Zagreb/HR
(boris@brkljacic.com)

Learning Objectives:
1. To appreciate the importance and legal aspects of justification of imaging procedures.
2. To present the specific objectives of the project.
3. To present the organisational chart and work packages.

EU 16-4
EU-JUST-CT: importance and aims – European Commission's view
G. Simeonov; Luxembourg/LU
(georgi.simeonov@ec.europa.eu)

Learning Objectives:
1. To learn about the European Commission SAMIRA initiative and its quality and safety pillar.
2. To appreciate the role of clinical audit and justification in the SAMIRA context.
3. To understand the objectives of the EC-JUST-CT project in the SAMIRA quality and safety context.

EU 16-5
EU-JUST-CT: current evidence base and EU justification processes
S. J. Foley; Dublin/IE
(shane.foley@ucd.ie)

Learning Objectives:
1. To summarise the literature about major audits on justification of CT examinations.
2. To present the design and implementation of a survey among EU national competent authorities and professional societies on CT justification processes.
3. To review the key results of the survey.

Panel discussion: How many imaging procedures in Europe are not appropriate and how can we improve the figures?

16:00-17:30 **Room A**

E³ - Young ECR Programme: Radiology Trainees Forum (RTF)

RTF Quiz

Radiological chariots of fire: the journey through sports and pain

Quiz Masters
M. Francone; Milan/IT
C. Loewe; Vienna/AT

Learning Objectives:
Come and take part in this special quiz and support a noble cause! Every participant counts as the ESR will donate 1€ to Doctors Without Borders for each correct answer you give! Each case will give you an opportunity to show your knowledge, and the ESR will make sure that it gets rewarded by donating to the great Doctors Without Borders.

16:00-17:30 **Room C**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1621

Imaging of the retroperitoneum

E³ 1621-1
Retroperitoneal lesions
S. Ramanathan; Doha/QA
(drrmsubbu@gmail.com)

Learning Objectives:
1. To illustrate the spectrum of primary retroperitoneal tumours and non-neoplastic disease.
2. To explain the key points in the differential diagnosis.
3. To learn how to avoid interpretation pitfalls.

E³ 1621-2
Subperitoneal, perirectal and deep pelvic lesions
M. Secil; Izmir/TR
(mustafa.secil@deu.edu.tr)

Learning Objectives:
1. To illustrate the spectrum of benign and malignant perirectal and deep pelvic lesions.
2. To discuss the imaging features of these lesions.
3. To understand how to narrow the differential diagnosis.

16:00-17:30 **Room K**

E³ - Advanced Courses: Gynaecology/Genitourinary Imaging

E³ 1632

Ovarian cancer: a multidisciplinary approach

E³ 1632-1
Chairperson's introduction
E. Sala; Cambridge/UK

Learning Objectives:
1. To understand the critical clinical questions and treatment options in ovarian cancer.
2. To review the role of imaging in the evaluation of peritoneal carcinomatosis.
3. To recognise the role of imaging in treatment selection and surgical planning in patients with ovarian cancer.
4. To discuss the role of quantitative imaging in dynamic tracking of tumour heterogeneity and predicting outcome in ovarian cancer.

E³ 1632-2
Unanswered questions in ovarian cancer: the oncologist
J. D. Brenton; Cambridge/UK

Learning Objectives:
1. To understand why high-grade serous ovarian carcinoma is so genomically and immunologically heterogeneous.
2. To describe the importance of homologous recombination deficiency and BRCA1 and BRCA2 mutation in predicting treatment response.
3. To debate the utility of CA-125, circulating tumour DNA, and pathological response compared to RECIST response measurements.

E³ 1632-3
Imaging of peritoneal carcinomatosis
S. Nougaret; Montpellier/FR

Learning Objectives:
1. To review cross-sectional imaging modalities' performance for detection and follow up of peritoneal carcinomatosis.
2. To discuss the important CT and MRI parameters that need to be assessed at baseline in peritoneal carcinomatosis in ovarian cancer.
3. To discuss how structured imaging reporting can guide patient management in ovarian cancer.

E³ 1632-4
Radiomics for assessing tumour heterogeneity and predicting outcome
R. Woitek; Cambridge/UK

Learning Objectives:
1. To understand how disease heterogeneity is captured, quantified, and followed on imaging.
2. To learn how novel techniques centred around imaging can increase our molecular understanding of tumour heterogeneity.
3. To learn about the role of radiomics in the multiomics-based prediction of response and prognosis for patients with ovarian cancer.
Author Disclosures:
Ramona Woitek: Speaker: GE Healthcare

E³ 1632-5
Multidisciplinary tumour board: case-based panel discussion
E. Sala; Cambridge/UK

16:00-17:30 **Room M 4**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1619

Building bridges between research and clinics in AI: a multidisciplinary approach

E³ 1619-1
Chairperson's introduction
M. Maas; Amsterdam/NL
Z. Elkarghali; Amsterdam/NL
(z.elkarghali@nki.nl)

Learning Objectives:
1. To learn about the value of non-medical technical staff (researchers/computer scientists) in your radiology department.
2. To know examples of successfully-implemented AI algorithms in the routine clinical workflow and how they were embraced.
3. To understand the pearls of wisdom and pitfalls in multidisciplinary collaborations between medics and non-medical practitioners.
4. To know the recipe for success in relations between researchers and radiologists.

E³ 1619-2
Rising role in the Dutch clinical workflow and research: the clinical technologist's perspective
J. van Zandwijk; Enschede/NL
(j.k.vanzandwijk@utwente.nl)

E³ 1619-3
Clinical implementation of AI algorithm: opportunities and challenges, experience from a radiology department
L. Topff; Amsterdam/NL
(laurens@topff.be)

E³ 1619-4
Multidisciplinary collaboration in radiomics research
R. Perez-Lopez; Barcelona/ES
(rperez@vhio.net)
Author Disclosures:
Raquel Perez-Lopez: Employee: Vall d'Hebron Institute of Oncology and Vall d'Hebron University Hospital; Grant recepient: Prostate Cancer Foundation, CRIS Foundation, FERO Foundation, LaMarató Foundation, La Caixa Foundation, Carlos III Instituto de Investigación, European Commission H2020 Program.; Research Grant/Support: AstraZeneca, Roche Pharma

E³ 1619-5
Case-based panel discussions
J. van Zandwijk; Enschede/NL
(j.k.vanzandwijk@utwente.nl)
L. Topff; Amsterdam/NL
(laurens@topff.be)
R. Perez-Lopez; Barcelona/ES
(rperez@vhio.net)
S. Trebeschi; Amsterdam/NL
(s.trebeschi@nki.nl)
Author Disclosures:
Raquel Perez-Lopez: Advisory Board: Roche Pharma; Research Grant/Support: AstraZeneca, Roche Pharma

16:00-17:30 **Room O**

EFRS Workshop

EFRS WS

Building our professional evidence-base

EFRS WS-1
Chairperson's introduction: Why it is essential that we all engage with research
J. McNulty; Dublin/IE
(jonathan.mcnulty@ucd.ie)
Author Disclosures:
Jonathan McNulty: Other: Editor in Chief, Radiography Journal (Elsevier / SCoR)

EFRS WS-2
Publishing in a peer-review journal: taking your first steps
S. D. Mørup; Odense/DK
(sdmo@ucl.dk)

Learning Objectives:
1. To summarise the key factors that can lead to your first published article.
2. To review the considerations for selecting the most appropriate journal for your work.
3. To discuss how you can avoid making common mistakes with your article.

EFRS WS-3
Reviewing for a peer-review journal: getting started and top tips
N. Courtier; Cardiff/UK

Learning Objectives:
1. To discuss the purpose of peer review and the steps within the peer review process.
2. To highlight key aspects of a quality review and how these ensure high quality publications and support authors.
3. To consider why and how to get involved as a reviewer.
Author Disclosures:
Nick Courtier: Board Member: Editorial Board Member of Radiography journal; Other: Associate Editor of Radiography journal

EFRS WS-4
Engaging with peer-review journals through social media
R. Reeve; Portsmouth/UK

Learning Objectives:
1. To explore the role of social media in research dissemination for authors and for journals.
2. To consider approaches to increasing the impact of your research using social media.
3. To review the key considerations in how best to make your research accessible to practitioners using social media.

Open discussion

16:00-17:30 **Room X**

ESOR Session

ESOR

Education in research

Moderators
R. G. H. Beets-Tan; Amsterdam/NL
V. Vilgrain; Clichy/FR

ESOR-2
Introduction
R. G. H. Beets-Tan; Amsterdam/NL

ESOR-3
ESOR in action 2022
V. Vilgrain; Clichy/FR
(valerie.vilgrain@aphp.fr)

Learning Objectives:
1. To become familiar with ESOR.
2. To learn about ESOR activities in 2022.
3. To understand the new topics of the ESOR Educational Programme.

ESOR-4
Getting involved in clinical trials: it is never too early
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)

Learning Objectives:
1. To understand the rationale for clinical trials.
2. To learn about the different types of clinical trials.
3. To appreciate the role of radiologists in clinical trials.

Author Disclosures:
Marie-Pierre Revel: Equipment Support Recepient: Mevis, Coreline, Aidence; Investigator: GLEAMER; Speaker: GE Healthcare, Boerhinger Ingelheim, chiesi, Bracco

ESOR-5
The importance of networking in research
C. Catalano; Rome/IT
(Carlo.Catalano@uniroma1.it)

Learning Objectives:
1. To stress the importance of high-quality studies and having a good publication network to have a successful career.
2. To point out that science is collaborative and that few scientific advances are made in isolation.
3. To demonstrate that the exchange of thoughts with peers allows learning more about views on different subjects.
4. To understand that having friendly relationships with other researchers can open doors to successful job interviews or fruitful collaborations.
5. To inform about the COST project that the EU has had established for many years to develop networking and interdisciplinary research in Europe and beyond.

ESOR-6
My experience: Bracco research fellowship
Z. Snoj; Ljubljana/SI
(ziga.snoj@gmail.com)

Learning Objectives:
1. To appreciate the opportunity of a research fellowship.
2. To become familiar with research fellowship goals.
3. To gain insight into the fellowship course based on the scholar's experience.

ESOR-7
My experience: Nicholas Gourtsoyiannis teaching fellowship
F. Giganti; London/UK
(giganti.fra@gmail.com)

Learning Objectives:
1. To have a detailed overview of the ESOR Nicholas Gourtsoyiannis teaching fellowship.
2. To see and discuss the results from the 2021 teaching fellowships.
3. To understand all the necessary requirements for submission.
4. To receive a list of tips and recommendations for a successful application.

Author Disclosures:
Francesco Giganti: Grant recepient: I am the recipient of the 2021 Nicholas Gourtsoyiannis teaching fellowship.

Panel discussion

Saturday, July 16

08:00-09:00 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 17Y

Career paths: subspecialisation (part 1)

OF 17Y-1
Chairperson's introduction
A. H. Karantanas; Iraklion/GR
(akarantanas@gmail.com)

Learning Objectives:
Part of a series of sessions dedicated to exploring different career paths in radiology. The session's goal is to highlight the beauty of subspecialisation in radiology from a multidisciplinary perspective with tandem talks from experienced subspecialised radiologists and their clinical partners.

OF 17Y-2
Neuroradiology (ESNR)
M. Vernooij; Rotterdam/NL
H. Seelaar; Rotterdam/NL

OF 17Y-3
Paediatric radiology (ESPR)
M. Raissaki; Iraklion/GR
(mraissaki@yahoo.gr)
S. Ilia; Iraklion/GR
(stavroula.ilia@uoc.gr)
Author Disclosures:
Maria Raissaki: Other: Organiser of ECPR, EC chair, child abuse ESPR co-chair

OF 17Y-4
Thoracic imaging (ESTI)
A. Snoeckx; Antwerp/BE
(Annemiek.Snoeckx@uza.be)
J. P. van Meerbeeck; Edegem/BE
Author Disclosures:
Annemiek Snoeckx: Advisory Board: Agfa; Speaker: Samsung

Discussion

08:00-09:00 **Room B**

Refresher Course: Cardiac

RC 1703

The crucial role of the radiologist at the heart of the multidisciplinary cardiac team

RC 1703-1
Chairperson's introduction
R. Salgado; Antwerp/BE

RC 1703-2
Cardiac CT and MRI in the cardiac team: the role of the radiologist according to the guidelines
M. Gutberlet; Leipzig/DE
(matthias.gutberlet@helios-kliniken.de)

Learning Objectives:
1. To provide an update on the recently published guidelines in which cardiac MRI and cardiac CT play an important role.
2. To define the role of the radiologist within the heart team according to the recent guidelines.
3. To describe possible conflicts within the interdisciplinary heart team and potential solutions.
Author Disclosures:
Matthias Gutberlet: Advisory Board: Bayer Healthcare; Board Member: ESCR; Employee: HELIOS

RC 1703-3
The value of the radiologist in non-surgical aortic and mitral valve intervention
J.-N. Dacher; Rouen/FR
(jndacher@gmail.com)

Learning Objectives:
1. To become familiar with the technical requirements of cardiac CT in preoperative assessment of transcatheter aortic (TAVI) or mitral (TMVI) valve replacement.
2. To learn how to structure a radiology report before TAVI/TMVI in the context of a heart team approach.
3. To understand the complementary roles of echocardiography, cardiac CT, and MRI in planning nonsurgical aortic or mitral valve intervention.

RC 1703-4
The vital role of the radiologist in the congenital cardiac team
A. J. B. S. Madureira; Porto/PT

Learning Objectives:
1. To understand what makes a good team.
2. To appreciate who is in the team and how to define the role of the radiologist in the congenital cardiac team.
3. To understand how to build the team and what success looks like.

Panel Discussion: How do radiologists become, and ensure we remain, a crucial part of these teams in the future?

08:00-09:00 **Room C**

Refresher Course: Physics in Medical Imaging

RC 1713

Pros and Cons: The clinical benefits of MRI-Linac systems are worth the headaches

RC 1713-1
Chairperson's introduction
I. Seimenis; Athens/GR

RC 1713-2
PRO
B. Raaymakers; Amsterdam/NL
(braaymak@umcutrecht.nl)

Learning Objectives:
This house believes that the clinical benefits of MRI-Linac systems are worth the headaches.
Author Disclosures:
Bas Raaymakers: Grant recepient: Receiving cash and in kind contributions for grants from Elekta; Research Grant/Support: Receiving cash and in kind contributions from Elekta

RC 1713-3
CON
C. Fiorino; Milan/IT
(fiorino.claudio@hsr.it)

Learning Objectives:
This house believes that the clinical benefits of MRI-Linac systems are NOT worth the headaches.

Panel discussion: Image-guided radiotherapy: when and how should we visualise treatment response?

08:00-09:00 **Room F1**

Refresher Course: Musculoskeletal

RC 1710

Ultrasound in musculoskeletal radiology

RC 1710-1
Chairperson's introduction
E. E. Drakonaki; Iraklion/GR
(drakonaki@yahoo.gr)

RC 1710-2
High-frequency and ultra-high frequency ultrasound
L. M. Sconfienza; Milan/IT
(io@lucasconfienza.it)

Learning Objectives:
1. To discuss the current advances in state-of-the-art high-frequency and ultra-high frequency ultrasound.
2. To discuss the main indications and clinical applications.
3. To demonstrate the ultrasound semiology of pathologic conditions.
Author Disclosures:
Luca M. Sconfienza: Speaker: Esaote SpA, Abiogen, Samsung Medison, Pfizer, Novartis, MSD, Merck Serono, Jannsen-Cilag, Fidia Pharma Group; Other: Non-financial support by Bracco Imaging Italia SrL

RC 1710-3
MSK elastography
Z. Snoj; Ljubljana/SI
(ziga.snoj@gmail.com)

Learning Objectives:
1. To explain the techniques used in ultrasound elastography of the musculoskeletal system.
2. To describe ultrasound elastography findings in musculoskeletal radiology.

RC 1710-4
Interventional MSK ultrasound
E. E. Drakonaki; Iraklion/GR
(drakonaki@yahoo.gr)

Learning Objectives:
1. To discuss the indications for ultrasound-guided treatment and intervention.
2. To describe the prerequisites and technique.
3. To discuss the advantages and disadvantages of ultrasound-guided intervention compared to other imaging-guided modalities.

Panel discussion: New clinical roles for musculoskeletal ultrasound

08:00-09:00 **Room G**

Refresher Course: Emergency Imaging

RC 1717

Controversial issues in imaging COVID-19 patients in the emergency setting

RC 1717-1
Chairperson's introduction
M.-P. Revel; Paris/FR
Author Disclosures:
Marie-Pierre Revel: Speaker: GE Healthcare, Bracco, Chiesi, Boeringher-Ingelheim; Other: Expert annotation for GE Healthcare and Gleamer

RC 1717-2
Classification and scoring systems of COVID-19 imaging findings
I. Blazic; Belgrade/RS
(ivanablazic@yahoo.com)

Learning Objectives:
1. To learn about COVID-19 imaging findings scoring systems defined in the previous studies.
2. To recognise which scoring system is generally accepted by radiology communities.
3. To seek out the correlation between COVID-19 imaging scoring systems and the clinical outcome of patients.

RC 1717-3
Differential diagnosis of lung ground-glass opacities in COVID-19 pandemic
A. R. Larici; Rome/IT
(annarita.larici@unicatt.it)

Learning Objectives:
1. To learn about the differential diagnosis in patients presenting to the emergency department with ground-glass opacity on CT.
2. To become familiar with the imaging findings of COVID-19 patients in the early phase of the disease.
3. To understand when it is possible to make differential diagnosis.

RC 1717-4
Who would benefit from urgent chest imaging and which imaging strategy is the best?
L. Gorospe Sarasua; Madrid/ES
(luisgorospe@yahoo.com)

Learning Objectives:
1. To learn about the recommendations for selecting patients who require urgent imaging.
2. To become familiar with the adequate indications for performing CT with IV.
3. To describe the CT findings that have an impact on management.

Panel discussion: How can we integrate imaging to orient patient management?

08:00-09:00 **Room N**

EFRS meets the Netherlands

Meets 17

Building bridges: EFRS meets the Netherlands

Presiding
F. Zarb; Msida/MT
J. Clarijs-de Jong; Delft/NL

Moderator
J. Clarijs-de Jong; Delft/NL

Meets 17-1
Introduction
F. Zarb; Msida/MT
(francis.zarb@um.edu.mt)
J. Clarijs-de Jong; Delft/NL

Meets 17-2
Surface scanning in radiotherapy
D. Washington; Tilburg/NL
(washington.d@bvi.nl)
L. Mesch; Tilburg/NL

Learning Objectives:
1. To describe the implementation process for surface scanning equipment in radiotherapy.
2. To discuss the improvements and challenges experienced following implementation of surface scanning equipment.
3. To demonstrate how feedback from users (radiographers and patients) drives adaption from industry and improves effectiveness.

Meets 17-3
Hybrid imaging: the merge between radiology and nuclear medicine
P. Liedorp; Raamsdonkveer/NL
(peter@pi-medical.nl)

Learning Objectives:
1. To consider the benefits and challenges when merging the departments of radiology and nuclear medicine in relation to hybrid imaging.
2. To provide a short summary of the history and safety issues for hybrid imaging.
3. To highlight the changing educational requirements for radiographers performing hybrid imaging examinations.

Panel discussion

08:00-09:00 **Room O**

Refresher Course: Breast

RC 1702

Neoadjuvant chemotherapy of breast cancer: image-guided treatment

RC 1702-1
Chairperson's introduction
E. Aribal; Istanbul/TR
Author Disclosures:
Erkin Aribal: Speaker: GE Healthcare

RC 1702-2
Current role and results of imaging methods to detect residual disease
T. Sella; Jerusalem/IL
(tamarse@hadassah.org.il)

Learning Objectives:
1. To understand the various patterns of response to neoadjuvant chemotherapy (NAC) and how they appear on various imaging modalities.
2. To understand the advantages and limitations of mammography, US, and MRI in evaluating residual disease following NAC.
3. To become familiar with new technologies and the evaluation of response to NAC (US elastography and CESM).

RC 1702-3
Early response assessment and potential change of treatment: what needs to be done?
C. Loo; Amsterdam/NL
(c.loo@nki.nl)

Learning Objectives:
1. To review the assessment and appearance of complete, partial, and non-response to neoadjuvant systemic therapy in breast MRI.
2. To become familiar with the influence of subtypes of breast cancer to response monitoring.
3. To understand the causes of over and underestimation of residual disease at MRI after neoadjuvant therapy.

RC 1702-4
Post-therapeutic management: is this the time to start omitting surgery?
S. Jimenez Arranz; Madrid/ES
(sarajimenezarranz@gmail.com)

Learning Objectives:
1. To choose the best imaging modalities per breast cancer subtype when selecting patients for potential biopsy and the elimination of surgery.
2. To identify the optimal method of minimal invasive biopsy, including FNA vs core cut vs VACB/VAE in the post-neoadyuvant chemotherapy.
3. To analyse if the accuracy of image-guided biopsy is comparable with the gold standard surgical treatment.
4. To list the most relevant clinical trials that are omitting surgery after neoadyuvant chemotherapy.

Panel discussion: Is it possible to team up with the oncologists to adapt treatment using imaging biomarkers?

08:00-09:00 **Room Z**

EFOMP Workshop

EF

Interventional CT and fluoroscopy: optimisation, safety, and practice

Moderators
P. Gilligan; Dublin/IE
L. Sukupova; Prague/CZ

EF-2
Chairperson's introduction
P. Gilligan; Dublin/IE

EF-3
Optimisation in interventional CT and CT fluoroscopy
J. Greffier; Nimes/FR
(joel.greffier@chu-nimes.fr)

Learning Objectives:
1. To learn about new opportunities to optimise protocols in interventional CT.
2. To understand the potential dose reductions.
3. To become familiar with how new protocols can be implemented in a practical manner.

EF-4
Occupational safety in CT fluoroscopy and interventional CT
C. Hohl; Siegen/DE
(chohl@gmx.net)

Learning Objectives:
1. To learn about new opportunities to reduce staff dose in interventional CT.
2. To understand the potential dose reductions.
3. To become familiar with how new protocols can be implemented in a practical manner.

EF-5
Safe and optimised clinical practice in interventional CT
M. Bolger; Dublin/IE
(markbolger@mater.ie)

Learning Objectives:
1. To describe the implementation of optimised protocols for the new clinical uses of interventional CT.
2. To understand the effect that this has on clinical practice.
3. To look toward future trends in this area.

Panel discussion: Is in-room interventional fluoroscopy and CT now a safer practice with patient benefits?

09:30-10:00 **Room A**

Plenary Lecture

PL 3

Plenary Lecture

Presiding
R. G. H. Beets-Tan; Amsterdam/NL

PL 3-1
Thinking differently about cancer treatment regimens
R. Bernards; Amsterdam/NL

10:30-11:30 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by the EFRS

OF 18R

Cardiac: protocols for imaging

Moderator
M. Weber Kusk; Esbjerg/DK

Learning Objectives:
1. To describe top tips for scan protocols, patient preparation, and patient aftercare for cardiac CT and MRI.
2. To discuss the key clinical findings, pathology, and common pitfalls for cardiac CT and MRI.

OF 18R-2
Cardiac CT: presentation radiographer
M. L. Dijkshoorn; Rotterdam/NL

OF 18R-3
Cardiac CT: presentation radiologist
R. P. J. Budde; Rotterdam/NL
(r.budde@erasmusmc.nl)
Author Disclosures:
Ricardo P.J. Budde: Research Grant/Support: Institutional support to Erasmus MC by Siemens and Heartflow; Speaker: Bayer

Discussion

OF 18R-5
Cardiac MRI: presentation radiographer
N. Blanken; Utrecht/NL
Author Disclosures:
Niels Blanken: Speaker: Niels Blanken

OF 18R-6
Cardiac MRI: presentation radiologist
D. Beitzke; Vienna/AT
(dietrich.beitzke@meduniwien.ac.at)
Author Disclosures:
Dietrich Beitzke: Advisory Board: GE Healthcare; Speaker: Medis Medical Imaging; GE Healthcare

Discussion

10:30-11:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 18Y

Career paths: subspecialisation (part 2)

OF 18Y-1
Chairperson's introduction
A. H. Karantanas; Iraklion/GR
(akarantanas@gmail.com)

Learning Objectives:
Part of a series of sessions dedicated to exploring different career paths in radiology. The session's goal is to highlight the beauty of subspecialisation in radiology from a multidisciplinary perspective with tandem talks from experienced subspecialised radiologists and their clinical partners.

OF 18Y-2
Breast imaging (EUSOBI)
S. Zackrisson; Malmö/SE
(sophia.zackrisson@med.lu.se)
Author Disclosures:
Sophia Zackrisson: Patent Holder: US (application no PCT/EP2014/057372); Research Grant/Support: Swedish Cancer Society; Speaker: Siemens, Pfizer

OF 18Y-3
GI and abdominal imaging (ESGAR)
A. Laghi; Rome/IT
(andrea.laghi@uniroma1.it)
Author Disclosures:
Andrea Laghi: Advisory Board: Guerbet; Speaker: Bracco, GE Healthcare, Bayer, Guerbet

OF 18Y-4
Interventional oncology (CIRSE)
F. Gómez Muñoz; Barcelona/ES
(fernan.m.gomez@gmail.com)
J. M. Balibrea Del Castillo; Barcelona/ES
Author Disclosures:
José María Balibrea Del Castillo: Speaker: Johnson & Johnson (Ethicon), B. Braun Medical

Discussion

10:30-11:30 **Open Forum #4 (ESR)**

Open Forum Session

Jointly organised by the ESR and EIBIR

OF 18b

Safety in radiology: advancing medical imaging to the next level with EIBIR support

OF 18b-1
Chairperson's introduction
G. P. Krestin; Rotterdam/NL
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, Auntminnie

OF 18b-2
Alternatives to gadolinium: developing an alternative to gadolinium-based contrast agents (GBCAs)
R. Katz-Brull; Jerusalem/IL

Learning Objectives:
1. To learn about the research project exploring alternatives to gadolinium.
2. To learn about the development of metal-free alternatives to GBCAs.
3. To understand the pros and cons of hyperpolarised MRI agents.

OF 18b-3
Radiation risk appraisal for detrimental effects from radiation exposure during the management of patients with cancer: the SINFONIA project
A. Dasu; Uppsala/SE
(alexandru.dasu@skandion.se)

Learning Objectives:
1. To learn about the SINFONIA research project.
2. To learn about novel methodologies and tools for a comprehensive radiation risk appraisal.
3. To understand the detrimental effects of radiation exposure on patients and healthcare professionals during the management of patients.

OF 18b-4
EIBIR activities and upcoming funding opportunities
P. Gordebeke; Vienna/AT
(pgordebeke@eibir.org)

Learning Objectives:
1. To learn about EIBIR activities and support services.
2. To understand how EIBIR can increase funding success.
3. To become familiar with European research funding opportunities, in particular, Horizon Europe.

Open forum discussion

10:30-11:30 **Room A**

Round Table Session

RT 18

Building bridges: interventional oncology, one of the four pillars in cancer care

RT 18-1
Chairpersons' introduction
R. G. H. Beets-Tan; Amsterdam/NL
C. Catalano; Rome/IT

Learning Objectives:
1. To learn about interventional oncology as one of the four pillars in cancer care.
2. To understand the complementary role of interventional oncology to that of surgical oncology, medical oncology and radiation oncology.
3. To discuss the importance of collaboration between these disciplines for (cost)efficient treatment and a better outcome for the patient and to recognise cancer care as a continuum of care.
4. To recognise the synergy when the four disciplines team up together in clinics and research.

RT 18-2
Interventional oncology: one of the four pillars in cancer care
T. K. Helmberger; Munich/DE
(thomas.helmberger@muenchen-klinik.de)

RT 18-3
Surgical oncology: towards minimally invasive
G. Torzilli; Milan/IT
(guido.torzilli@hunimed.eu)

RT 18-4
Medical oncology: complementary to local treatment
A. Cervantes; Valencia/ES
(andres.cervantes@uv.es)

RT 18-5
Discussion
T. K. Helmberger; Munich/DE
A. Brady; Cork/IE
G. Torzilli; Milan/IT
(guido.torzilli@hunimed.eu)
A. Cervantes; Valencia/ES

10:30-11:30 **Room D**

Refresher Course: Vascular

RC 1815

To be up to every trick: revascularisation techniques to master complex vascular cases

RC 1815-1
Chairperson's introduction
R. Uberoi; Oxford/UK

RC 1815-2
Re-entry techniques
R. Kickuth; Würzburg/DE
(kickuth@roentgen.uni-wuerzburg.de)

Learning Objectives:
1. To review the indications for re-entry techniques in the treatment of patients with CLI.
2. To describe the step-by-step procedure and different devices.
3. To review the outcomes of this procedure.

RC 1815-4
Pedal arch revascularisation: everything that you need to know
L. Patrone; London/UK
(Lorenzo.patrone@nhs.net)

Learning Objectives:
1. To recognise the normal anatomy of infragenicular vessels and its variants.
2. To understand the correlation between clinical findings and angiographic pictures.
3. To describe a treatment algorithm to guide the recanalisation process.
4. To earn the technical skills required to succeed in below-the-ankle interventions.

RC 1815-5
Venous arterialisation for critical limb ischaemia (CLI)
C. Del Giudice; Paris/FR
(costantino.delgiudice@gmail.com)

Learning Objectives:
1. To review the indications for venous arterialisation for patients with CLI.
2. To describe the step-by-step procedure.
3. To review the outcomes of this procedure.
Author Disclosures:
Costantino Del Giudice: Speaker: Penumbra, Medtronic

Panel discussion: Techniques for everyone?

10:30-11:30 **Room E2**

Refresher Course: Cardiac

RC 1803

Imaging patients at risk of sudden cardiac death

RC 1803-1
Chairperson's introduction
J. Bogaert; Leuven/BE

RC 1803-2
Assessing cardiomyopathy and cardiac risk with MRI
D. O'Regan; London/UK
(declan.oregan@lms.mrc.ac.uk)

Learning Objectives:
1. To review how patients with cardiomyopathy are imaged with MRI.
2. To describe the adverse characteristics of disease on imaging.
3. To understand current and novel approaches for predicting outcomes in cardiomyopathy.

RC 1803-3
Imaging prior to ablation of ventricular arrhythmia
H. Cochet; Pessac/FR

Learning Objectives:
1. To learn how to identify which patients will benefit from ventricular ablation.
2. To understand how to image these patients prior to the procedure.
3. To describe how to use imaging to guide intervention.
Author Disclosures:
Hubert Cochet: Board Member: inHEART; Founder: inHEART; Share Holder: inHEART

RC 1803-4
Cardiac devices: how to image the patient and optimise image quality
A. Esposito; Milan/IT
(esposito.antonio@hsr.it)

Learning Objectives:
1. To describe the main clinical scenarios requiring CMR or CCT in patients with cardiac devices.
2. To identify when CMR or CCT is preferred in patients with cardiac devices.
3. To describe the most important safety issues and technical tips and tricks and when performing CMR and CCT in patients with cardiac devices.

Panel discussion: How should we determine who is at risk of sudden cardiac death? Is screening the answer?

10:30-11:30 **Room M 4**

E³ - The Beauty of Basic Knowledge: Problem Solving Tips and Tricks for Brain Imaging

E³ 30D

Better, faster, and artificial intelligence (AI)-driven MR imaging

Moderator
A. Alberich-Bayarri; Valencia/ES

E³ 30D-2
An introduction to MRI fingerprinting
V. C. Keil; Amsterdam/NL
(v.c.w.keil@amsterdamumc.nl)

Learning Objectives:
1. To gain a very basic understanding of how MRF works.
2. To learn how MRF differs from standard weighted and synthetic MRI.
3. To be able to recall varieties of MRF.
Author Disclosures:
Vera C. Keil: Author: Several publications on MRF; Investigator: Collaborator of Sbrizzi group on MR-Stat, former collaborator of Philips Research on MRF

E³ 30D-3
AI in fast prostate MRI harmonization and processing
A. Alberich-Bayarri; Valencia/ES
(angel@quibim.com)

Learning Objectives:
1. To learn new concepts of application of AI models to harmonize image quality with application in prostate MRI.
2. To understand how MR prostate segmentation can be streamlined from the modality.
3. To learn the impact of quantitative imaging biomarkers that can be extracted from current MR acquisition sequences.
Author Disclosures:
Angel Alberich-Bayarri: CEO: Quibim SL; Founder: Quibim SL; Share Holder: Quibim SL

E³ 30D-4
Head-only MRI scanners: why they have not yet happened, or have they?
T. O'Reilly; Leiden/NL
(t.o_reilly@lumc.nl)

Learning Objectives:
1. To name the three most significant hardware challenges that small-form-factor head-only MRI scanners face.
2. To highlight the importance of AI and advance image reconstruction for head-only MRI scanners.
3. To highlight the differences in image contrast and contrast-to-noise ratio at low field vs. high field.
4. To compare the MR safety of low-field MRI scanners to high field MRI scanners.

10:30-11:30 **Tech Gate Auditorium**

Patients in Focus

IF 18

Early detection and early diagnosis of prostate cancer, lung cancer and the involvement of radiologists

Moderators
G. Ricciardi; Rome/IT
T. Penzkofer; Berlin/DE

IF 18-2
Introduction
G. Ricciardi; Rome/IT

Learning Objectives:
1. To learn about the recent evolution of the importance of imaging in early detection of cancer.
2. To appreciate and to show that the way forward is multidisciplinary.
3. To understand the need for a uniform knowledgebase to set common standards across national borders.

IF 18-3
Radiology in the 2021 guidelines on the early detection and diagnosis of prostate cancer
T. Penzkofer; Berlin/DE

Learning Objectives:
1. To learn that the European Association of Urology's guidelines committee on the treatment of prostate cancer has a multi-professional composition.
2. To appreciate that the EAU guidelines are evidence-based, which explains why they are sometimes lagging, awaiting evidence, with EAU guidelines being reviewed every year.
3. To understand that the radiologist is a vital contributor in the early detection and diagnosis of prostate cancer.
Author Disclosures:
Tobias Penzkofer: Research Grant/Support: Berlin Institute of Health (Clinician Scientist Grant, Platform Grant), Ministry of Education and Research (BMBF), German Research Foundation (DFG), AGO, Aprea AB, ARCAGY-GINECO, Astellas Pharma Global Inc. (APGD), Astra Zeneca, Clovis Oncology, Inc., Dohme Corp, Holaira, Incyte Corporation, Karyopharm, Lion Biotechnologies, Inc., MedImmune, Merck Sharp, Millennium Pharmaceuticals, Inc., Morphotec Inc., NovoCure Ltd., PharmaMar S.A. and PharmaMar USA, Inc., Roche, Siemens Healthineers, and TESARO Inc.; Other: Fees for a book translation (Elsevier).

IF 18-4
The patient's view on early detection and diagnosis of prostate cancer
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To learn that patients are entitled to the least invasive diagnostic pathway.
2. To appreciate that decisions on treatment and procedures must be taken between the clinician (prescriber) and patient, eventually with the intervention of a multi-disciplinary tumour (MDT) board (for treatments).
3. To understand that patients may be aware of new procedural and treatment options long before they will be evidence based, and that the MDT must be willing to discuss them anyway and refer patients to clinical trials.

IF 18-5
Lung cancer early detection and diagnosis: the value of radiology
C. Franck; Edegem/BE

Learning Objectives:
1. To learn that pulmonologists and radiologists share common key roles in setting up quality rich programmes for the early detection and diagnosis of lung cancer.
2. To appreciate that prevention of lung cancer is part of deciding the risk for individual patients and proposing early detection to them.
3. To understand that the evidence is still being built to optimise early detection and diagnosis through the collaboration of radiologists and pulmonologists in high quality settings.

IF 18-6
The patient's view on early detection and diagnosis of lung cancer
A.-M. Baird; Dublin/IE

Learning Objectives:
1. To learn that effective preventive measures go hand-in-hand with early detection and diagnosis in bringing down lung cancer numbers.
2. To appreciate that patients are a partner in fighting the human cost of lung cancer and that they need to be partners in efforts to detect and diagnose lung cancer early.
3. To understand that patients are entitled to cost-effective and top-quality early detection and diagnosis of lung cancer in partnership with pulmonologists and radiologists.
Author Disclosures:
Anne-Marie Baird: Board Member: President of Lung Cancer Europe, under the auspices of which I take part in various meetings and advisory boards.

Panel discussion: How can we reach the objectives to organise early detection and diagnosis of cancers in Europe for high prevalence cancers?

10:30-12:00 **Room B**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 1819

Bone tumours: a multidisciplinary approach

E³ 1819-1
Chairperson's introduction
K. Verstraete; Ghent/BE

Learning Objectives:
1. To become familiar with the needed structure of the radiology report in bone tumours.
2. To learn the minimal and optimal imaging strategy in bone tumours.
3. To gain insights in the role of non-expert centre and expert centre in bone tumour imaging.

E³ 1819-2
Optimal radiology of bone tumours: which questions need addressing?
K. Verstraete; Ghent/BE

E³ 1819-3
What does the oncologic orthopaedic surgeon need from the radiologist?
G. Sys; Ghent/BE
(Gwen.sys@ugent.be)

E³ 1819-4
Panel discussion: The MDT on bone tumours
K. Verstraete; Ghent/BE
G. Sys; Ghent/BE
(Gwen.sys@ugent.be)

10:30-12:00 **Room C**

E³ - Advanced Courses: Cancer Imaging

E³ 1818

Peritoneal carcinomatosis in ovarian cancer: a multidisciplinary approach in real life

E³ 1818-1
Chairperson's introduction
S. Nougaret; Montpellier/FR

Learning Objectives:
1. To review the important CT and MRI parameters that need to be assessed at baseline in peritoneal carcinomatosis in ovarian cancer.
2. To discuss how structured imaging reporting can guide patient management in ovarian cancer.
3. To review the management of patients with peritoneal disease in ovarian cancers.
4. To integrate the pros and cons of the different management approaches in ovarian cancers.

E³ 1818-2
Is my patient a good candidate for hyperthermic intraperitoneal chemotherapy (HIPEC)? The surgeon's perspective
F. Quenet; Montpellier/FR
(francois.quenet@icm.unicancer.fr)

E³ 1818-3
What the surgeon and gynaecological oncologist expect from the radiologist: the radiologist's perspective
S. Nougaret; Montpellier/FR

E³ 1818-4
Multidisciplinary tumour board: case-based panel discussions
S. Nougaret; Montpellier/FR

10:30-12:00 **Room G**

E³ - Advanced Courses: Liver, Bile Ducts and Pancreas Imaging

E³ 1820

Colorectal cancer liver metastases: a multidisciplinary management of tricky cases

E³ 1820-1
Chairperson's introduction
A. Ba-Ssalamah; Vienna/AT
(ahmed.ba-ssalamah@meduniwien.ac.at)

Learning Objectives:
1. To review the diagnostic, therapeutic, and strategic improvements that have contributed to the current 'state-of-the-art' diagnostic and treatment approaches.
2. To discuss guidance for the comprehensive management of patients with mCRC going forward.
3. To become familiar with pre-surgical staging with a focus on detection and the false-positive rate of different imaging modalities (CT and MRI with extracellular and hepatobiliary contrast media).
4. To become familiar with the role of diffusion-weighted imaging (DWI) and the hepatobiliary phase in the diagnosis of metastases.
5. To review the challenges of liver staging post chemotherapy.
Author Disclosures:
Ahmed Ba-Ssalamah: Speaker: Bayer, Sanofi

E³ 1820-2
Colorectal liver cancer metastases: critical appraisal of current imaging techniques
A. Ba-Ssalamah; Vienna/AT
(ahmed.ba-ssalamah@meduniwien.ac.at)
Author Disclosures:
Ahmed Ba-Ssalamah: Speaker: Bayer, Sanofi

E³ 1820-3
How to manage colorectal cancer liver metastases and disappearing colorectal cancer liver metastases: the role of surgery
S. Stättner; Vöcklabruck/AT
(s.staettner@icloud.com)

E³ 1820-4
The role of interventional radiology
M. Meijerink; Amsterdam/NL
(mr.meijerink@amsterdamumc.nl)
Author Disclosures:
Martijn Meijerink: Author: Springer Verlag; Advisory Board: Johnson & Johnson, Medtronic Covidien, Angiodynamics; CEO: Interventional Oncology Solutions; Equipment Support Recepient: Johnson & Johnson, Medtronic Covidien, Angiodynamics; Grant recepient: Johnson & Johnson, Medtronic Covidien, Angiodynamics; Research Grant/Support: Johnson & Johnson, Medtronic Covidien, Angiodynamics; Speaker: Johnson & Johnson, Medtronic Covidien, Angiodynamics, Guerbet

E³ 1820-5
Multidisciplinary tumour board: case-based panel discussion
A. Ba-Ssalamah; Vienna/AT
(ahmed.ba-ssalamah@meduniwien.ac.at)
Author Disclosures:
Ahmed Ba-Ssalamah: Speaker: Bayer, Sanofi

10:30-12:00 **Room K**

E³ - Advanced Courses: Lung, Mediastinum and Pleural Imaging

E³ 1831

Common and less common pleural neoplasms: a multidisciplinary approach

E³ 1831-1
Chairperson's introduction
M.-P. Revel; Paris/FR

Learning Objectives:
1. To recognise key imaging features for the diagnosis of common and uncommon pleural neoplasms.
2. To identify CT features suggesting malignant solitary fibrous tumour.
3. To identify potential risks of an inadequate management of pleural neoplasms.
Author Disclosures:
Marie-Pierre Revel: Speaker: GE Healthcare, Bracco, Chiesi, Boeringher-Ingelheim; Other: Expert annotation for GE Healthcare and Gleamer

E³ 1831-2
How to manage pleural neoplasms: the clinician's perspective
N. Girard; Paris/FR
(nicolas.Girard2@curie.fr)
Author Disclosures:
Nicolas Girard: Advisory Board: BMS, MSD

E³ 1831-3
How to diagnose and stage malignant mesothelioma
F. Gleeson; Oxford/UK

Learning Objectives:
1. To learn about the different presentations of malignant mesothelioma.
2. To learn about the staging of mesothelioma.
3. To learn about the benefits of different imaging techniques in the diagnosis and staging of malignant mesothelioma.
Author Disclosures:
Fergus Gleeson: Board Member: RAIQC Ltd; Equipment Support Recepient: Non personal. Polarean; Founder: RAIQC Ltd; Grant recepient: NIHR, UKRI; Investigator: IDEAL, DART, EXPLAIN; Research Grant/Support: NIHR, UKRI; Share Holder: Optellum

E³ 1831-4
Less common pleural malignancies: how to recognise them on CT
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)

Learning Objectives:
1. To learn about the CT features of benign and malignant solitary fibrous tumours.
2. To learn about the management of desmoid tumours.
3. To learn about the differentials and diagnostic strategy.
Author Disclosures:
Marie-Pierre Revel: Speaker: GE Healthcare, Bracco, Chiesi, Boeringher-Ingelheim; Other: Expert annotation for GE Healthcare and Gleamer

E³ 1831-5
Multidisciplinary tumour board: case-based panel discussion
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)
T. Klikovits; Vienna/AT
Author Disclosures:
Marie-Pierre Revel: Speaker: GE Healthcare, Bracco, Chiesi, Boeringher-Ingelheim; Other: Expert annotation for GE Healthcare and Gleamer

10:30-12:00 **Room O**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 1821

Pelvic pain in female patients

E³ 1821-1
Acute pain
M. Otero García; Vigo/ES
(milagros.otero.garcia@sergas.es)

Learning Objectives:
1. To become familiar with different uterine and adnexal pathologies presenting acute pelvic pain.
2. To learn about integrating clinical findings with imaging features before establishing a diagnosis.

E³ 1821-2
Chronic pain
M. C. Javitt; Haifa/IL
(femscan@aol.com)

Learning Objectives:
1. To become familiar with different uterine and adnexal pathologies presenting chronic pelvic pain.
2. To learn about integrating clinical findings with imaging features before establishing a diagnosis.

12:30-13:30 **Open Forum #1 (Radiographers)**

E³ - Young ECR Programme: Basic Sessions

Organised by the EFRS

BS 19

Enhancing radiographer communication

Moderator
B. Moeller Christensen; Jönköping/SE

BS 19-2
Optimising communication strategies
A. Taylor; Exeter/UK
(A.Taylor11@exeter.ac.uk)

Learning Objectives:
1. To become familiar with the psychodynamics of helping strategies.
2. To understand appropriate patient management.
3. To discuss verbal and non-verbal communication skills.

BS 19-3
Communicating benefit versus risk
J. Portelli; Msida/MT
(jonathan.portelli@um.edu.mt)

Learning Objectives:
1. To raise awareness of the responsibility to engage in benefit-risk dialogue.
2. To outline benefit-risk communication strategies.
3. To provide examples of good practice.

BS 19-4
Patient-centred care and communication
E. Hyde; Derby/UK
(E.Hyde@derby.ac.uk)

Learning Objectives:
1. To raise awareness of the need for individualised communication and care.
2. To provide examples of the diversity of communication needs.
3. To discuss the importance of patient involvement in communication strategies.

Panel discussion: How can we achieve enhanced communication whilst being time effective?

12:30-13:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 19Y

Career paths: research

OF 19Y-1
Chairperson's introduction
V. Vilgrain; Clichy/FR

Learning Objectives:
Part of a series of sessions dedicated to exploring different career paths in radiology.The session's goal is to discuss how a research career might be facilitated, what are the different roles in research, the importance of a mentor, and to go through the pros and cons of a career in radiological research.

OF 19Y-2
How to build/facilitate a research career
J. Stoker; Amsterdam/NL

OF 19Y-3
The young academic radiologist: what are the attractions and difficulties
N. Kartalis; Stockholm/SE
(nikolaos.kartalis@ki.se)

Discussion

12:30-13:30 **Open Forum #3 (ESR)**

Open Forum Session

Organised by ESR Publications Committee

OF 19a

How to get my manuscript accepted: tips and tricks from the editors

OF 19a-1
Chairperson's introduction
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, AuntMinnie

OF 19a-2
How to "polish" a submission
Y. Menu; Paris/FR
(yves.menu@aphp.fr)

Learning Objectives:
1. To learn the importance of the cover letter.
2. To understand how the title and key points are instrumental in drawing the reader's attention.
3. To become familiar with the optimal construction of the introduction and the discussion.
4. To be able to differentiate what should be in the "Material and Method" or in the "Results" sections.
5. To learn how a bibliography should be built and checked.

OF 19a-3
How to reply to reviewers' criticism
F. Sardanelli; San Donato Milanese/IT
(francesco.sardanelli@unimi.it)

Learning Objectives:
1. To learn what to do when the reviewer is right.
2. To learn what to do when the reviewer is wrong.
3. To learn what to do when the two reviewers disagree.
4. To learn how to make the revised manuscript easier to read.
Author Disclosures:
Francesco Sardanelli: Advisory Board: Bayer, Bracco, DeepTrace Technologies, General Electric; Equipment Support Recepient: General Electric; Research Grant/Support: Bayer, Bracco, General Electric; Speaker: Bayer, General Electric

OF 19a-4
How to manage critical reviews
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)

Learning Objectives:
1. To understand how critical reviews should be conducted.
2. To learn how critical reviews are reviewed.
3. To be able to manage levels of evidence and recommendations.

Open forum discussion

12:30-13:30 **Room A**

Round Table Session

RT 19

Building bridges: endovascular treatment (EVT) of acute ischaemic stroke - optimising stroke networks

RT 19-1
Chairperson's introduction
W. van Zwam; Maastricht/NL

Learning Objectives:
1. To understand the organisation of a stroke network.
2. To understand various patient selection and transfer strategies in different geographical regions.
3. To understand the role of (neuro)radiologists and other specialists in acute stroke networks.
4. To know how the quality of networks can be assessed and monitored.

RT 19-2
What is a spoke and hub, drip 'n' ship, drip 'n' drive or a level 1, 2 and 3 stroke centre?
M. Psychogios; Basel/CH
Author Disclosures:
Marios Psychogios: Research Grant/Support: Unrestricted Grants from Swiss National Science Foundation (SNF), Bangerter-Rhyner Stiftung, Stryker Neurovascular Inc., Phenox GmbH, Medtronic Inc. and Rapid Medical Inc., and Penumbra Inc for the DISTAL trial SNF Grant for the TECNO trial, SNF Grant for the AGELESS trial Research agreement with Siemens Healthineers AG (money paid to institution) Grant for SPINNERS trial from Siemens Healthineers AG; Speaker: Stryker Neurovascular Inc., Medtronic Inc., Penumbra Inc., Acandis GmbH, Phenox GmbH, Siemens Healthineers AG (money paid to institution)

RT 19-3
Bypassing primary stroke centres: when to do it and when not?
M. Ribo; Barcelona/ES
(marcriboj@hotmail.com)
Author Disclosures:
Marc Ribo: Author: PI of the Racecat trial

RT 19-4
When there are not enough INRs: are other specialists a helping hand or a threat?
M. Rubiera; Barcelona/ES
(mrubifu@hotmail.com)

RT 19-5
Discussion
V. Caso; Perugia/IT
M. Psychogios; Basel/CH
M. Ribo; Barcelona/ES
(marcriboj@hotmail.com)
M. Rubiera; Barcelona/ES
Author Disclosures:
Marios Psychogios: Research Grant/Support: Unrestricted Grants from Swiss National Science Foundation (SNF), Bangerter-Rhyner Stiftung, Stryker Neurovascular Inc., Phenox GmbH, Medtronic Inc. and Rapid Medical Inc., and Penumbra Inc for the DISTAL trial SNF Grant for the TECNO trial, SNF Grant for the AGELESS trial Research agreement with Siemens Healthineers AG (money paid to institution) Grant for SPINNERS trial from Siemens Healthineers AG; Speaker: Stryker Neurovascular Inc., Medtronic Inc., Penumbra Inc., Acandis GmbH, Phenox GmbH, Siemens Healthineers AG (money paid to institution)
Marc Ribo: Author: co-PI of the RACECAT trial

12:30-13:30 **Room B**

E³ - The Beauty of Basic Knowledge: Pancreas

E³ 25E
Chronic pancreatitis

Moderator
W. Schima; Vienna/AT

E³ 25E-2
How to diagnose and classify
F. Akisik; Indianapolis, IN/US
(makisik@iupui.edu)

Learning Objectives:
1. To learn about the diagnosis of chronic pancreatitis.
2. To understand the classification of chronic pancreatitis.
3. To appreciate the role of imaging in the follow-up of chronic pancreatitis.

E³ 25E-3
Functional evaluation of chronic pancreatitis
R. Manfredi; Rome/IT
(riccardo.manfredi@unicatt.it)

Learning Objectives:
1. To appreciate the functional evaluation of chronic pancreatitis.
2. To learn about the role of imaging in recurrent pancreatitis.
3. To illustrate secretin-enhanced magnetic resonance cholangiopancreatography (MRCP) signs of chronic pancreatitis.
Author Disclosures:
Riccardo Manfredi: Speaker: Bracco, Bayer

12:30-13:30 **Room C**

Refresher Course: Hybrid, Molecular and Translational Imaging

RC 1906
State of the art and emerging applications for PET

RC 1906-1
Chairperson's introduction
F. E. Lecouvet; Brussels/BE

RC 1906-2
The potential of novel PET tracers
D. Oprea-Lager; Amsterdam/NL
(d.oprea-lager@vumc.nl)

Learning Objectives:
1. To describe and identify the physiological distribution of radiolabelled PSMA tracers.
2. To list three of the most commonly observed pitfalls when using radiolabelled PSMA tracers.
3. To describe and reflect on the indications for using PSMA PET/CT in clinical practice.
Author Disclosures:
Daniela Oprea-Lager: Research Grant/Support: Unrestricted grants from Jansen for consensus nuclear medicine meetings in 2020 and 2022; Speaker: Remuneration as speaker BMUC 2022

RC 1906-3
Clinical applications for PET/MRI
L. Umutlu; Essen/DE

Learning Objectives:
1. To understand the potential technical advantages of PET/MRI.
2. To understand the potential clinical advantages of PET/MRI.
3. To understand the potential new applications for PET/MRI.
Author Disclosures:
Lale Umutlu: Advisory Board: Siemens Healthineers, Bayer Healthcare, VARA AI; Research Grant/Support: Siemens Healthineers; Speaker: Siemens Healthineers, Bayer Healthcare

RC 1906-4
Total-body PET (TBP) as a new tool
A. Rominger; Bern/CH
(axel.rominger@insel.ch)

Learning Objectives:
1. To understand the potential technical advantages offered by TBP.
2. To understand the clinical advantages of TBP.
3. To understand the potential new applications that TBP offers.
Author Disclosures:
Axel Rominger: Advisory Board: AAA; Research Grant/Support: Siemens Healthineers; Speaker: Siemens Healthineers; GE

Panel discussion: Which modality will predominate in cancer imaging in 10 years' time?

12:30-13:30 **Room E1**

E³ - The Beauty of Basic Knowledge: Problem Solving Tips and Tricks for Brain Imaging

E³ 30E
What is new in the imaging of brain tumours

Moderator
B. Ertl-Wagner; Toronto, ON/CA

E³ 30E-2
How to report follow-up examinations in patients with brain tumours
A. Cianfoni; Rome/IT
(acianfoni@hotmail.com)

Learning Objectives:
1. To review the imaging methods that are best suited for the assessment of tumour response or progression.
2. To discuss the new treatment paradigms.
3. To become familiar with how quantitative imaging techniques can be used to accurately assess follow-up.

E³ 30E-3
A critical appraisal of advanced imaging techniques in brain tumours
S. Gaudino; Rome/IT

Learning Objectives:
1. To identify which imaging sequences should be part of the routine imaging protocol (DWI/DTI, perfusion, MRS, and SWI).

2. To learn how to differentiate between the tumour boundary and the surrounding oedema.
3. To discuss recommendations to improve the reproducibility of follow-up studies.

E³ 30E-4
Imaging findings in unusual brain tumours
A. Castellano; Milan/IT
(castellano.antonella@hsr.it)

Learning Objectives:
1. To review the new tumour classes identified by WHO.
2. To discuss how to offer differential diagnostic considerations.
3. To assess whether new imaging techniques offer more information.

12:30-13:30 **Room G**

Refresher Course: Musculoskeletal

RC 1910

Pros and cons: MRI is the preferred imaging modality in musculoskeletal imaging

RC 1910-1
Chairperson's introduction
A. P. Parkar; Bergen/NO
(apparkar@gmail.com)

RC 1910-2
PRO
A. S. Gersing; Munich/DE

Learning Objectives:
This house believes that MRI is the preferred imaging modality in musculoskeletal imaging.

RC 1910-3
CON
A. Blum; Nancy/FR
(alain.blum@gmail.com)

Learning Objectives:
This house believes that MRI is NOT the preferred imaging modality in musculoskeletal imaging.

Panel discussion: Overall clinical use of MRI versus dual energy CT in MSK practice (strengths, weaknesses, and pitfalls) and how to implement it

12:30-13:30 **Room M 4**

E³ - The Beauty of Basic Knowledge: A Survival Guide to Musculoskeletal Imaging

E³ 24E

Is it a bone tumour?

Moderator
V. Vasilevska-Nikodinovska; Skopje/MK

Learning Objectives:
The presence of tumoural tissue in bone (primary or secondary) can result in a predominantly lytic or sclerotic radiographic manifestation. The plain film is still the initial mainstay of diagnosis. Its interrogation requires a disciplined approach to detect and provide a differential diagnosis, which also includes pseudotumoural conditions. Advanced imaging techniques can then be employed to narrow the diagnostic options, and to suggest and avoid biopsy.

E³ 24E-2
The lytic lesion
U. Aydingoz; Ankara/TR
(uaydingo@hacettepe.edu.tr)

Learning Objectives:
1. To describe the typical radiographic features of common lytic bone tumours.
2. To explain how the radiographic features of lytic bone tumours relate to their pathophysiology.
3. To explain the principles of characterisation and staging of lytic bone tumours.

E³ 24E-3
The sclerotic lesion
J. L. Bloem; Leiden/NL
(j.l.bloem@lumc.nl)

Learning Objectives:
1. To explain how imaging features of sclerosis reflect pathophysiology.
2. To describe typical features of different types of bone tumour sclerosis.
3. To differentiate benign from malignant sclerotic bone tumours.
Author Disclosures:
Johan L. Bloem: Grant recepient: Varian and Philips

E³ 24E-4
Pseudotumours
A. H. Karantanas; Iraklion/GR
(akarantanas@gmail.com)

Learning Objectives:
1. To present the most common developmental variants that may simulate an osseous tumour.
2. To depict and interpret the mass-like lesions of the bone marrow as shown on MRI.
3. To learn the pros and cons of x-rays, CT, and MRI on common symptomatic and asymptomatic osseous pseudotumours.

Panel discussion

12:30-13:30 **Room N**

ESR meets Ukraine

Meets 19

Practicing a multidisciplinary approach in Ukrainian radiology

Presiding
R. G. H. Beets-Tan; Amsterdam/NL
T. Yalynska; Kiev/UA

Meets 19-1
Welcome by the ESR president
R. G. H. Beets-Tan; Amsterdam/NL

Meets 19-2
Introduction: Ukrainian radiologists on the way to new achievements as part of multidisciplinary teams
T. Yalynska; Kiev/UA
(tyalynska@gmail.com)

Learning Objectives:
1. To provide an overview of the current situation in radiology in different regions of Ukraine.
2. To introduce the contribution of Ukrainian radiologists to the development of imaging technologies in Ukraine.
3. To demonstrate how Ukrainian radiologists introduce new possibilities of radiology to doctors of other specialties.
4. To display the main areas of work within the Association of Radiologists of Ukraine, including multidisciplinary and multimodality trends in radiology.
5. To share examples of cooperation between radiologists and other medical professionals.

Meets 19-3
Radiogenomics of the renal cell carcinoma: a multidisciplinary approach
Y. Mytsyk; Lviv/UA

Learning Objectives:
1. To demonstrate the trends towards a multidisciplinary and personalised approach to the management of renal cell carcinoma.
2. To explain "radiogenomics", what it is and what its potential clinical applications are.
3. To demonstrate the current trends in radiogenomics of renal cell carcinoma.

Meets 19-4
Multiparametric ultrasound diagnostic (mp-US) of non-alcoholic fatty liver disease (NAFLD) and ist complications
O. Dynnyk; Kiev/UA
(obdynnyk@gmail.com)

Learning Objectives:
1. To describe the general concept of non-alcoholic fatty liver disease (NAFLD) as an endocrinological problem, as well as the multiaetiological, multidisciplinary, and multi-complication outcomes.
2. To demonstrate the wide spectrum of qualitative and quantitative parameters of US data, including multiparametric ultrasound diagnostic (mp-US).
3. To demonstrate the advantages and disadvantages of mp-US for NAFLD management.
4. To list the advantages of mp-US and multi-organ imaging in the detection of oncological, cardiovascular, cerebrovascular, and digestive complications of NAFLD.

Meets 19-5
Additive value of hybrid imaging in the multidisciplinary team management of oncologic patients
M. Novikov; Kiev/UA
(nicknovi@gmail.com)

Learning Objectives:
1. To discuss the role of hybrid imaging in important scenarios and timepoints of the multidisciplinary team's management of oncologic patients, including differential diagnosis and biopsy site choice, staging, treatment planning (particularly for radiotherapy planning), and therapy response assessment and prognostication.

Panel discussion: How do the advances in radiology affect the personification of medical care?

12:30-13:30 **Room O**

Patients in Focus

Jointly organised by the ESR, ESR-PAG and eHealth and Informatics Subcommittee

IF 19a

Communication between radiologist and patient in 2030: ways towards digital health solutions

Moderators
A. Brady; Cork/IE
E. Briers; Hasselt/BE

IF 19a-2
Introduction: the way towards digitalised medicine
A. Brady; Cork/IE
(adrianbrady@me.com)

Learning Objectives:
1. To learn what the pandemic has taught us regarding our existing health system.
2. To appreciate digital health tools that are already implemented and to put a focus on the advantages they bring.
3. To understand where and exactly how digital tools make sense and can be implemented.

IF 19a-3
The radiologist's view on their digital future
E. Kotter; Freiburg/DE

Learning Objectives:
1. To learn how artificial intelligence and machine learning will change the field of radiology, and to underline how this can free time for "doctor-to-patient" communication.
2. To appreciate that patients will need information to be correct and understandable, which means that it may need to be non-digital.
3. To understand that patients are entitled to be informed as soon as possible on their condition through the most efficient communication channels.
Author Disclosures:
Elmar Kotter: Advisory Board: Contextflow; Share Holder: Contextflow; Speaker: Siemens Healthineers, AbbVie

IF 19a-4
How secured digital communication can be provided between doctors, patients and other health care providers
A. Busch; Wiener Neustadt/AT
(anne.busch@fhwn.ac.at)

Learning Objectives:
1. To understand the challenges of secured digital communication.
2. To describe what is required to implement secured digital communication.
3. To discuss the benefits available for all parties.

IF 19a-5
The underprivileged patient and the drive towards the digital world
E. Briers; Hasselt/BE
(erikbriers@telenet.be)

Learning Objectives:
1. To learn that a decent portion of the patient population has limited learning abilities and relies on doctor-to-patient direct communication.
2. To appreciate that not all patients have access to digital tools and, hence, digital information.
3. To understand that even with the evolution to increasingly digital information flows, classical information will be needed and that even these will be challenging for some patients, and it will therefore be crucial to train radiologists to communicate with underprivileged patients.

Panel discussion: How can we maximise the valuable effects of digital health solutions in a world where, even today, so many have no connection to the digital world and lack digital skills and even learning capacity?

12:30-13:30 **Tech Gate Auditorium**

Patients in Focus

IF 19b

Relaxation: quick communication training BATHEing method

Moderators
A. G. Rockall; London/UK
C. Justich; Vienna/AT

IF 19b-2
An introduction to Mindfulness Based Stress Release (MBSR)
M. Kainz; Vienna/AT

Learning Objectives:
1. To provide a short introduction to MBSR.
2. To demonstrate studies that support quality of life in cancer.
3. To introduce radiologists and radiographers to breathing techniques and teach them on site how to calm down and reduce the stress of nervous patients and themselves before having to give critical diagnostic findings to a patient.

IF 19b-3
Why the right doctor-patient interaction is so important and what is planned to achieve the goal
A. G. Rockall; London/UK

Learning Objectives:
1. To introduce how important it is to optimise the workflow for the radiologist with the right preparation.
2. To demonstrate how this preparation could be implemented through a common approach to preparing the patient, such as illustrations that minimise language barriers and can be used across national borders.
3. To introduce the proposed communication training programme for radiologists by ESOR.

IF 19b-4
An introduction to the BATHEing method
C. Justich; Vienna/AT
(cjustich@me.com)

Learning Objectives:
1. To explain why training is important.
2. To demonstrate that it is easy to learn and to implement.
3. To prove that, although it takes a maximum of 10 minutes, it can make a huge difference.

14:00-15:00 **Open Forum #1 (Radiographers)**

Open Forum Session

Jointly organised by the EFRS and ESMRMB

OF 20R
MR safety updates for radiographers

Moderator
J. McNulty; Dublin/IE

Learning Objectives:
1. To summarise the latest updates in MR safety and MR contrast agent use.
2. To discuss key safety considerations for those working in MRI.
3. To describe the role of the MR safety officer based on the EFRS role descriptor.

OF 20R-2
What is new in MR safety?
T. Owman; Lund/SE
(titti.owman@gmail.com)

OF 20R-3
Gadolinium-based contrast agents: where are we now?
M. Zanardo; Milan/IT
(moreno.zanardo@unimi.it)

OF 20R-4
The MR safety officer (MRSO): role descriptors
C. Malamateniou; London/UK
(christina.malamateniou@city.ac.uk)
Author Disclosures:
Christina Malamateniou: Research Grant/Support: Siemens Healthineers, annalise.ai

Open forum discussion

14:00-15:00 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 20Y
Cases of the day quiz for radiology residents

Quiz Masters
M. Klontzas; Iraklion/GR
(miklontzas@gmail.com)
S. Afat; Tübingen/DE
(saif.afat@med.uni-tuebingen.de)

14:00-15:00 **Open Forum #3 (ESR)**

Open Forum Session

Organised by ESR Publications Committee

OF 20a
Social media for beginners: tips and tricks for all generations!

OF 20a-1
Chairperson's introduction
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, AuntMinnie

OF 20a-2
What is social media?
D. Pinto dos Santos; Cologne/DE
(daniel.pinto-dos-santos@uk-koeln.de)

Learning Objectives:
1. To familiarise yourself with the most used platforms.
2. To learn what you can find and how to find information on social media.
3. To understand 'TIL', 'tweeps' and other common lingo.
Author Disclosures:
Daniel Pinto dos Santos: Advisory Board: cook medical; Speaker: Bayer

OF 20a-3
Where do I start?
F. Vernuccio; Padova/IT
(federicavernuccio@gmail.com)

Learning Objectives:
1. To understand how to choose the right platform(s) for you.
2. To become familiar with the basics of setting up your account(s).
3. To become familiar with the dos and don'ts of using social media.
Author Disclosures:
Federica Vernuccio: Other: None related to this presentation (received support from Bracco and GE to attend meetings, lecture fee for Guerbet)

OF 20a-4
Why should I use social media?
B. Baeßler; Würzburg/DE
(bettina.baessler@googlemail.com)

Learning Objectives:
1. To understand why social media is not just for 'young people'.
2. To get informed about the benefits of active participation.
3. To learn about the benefits of passive participation.
Author Disclosures:
Bettina Baeßler: CEO: Lernrad GmbH

Open forum discussion: Ask all the questions you never dared to ask!

14:00-15:00 **Open Forum #4 (ESR)**

Open Forum Session

Organised by the ESR Ultrasound Subcommittee

OF 20b
How will ultrasound fit within a radiology department in 20 years?

OF 20b-1
Chairpersons' introduction
P. S. Sidhu; London/UK
B. Brkljačić; Zagreb/HR
Author Disclosures:
Paul S. Sidhu: Advisory Board: ITREAS, SAMSUNG; Equipment Support Recepient: Philips, Samsung; Investigator: Bracco; Speaker: Siemans, Philips, Samsung, ITREAS

OF 20b-2
Thoughts from the German model: primary care-based ultrasound, hospital based US hubs run for radiologists and non-radiologists?
T. Fischer; Berlin/DE
(thom.fischer@charite.de)

Learning Objectives:
1. To learn about the organisation of ultrasound activities under a single roof with a more efficient use of human resources and equipment.
2. To expand the field of medical ultrasound applications resulting in a marked increase in the number of US examinations.
3. To improve the quality of further and advanced training in ultrasonography and transdisciplinary research through the provision of high-end equipment and a greater interest of all stakeholders.
Author Disclosures:
Thomas Fischer: Advisory Board: Canon, Siemens, Bracco; Speaker: Canon, Siemens, Bracco

OF 20b-3
Doctors using ultrasound only as an imaging technique: is this the route for radiologists?
V. Mitkov; Moscow/RU
(vv@mitkov.ru)

Learning Objectives:
1. To learn the advantages of creating a medical specialty of "ultrasound diagnostics doctor".
2. To learn the advantages of creating interdisciplinary departments of ultrasound diagnostics.
3. To consider the benefits of such a system when working in regions with extremely low population density.

OF 20b-4
UK model of sonographers-based studies with few examinations performed by the radiologist: how to teach and maintain interest for radiology and will other specialities take over?
P. S. Sidhu; London/UK

Learning Objectives:
1. To understand the advantages and disadvantages of the UK model of a sonographer-led ultrasound service.
2. To be able to understand and discuss the declining interest in diagnostic ultrasound amongst radiologists and potential solutions to mitigate this as well as the reasons why it is important for radiologists to remain a major player.
3. To understand the future utility of ultrasound amongst all medical specialities and also within allied health professionals and the difficulties in regulation and ensuring standardised practice.
Author Disclosures:
Paul S. Sidhu: Advisory Board: ITREAS, Samsung; Investigator: Bracco; Speaker: Bracco, Siemens, Samsung, Philips

Open forum discussion

14:00-15:00 **Room A**

Round Table Session

RT 20

Building bridges: radiology and radiation therapy, a match made in heaven?

RT 20-1
Chairpersons' introduction
R. G. H. Beets-Tan; Amsterdam/NL
L. E. Derchi; Genoa/IT

Learning Objectives:
1. To learn about the increasing role of imaging in radiation treatment.
2. To understand how it will impact collaboration in technology innovation.
3. To know how image guidance is used in the daily clinical practice of radiation oncology.

The use of imaging to guide radiation therapy: an interview with the expert (video – no speaker, no live presentation)

RT 20-2
Discussion
V. Valentini; Rome/IT
B. Ohnesorge; Erlangen/DE
C. Catalano; Rome/IT
P. Luijten; Utrecht/NL

14:00-15:00 **Room F1**

Refresher Course: GI Tract

RC 2001

Advanced colon cancer: the beginning or the end?

RC 2001-1
Chairperson's introduction
M. J. Lahaye; Amsterdam/NL

RC 2001-2
What does a clinician want to know in advanced colorectal cancer? A colorectal surgeon's view
F. Quenet; Montpellier/FR
(francois.quenet@icm.unicancer.fr)

Learning Objectives:
1. To become familiar with new developments in treatment options for colon cancer.
2. To learn about the cytoreductive surgery in colorectal patients with peritoneal metastases.
3. To learn about what a surgeon wants to know before going to surgery in colorectal cancer patients.

RC 2001-3
Strengths and limitations of CT in advanced colorectal cancer
A. Laghi; Rome/IT
(andrea.laghi@uniroma1.it)

Learning Objectives:
1. To understand the role of CT in the diagnostic workup of advanced colorectal cancer patients.
2. To recognise important clinically relevant CT features in colon cancer.
3. To discuss the strengths and limitations of CT for advanced colorectal cancer patients.
Author Disclosures:
Andrea Laghi: Advisory Board: Guerbet; Speaker: Guerbet, Bracco, Bayer, GE Healthcare

RC 2001-4
Strengths and limitations of MRI in advanced colorectal cancer
V. Vandecaveye; Leuven/BE
(vincent.vandecaveye@uzleuven.be)

Learning Objectives:
1. To become familiar with a dedicated MRI protocol for advanced colorectal cancer patients.
2. To recognise important clinically relevant MRI features in colon cancer.
3. To discuss the strengths and limitations of MRI for advanced colorectal cancer patients.

Panel discussion: Case-based

14:00-15:00 **Room M 4**

Refresher Course: Musculoskeletal

RC 2010

My top three tips for musculoskeletal ultrasound imaging

RC 2010-1
Chairperson's introduction
M. Adriaensen; Heerlen/NL

RC 2010-2
My top three tips for ultrasound of the shoulder
A. J. Grainger; Cambridge/UK

Learning Objectives:
1. To describe how to recognise common pathologies.
2. To list pitfalls and explain how to avoid them.
3. To provide useful tips for ultrasound-guided treatment and intervention.
Author Disclosures:
Andrew J. Grainger: Speaker: Canon Medical UK

RC 2010-3
My top three tips for ultrasound of the elbow and forearm
H. Al Bulushi; Muscat/OM

Learning Objectives:
1. To describe how to recognise common pathologies.
2. To list pitfalls and explain how to avoid them.
3. To provide useful tips for ultrasound-guided treatment and intervention.

RC 2010-4
My top three tips for ultrasound of the fingers and thumb
C. McCarthy; Oxford/UK

Learning Objectives:
1. To describe the ultrasound findings of central slip tears (or annular pulley tears).
2. To demonstrate the value of dynamic imaging in skier's thumb.
3. To illustrate the technique of percutaneous ultrasound-guided trigger finger release.

RC 2010-5
My top three tips for ultrasound of the groin and hip
J. Jacobson; Cincinnati, OH/US
(jon.jacobson.rad@gmail.com)

Learning Objectives:
1. To recognise the expected appearances of the anterior hip that should not be confused with effusion.
2. To list the most common pathology attributed to greater trochanteric pain syndrome.
3. To summarise the effectiveness of tendon fenestration and platelet-rich plasma for the treatment of gluteal tendinopathy.
Author Disclosures:
Jon Jacobson: Advisory Board: Philips; Board Member: POCUSpro; Other: Book royalties: Elsevier

RC 2010-6
My top three tips for ultrasound of the knee
A. Plagou; Athens/GR
(athena.plagou@gmail.com)

Learning Objectives:
1. To describe how to recognise common pathologies.
2. To list pitfalls and explain how to avoid them.
3. To provide useful tips for ultrasound-guided treatment and intervention.

RC 2010-7
My top three tips for ultrasound of the midfoot and toes
C. Martinoli; Genoa/IT
(55904@unige.it)

Learning Objectives:
1. To describe how to recognise common pathologies.
2. To list pitfalls and explain how to avoid them.
3. To provide useful tips for ultrasound-guided treatment and intervention.
Author Disclosures:
Carlo Martinoli: Equipment Support Recepient: Canon, Esaote; Speaker: Canon, Esaote, Novartis, Novo Nordisk, Pfizer, Philips, Sobi, Roche, and Takeda

Panel discussion: The current role of ultrasound of joint imaging compared to other imaging methods

14:00-15:00 **Room X**

Refresher Course: Paediatric

RC 2012

Imaging in congenital heart disease (CHD)

RC 2012-1
Chairperson's introduction
L. K. R. Suther; Oslo/NO

RC 2012-2
CT and MRI in neonates and infants with congenital heart disease
A. Secinaro; Rome/IT
(aurelio.secinaro@opbg.net)

Learning Objectives:
1. To learn about the use of radiology in the different stages towards full surgical correction.
2. To become aware of the most common complications in relation to surgical correction.
3. To discuss the strength and limitations of CT and MRI in these patients.

RC 2012-3
CT and MRI in grown-up congenital heart disease (GUCH) patients
K.-F. Kreitner; Mainz/DE
(Karl-Friedrich.Kreitner@unimedizin-mainz.de)

Learning Objectives:
1. To learn about the use of radiology in cardiac follow-up of grown-ups with CDH.
2. To become aware of the strengths and limitations of CT and MRI in the most common cardiac complications of CHD.
3. To discuss the ideal follow-up program towards adulthood.

RC 2012-4
Extra-cardiac complications in congenital heart disease
C. E. de Lange; Gothenburg/SE
(charlotte.de.lange@vgregion.se)

Learning Objectives:
1. To learn about the most common extra-cardiac complications of CHD.
2. To become familiar with the different radiological tools used for these patients.
3. To discuss the best follow-up strategy in these complications.

Panel discussion: Multi-modality imaging approach to CHD

14:00-15:30 **Room B**

E³ - Advanced Courses: Head and Neck Imaging

E³ 2022

Anterior skull base tumours: a multidisciplinary approach

E³ 2022-1
Chairperson's introduction
B. M. Verbist; Leiden/NL

Learning Objectives:
1. To interpret diagnostic imaging findings of skull base tumours.
2. To understand how information from imaging impacts treatment choice.
3. To suggest possible recurrence based on imaging findings.

E³ 2022-2
Imaging strategy in the evaluation of anterior skull base tumours
R. Maroldi; Brescia/IT
(roberto.maroldi@unibs.it)

Learning Objectives:
1. To describe a dedicated MRI protocol for imaging (anterior) skull base tumours.
2. To list findings indicative of dural invasion on MRI.
3. To integrate CT and MRI findings in reporting anterior skull base tumours.

E³ 2022-3
Benefits, limitations, and contraindications for endoscopic resection of anterior skull base tumours
P. Nicolai; Brescia/IT

Learning Objectives:
1. To describe transnasal endoscopic surgery (TES) advantages versus craniofacial resection for anterior skull base tumours.
2. To summarise the technical innovations for TES (navigation, 3-D endoscopy, and 3D printing).
3. To identify 'red flags' for endoscopic surgery on cross-sectional imaging.

E³ 2022-4
Benefits and limitations of proton therapy in the treatment of skull base tumours
V. Gregoire; Lyon/FR
(vincent.gregoire@lyon.unicancer.fr)

Learning Objectives:
1. To describe the indications for radiotherapy in skull base tumours.
2. To summarise the outcome of radiotherapy (efficacy and toxicity).
3. To discuss the technical challenges of base of skull radiotherapy.

E³ 2022-5
Multidisciplinary tumour board: case-based panel discussion
B. M. Verbist; Leiden/NL

14:00-15:30 **Room C**

E³ - Advanced Courses: Gynaecology/Genitourinary Imaging

E³ 2032

Uterine malignancies

E³ 2032-1
Chairperson's introduction
B. Gui; Rome/IT

Learning Objectives:
1. To present a comprehensive overview on the surgical and oncologic management of uterine tumours.
2. To recognise what the clinician wants to know from the radiologist.
3. To discuss the role of CT, PET/CT, and MRI in endometrial and cervical cancer, taking into account the current guidelines of medical societies and presenting an outlook to the future.
4. To review the current and future role of standardised reporting and artificial intelligence for characterisation, staging, and follow-up of uterine tumours.

E³ 2032-2
The role of CT, PET/CT, and MRI in endometrial cancer
T. M. Cunha; Lisbon/PT
(tmargarida@gmail.com)

Learning Objectives:
1. To describe the optimal imaging techniques and imaging findings of endometrial cancer.
2. To discuss the role of CT, PET/CT, and MRI in endometrial cancer staging, taking the current guidelines into account.
3. To understand the impact of imaging in the treatment decision.

E³ 2032-3
The role of CT, PET/CT, and MRI in cervical cancer
M. Otero García; Vigo/ES
(milagros.otero.garcia@sergas.es)

Learning Objectives:
1. To learn about the indications of multimodality imaging for cervical cancer.
2. To discuss the value of multimodality imaging in the primary staging and evaluation of tumour recurrence.
3. To review the value of CT and PET/CT in facilitating decision-making and radiation treatment planning, treatment response, and prognosis.

E³ 2032-4
The current and future role of standardised reporting and artificial intelligence (AI) in imaging uterine malignancies
O. F. Donati; Zurich/CH

Learning Objectives:
1. To define standardised and structured reporting in general.
2. To review standardised reporting for the characterisation, staging, and follow-up of uterine tumours according to current recommendations.
3. To review the current and future applications of AI in the segmentation and evaluation of the uterus and uterine tumours.

E³ 2032-5
Multidisciplinary tumour board: case-based panel discussion
C. Panico; Rome/IT
(camilla.panico@guest.policlinicogemelli.it)

14:00-15:30 **Room D**

E³ - Young ECR Programme: Basic Sessions

Organised by the EFRS

BS 20

Raising awareness of justification issues to promote best practice

Moderator
G. Paulo; Coimbra/PT

BS 20-2
Current legislation and justification guidelines
S. J. Foley; Dublin/IE
(shane.foley@ucd.ie)

Learning Objectives:
1. To understand the current legislative requirements across Europe.
2. To consider the role of radiographers in justification.
3. To review evidence-based guidelines for justification.

BS 20-3
Enhancing radiographers' knowledge for projection radiography justification
M. Cauchi; Birkirkara/MT
(mar.cauchi@gmail.com)

Learning Objectives:
1. To understand the factors involved in justification.
2. To discuss the importance of effective communication for justification and cooperation purposes.
3. To outline how to manage problematic referrals.
Author Disclosures:
Maria Cauchi: Author: Maria Cauchi; Speaker: Maria Cauchi

BS 20-4
Enhancing radiographers' knowledge for computed tomography justification
M. Harris; Bradford/UK

Learning Objectives:
1. To outline the importance of understanding terminology and the clinical question.
2. To discuss when alternative modalities are more appropriate.
3. To discuss how to manage evolving clinical scenarios within a multidisciplinary team.

Panel discussion: Is further training required to optimise justification roles?

14:00-15:30 **Room E2**

State of the Art Symposium

SA 20
Acute stroke in the emergency department

SA 20-1
Chairperson's introduction
G. Mair; Edinburgh/UK
(grant.mair@ed.ac.uk)
Author Disclosures:
Grant Mair: Research Grant/Support: Stroke Association; Speaker: Canon Medical

SA 20-2
Acute stroke: CT first?
G. Mair; Edinburgh/UK
(grant.mair@ed.ac.uk)

Learning Objectives:
1. To understand the clinical and basic imaging criteria when selecting stroke patients.
2. To analyse the update guidelines in stroke treatment and the role of CT in the Hub and Spoke centre.
3. To describe how CTA and CT-perfusion can select patients.
Author Disclosures:
Grant Mair: Research Grant/Support: Stroke Association; Speaker: Canon Medical

SA 20-3
Acute stroke: MRI first?
C. Oppenheim; Paris/FR
(c.oppenheim@ghu-paris.fr)

Learning Objectives:
1. To describe which MRI protocol is necessary to perform in acute stroke patients.
2. To identify when it is mandatory to perform MRI examinations.
3. To demonstrate how MRI can help in including or excluding patients from intravenous and/or endovascular treatment.

SA 20-4
Strategies to reduce door-to-needle time: the clinician's point of view
N. Sanda; Geneva/CH
(Nicolae.Sanda@hcuge.ch)

Learning Objectives:
1. To clarify how to organise the pre-hospital setting.
2. To describe the best intra-hospital setting.
3. To discuss going directly to the angio suite: is it realistic?

Panel discussion: What radiologists need to know about the clinician's expectations from radiology in acute stroke?

14:00-15:30 **Room G**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 2019
Coronary artery disease: a multidisciplinary approach

E³ 2019-1
Chairperson's introduction
M. Dewey; Berlin/DE

Learning Objectives:
1. To interpret diagnostic imaging findings in coronary artery CT.
2. To understand how information from imaging impacts treatment choice.
3. To suggest additional imaging (e.g., ultrasound-guided biopsy of the larynx) in challenging clinical situations.
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

E³ 2019-2
CT for imaging of coronary artery disease: three cases
E. Zimmermann; Berlin/DE
(elke.zimmermann@charite.de)
F. Biavati; Berlin/DE
Author Disclosures:
Federico Biavati: Other: Funding for my MD/PhD from the German Research Foundation (DFG) through the BIOQIC research training group.

E³ 2019-3
Interventional approaches to coronary artery disease in relation to the three cases presented
U. Landmesser; Berlin/DE
Author Disclosures:
Ulf Landmesser: Research Grant/Support: Amgen, Novartis, Bayer; Speaker: Novartis, Abbott, NovoNordisk, Bayer, Amgen, DaiichiSankyo, Pfizer, Sanofi, AstraZeneca, Boston Scientific, Boeringer Ingelheim, Amarin

E³ 2019-4
Surgical approaches to coronary artery disease in relation to the three cases presented
T. Doenst; Jena/DE

E³ 2019-5
Multidisciplinary heart team: case-based panel discussion
M. Dewey; Berlin/DE
(marc.dewey@charite.de)
Author Disclosures:
Marc Dewey: Author: Prof. Marc Dewey

14:00-15:30 **Room K**

E³ - Advanced Courses: Lung, Mediastinum and Pleural Imaging

E³ 2031
Subsolid lung nodules: the integrated approach

E³ 2031-1
Chairperson's introduction
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)

Learning Objectives:
1. To classify subsolid nodules as pure ground glass or part-solid nodules.
2. To integrate management guidelines.
3. To understand the overdiagnosis risk.
Author Disclosures:
Mathias Prokop: Grant recepient: Siemens, Canon; Speaker: Siemens, Canon, Bracco

E³ 2031-2
Morphological approach to subsolid lung nodules: correlation with pathology
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)

Learning Objectives:
1. To understand how the microscopic findings in subsolid nodules translate into CT findings.
2. To understand how CT technology affects the correlation between microscopic and macroscopic findings.
3. To learn how far morphologic features predict benign disease and invasiveness in malignant nodules.
Author Disclosures:
Mathias Prokop: Grant recepient: Siemens, Canon; Speaker: Siemens, Canon, Bracco

E³ 2031-3
When to intervene
M. Silva; Parma/IT

Learning Objectives:
1. To review the key findings for the characterisation of subsolid nodule at first detection.
2. To review the morphological evolution of subsolid nodules toward a potentially aggressive disease.
3. To understand the critical issues of active surveillance of subsolid nodules.

E³ 2031-4
How to manage subsolid nodules: the surgeon's perspective
D. Gossot; Paris/FR
(dominique.gossot@imm.fr)

Learning Objectives:
1. To understand the evolving surgical management of subsolid nodules based on current trials.
2. To understand the technical and oncological issues of the closed chest approach.
3. To understand the new imaging modalities required by this surgery.

E³ 2031-5
Multidisciplinary tumour board: case-based panel discussion
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)
Author Disclosures:
Mathias Prokop: Grant recepient: Siemens, Canon; Speaker: Siemens, Canon, Bracco

14:00-15:30 **Room N**

Special Focus Session

SF 20
After the hype: the practical aspects of artificial intelligence

SF 20-1
Chairperson's introduction
L. S. Fournier; Paris/FR
Author Disclosures:
Laure S. Fournier: Grant recepient: Bristol Myers Squibb; Research Grant/Support: Philips, Evolucare, ArianaPharma; Speaker: Bayer, Novartis, Janssen, Sanofi, GE Healthcare

SF 20-2
Open-source tools for the non-expert radiologist
G. Chassagnon; Paris/FR
(gchassagnon@gmail.com)

Learning Objectives:
1. To define languages, softwares, and libraries.
2. To explain how to start programming and which educational resources are best adapted to radiologists.
3. To review simple projects with which to start artificial intelligence research.

SF 20-4
Developing methodology for quality assurance in machine learning
L. Maier-Hein; Heidelberg/DE

Learning Objectives:
1. To explain which issues may impact the quality of output of machine learning-based tools.
2. To define strategies to control results of machine learning algorithms.
3. To illustrate which new approaches may be used for quality assurance in machine learning-based imaging tools.

SF 20-5
What do the neighbours do and how can we collaborate: machine learning in pathology
P. J. van Diest; Utrecht/NL
(P.J.vanDiest@umcutrecht.nl)

Learning Objectives:
1. To illustrate the clinical applications of artificial intelligence tools in pathology.
2. To define low-hanging fruits versus major pitfalls for artificial intelligence in pathology.
3. To demonstrate common fields of research between pathology and radiology.
Author Disclosures:
Paul J. van Diest: Advisory Board: Sectra and Paige; Research Grant/Support: Proscia, Pfizer

Panel discussion: From hype to practical: what's next for artificial intelligence?

14:00-15:30 **Room O**

Professional Challenges Session

PC 20
EU policy on cancer screening

PC 20-1
Chairpersons' introduction
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
C. J. Herold; Vienna/AT

PC 20-2
The EU perspective
G. Ricciardi; Rome/IT

Learning Objectives:
1. To learn about the screening recommendations of the EU mission board for cancer.
2. To understand what measures should be taken at the EU level to harmonise access to screening programmes across member states.

PC 20-3
Breast screening in the EU
R. M. Pijnappel; Utrecht/NL
(r.m.pijnappel@umcutrecht.nl)

Learning Objectives:
1. To learn about the overview of breast screening programmes across Europe.
2. To understand the new effective screening modalities and their evidence.
3. To learn whether artificial intelligence and digitalisation will impact breast screening performance and uptake across Europe.
Author Disclosures:
Ruud M. Pijnappel: Research Grant/Support: Hologic, GE, Bayer

PC 20-4
Lung screening in the EU
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)

Learning Objectives:
1. To learn about the current evidence in lung cancer screening.
2. To understand the necessary requirements to obtain a reliable performance from lung screening radiologists.

3. To learn whether artificial intelligence and digitalisation will impact lung cancer screening and uptake across Europe.
Author Disclosures:
Marie-Pierre Revel: Speaker: GE Healthcare, Bracco, Chiesi, Boeringher-Ingelheim; Other: Expert annotation for GE Healthcare and Gleamer

Panel discussion: What can the ESR and radiology do to speed up and harmonise the uptake of breast and lung cancer screening across member states?

14:30-15:30 **Tech Gate Auditorium**

Patients in Focus

IF 20

How to prepare patients for their medical examination in order to optimise the workflow of the radiologist

Moderators
A. G. Rockall; London/UK
A. Brady; Cork/IE

IF 20-2
Humanising radiology via social media campaigns
P. Manchón; Barcelona/ES
(pmanchon@me.com)

Learning Objectives:
1. To understand how to provide great patient information by using illustrations on social media.
2. To learn how to reach the goal to humanise radiology and how to educate patients and prepare them for their medical examination to optimise the workflow of the radiologist.
3. To provide concrete examples of how this action is appreciated by patients and the effect it has on the work and life of the radiologist.

IF 20-3
Benefitting from new imaging implementations
A. G. Rockall; London/UK

Learning Objectives:
1. To learn how patients benefit from new imaging implementations and the main objectives of these innovations.
2. To appreciate that the patient is heard.

IF 20-4
All you need to know about your imaging test: how to make life easier for radiologists and patients
C. Justich; Vienna/AT
(cjustich@me.com)

Learning Objectives:
1. To inform about the survey of value in relation to radiology with results showing that patients feel that the provision of information provided could be improved – the better informed a patient is, the smoother the workflow for the radiologist and a better experience for the patient.
2. To learn why it is important to inform the patient what to expect and how this will optimise matters for the radiologist, regarding time management, on various levels.
3. To demonstrate how information regarding what to expect before, during, and after the examination can be provided in an easily understandable way to reach all patients and to minimise the language problem, enabling it to become an initiative to be used across national borders and help to create a standardised practice for the public.

Panel discussion: How can alternative approaches be used to improve the patient experience before and during imaging examinations?

16:00-17:00 **Open Forum #3 (ESR)**

Open Forum Session

Organised by ESR Publications Committee

OF 21a

How to get my manuscript accepted: getting help from reporting guidelines

OF 21a-1
Chairperson's introduction
Y. Menu; Paris/FR

OF 21a-2
Why are STARD and STROBE useful and how does it help authors and editors?
F. Sardanelli; San Donato Milanese/IT

Learning Objectives:
1. To learn about the definition of these guidelines.
2. To understand the major benefit of including these guidelines early in the study.
3. To be aware of other guidelines that may be useful for specific purposes, like CONSORT or ARRIVE.
Author Disclosures:
Francesco Sardanelli: Advisory Board: Bayer, Bracco, DeepTrace Technologies, General Electric; Equipment Support Recepient: General Electric; Research Grant/Support: Bayer, Bracco, General Electric; Speaker: Bayer, General Electric

OF 21a-3
What is PRISMA and what are the recipes for a relevant meta-analysis?
V. Wieske; Berlin/DE
(viktoria.wieske@charite.de)

Learning Objectives:
1. To understand the relationship between a systematic review and meta-analysis.
2. To become familiar with the PRISMA checklist and flow diagram and to understand how they can provide useful guidance for authors towards a successful meta-analysis.
3. To assess PRISMA as a tool for critical appraisal of published systematic reviews.

OF 21a-4
Can we elaborate guidelines or a check-list for radiomics studies?
D. Pinto dos Santos; Cologne/DE
(daniel.pinto-dos-santos@uk-koeln.de)

Learning Objectives:
1. To learn about the most common weaknesses in published and submitted manuscripts dealing with artificial intelligence and radiomics.
2. To understand how reporting guidelines can help authors avoiding these errors by providing a checklist.
3. To be aware of ongoing efforts in adapting reporting guidelines to the field of artificial intelligence.
Author Disclosures:
Daniel Pinto dos Santos: Advisory Board: cook medical; Speaker: Bayer

Open forum discussion

16:00-17:00 **Open Forum #4 (ESR)**

Joint Session of the ESR and EIBALL Subcommittee

ESR/EIBALL

Imaging biomarkers: lessons learned by/from QIBA and EIBALL

Moderator
A. van der Lugt; Rotterdam/NL

ESR/EIBALL-2
QIBA's metrology for technical evaluation of biomarkers
G. Zahlmann; Oak Brook, IL/US

Learning Objectives:
1. To learn about the Quantitative Imaging Biomarker Alliance (QIBA).
2. To appreciate the relevance of technical validation of imaging biomarkers.
3. To understand problems related to the assessment of imaging biomarker performance.

ESR/EIBALL-3
QIBA/EIBALL's experience with biomarker profile development
X. Golay; London/UK

Learning Objectives:
1. To learn about the different steps in profile development.
2. To appreciate the relevance of biomarker profiles.
3. To learn how you can contribute to biomarker development.
Author Disclosures:
Xavier Golay: Board Member: Gold Standard Phantoms; CEO: Gold Standard Phantoms; Founder: Gold Standard Phantoms; Patent Holder: Gold Standard Phantoms; Share Holder: Gold Standard Phantoms

ESR/EIBALL-4
Validation of biomarkers
M. Smits; Rotterdam/NL
(marion.smits@erasmusmc.nl)

Learning Objectives:
1. To learn about the clinical need of imaging biomarkers.
2. To appreciate the relevance of clinical validation.
3. To understand the different steps needed for validations and its hurdles.
Author Disclosures:
Marion Smits: Speaker: GE Healthcare, Auntminnie

Panel discussion: Are we on the right track with imaging biomarker validation?

16:00-17:00 **Room C**

Refresher Course: Vascular

RC 2115

Pros and Cons: Femoral Doppler ultrasound should still be a standard radiological exam

RC 2115-1
Chairperson's introduction
B. Brkljačić; Zagreb/HR

RC 2115-2
PRO
P. Lucatelli; Rome/IT
(pierleone.lucatelli@gmail.com)

Learning Objectives:
This house believes that femoral Doppler ultrasound should still be a standard radiological exam.

RC 2115-3
CON
D. L. Tarnoki; Budapest/HU
(tarnoki4@gmail.com)

Learning Objectives:
This house believes that femoral Doppler ultrasound should NOT still be a standard radiological exam.

Panel discussion: How should ultrasound be incorporated in the radiological work-up?

16:00-17:00 **Room D**

Transatlantic Course of ESR and RSNA (Radiological Society of North America): Breast Cancer Imaging

TC 21

New techniques in breast imaging

Moderators
L. Moy; New York, NY/US
M. H. Fuchsjäger; Graz/AT

TC 21-2
A. 3D automated breast ultrasound (ABUS)
A. Vourtsis; Athens/GR

Learning Objectives:
1. To describe the role of ABUS as a supplemental screening tool in women with dense breasts.
2. To review the advanced strategies for optimising image quality and enhancing implementation.
3. To become familiar with image interpretation and present tips to distinguish real findings from artefacts.
4. To apply artificial intelligence methods to ABUS to increase efficiency and improve accuracy.
Author Disclosures:
Athina Vourtsis: Advisory Board: Noncorporate Member of Medical Advisory Board of Volpara Solutions,Research, collaboration with ScreenPoint Medical B.V. company, Research collaboration with QVCA company, Consultant at GE and and Educator for ABUS Received grant from GE Precision Healthcare LLC

TC 21-3
B. Abbreviated breast MRI
E. A. Morris; Sacramento, CA/US
(eamorris@ucdavis.edu)

Learning Objectives:
1. To understand the difference in techniques between historical standard breast MRI and newer techniques.
2. To recognise where the different techniques may be used clinically to reduce false positives.
3. To understand the limitations of contrast-based techniques in detecting of breast cancer.

TC 21-4
C. Interactive case discussion
A. Vourtsis; Athens/GR
E. A. Morris; Sacramento, CA/US
(eamorris@ucdavis.edu)

Learning Objectives:
1. To demonstrate the contribution of multiplanar ABUS images in detecting of breast abnormalities.
2. To highlight the value of standardised 3D ABUS imaging in BI-RADS assessment of breast lesions.
3. To become familiar with unique ABUS artefacts and how to distinguish them from breast findings.
Author Disclosures:
Athina Vourtsis: Advisory Board: Noncorporate Member of Medical Advisory Board of Volpara Solutions,Research, collaboration with ScreenPoint Medical B.V. company, Research collaboration with QVCA company, Consultant at GE and and Educator for ABUS Received grant from GE Precision Healthcare

16:00-17:00 **Room E2**

Refresher Course: Neuro

RC 2111

Neuroimaging: normal or abnormal?

RC 2111-1
Chairperson's introduction
S. Haller; Geneva/CH
(sven.haller@gmail.com)
Author Disclosures:
Sven Haller: Advisory Board: EPAD imaging

RC 2111-2
Common mistakes in neuroimaging
J. Van Goethem; Antwerp/BE
(johan.vangoethem@uantwerpen.be)

Learning Objectives:
1. To learn about some of the most common diagnostic mistakes in neuroradiology.
2. To identify normal variants in neuroradiology.
3. To differentiate normal variants from pathology.
Author Disclosures:
Johan van Goethem: Advisory Board: SmartSOft

RC 2111-3
Normal ageing and imaging of the elderly versus neurodegenerative disorders
M. Vernooij; Rotterdam/NL
(m.vernooij@erasmusmc.nl)

Learning Objectives:
1. To discuss the imaging hallmarks of normal brain ageing.
2. To highlight how knowledge of normal brain ageing on imaging can inform on and improve the assessment of neurodegeneration.
3. To demonstrate developments in this domain, such as artificial intelligence, that may influence clinical practice.

RC 2111-4
Vessel wall imaging
H. R. Jäger; London/UK
(r.jager@ucl.ac.uk)

Learning Objectives:
1. To acquire knowledge about different vessel wall imaging techniques.
2. To distinguish pathological vessel wall enhancement from normal enhancement of the vasa vasorum and cerebral veins.
3. To become familiar with different patterns of vessel wall enhancement in inflammatory and non-inflammatory cerebrovascular diseases.

Panel discussion: Use of artificial intelligence to discriminate normal from abnormal exams

16:00-17:00 **Room G**

Refresher Course: Abdominal Viscera

RC 2101

Pros and Cons: MRI/PET is ready for clinical practice

RC 2101-1
Chairperson's introduction
K. Riklund; Umea/SE
(katrine.riklund@umu.se)
Author Disclosures:
Katrine Riklund: Advisory Board: University of Nottingham Imaging External Advisory Board,; Board Member: Dicom Port AB, Collective Minds Radiology AB

RC 2101-2
PRO
L. K. Blomqvist; Stockholm/SE

Learning Objectives:
This house believes that MRI/PET is ready for clinical practice.
Author Disclosures:
Lennart K. Blomqvist: Founder: Collective Minds Radiology; Share Holder: Collective Minds Radiology

RC 2101-3
CON
B. M. Fischer; London/UK
(Malene.fischer@kcl.ac.uk)

Learning Objectives:
This house believes that MRI/PET is NOT ready for clinical practice.

Panel discussion: Can MRI/PET outperform PET/CT? How to build strong interactions with nuclear medicine colleagues?

16:00-17:00 **Tech Gate Auditorium**

Patients in Focus

IF 21

Virtueller Besuch in der Radiologischen Abteilung: alles, was Sie schon immer über Radiologie wissen wollten

IF 21-1
Einführung des Vorsitzenden
C. Loewe; Vienna/AT
(christian.loewe@meduniwien.ac.at)

Learning Objectives:
Dieser Vortrag richtet sich an die Bevölkerung in Wien. Ziel des Vortrags ist es, interessierten Patient/innen auf teilweise einfache Fragen, die jedoch Ängste oder Unsicherheiten auslösen können, Antworten zu geben. Die Radiolog/innen haben zudem die Möglichkeit, anhand der gestellten Fragen weitere Informationen über häufige Probleme oder Sorgen der Patient/innen zu erhalten. Dieser Vortrag wird in deutscher Sprache abgehalten.
Author Disclosures:
Christian Loewe: Speaker: GE Healthcare; Siemens Healthineers

IF 21-2
Innerhalb einer Radiologie Abteilung

IF 21-3
Live Q&A
M. H. Fuchsjäger; Graz/AT
(michael.fuchsjaeger@medunigraz.at)
W. Schima; Vienna/AT
(wolfgang.schima@khgh.at)
E. Talakić; Graz/AT
(emina.talakic@medunigraz.at)

IF 21-4
Schlussworte
E. Briers; Hasselt/BE
(erikbriers@telenet.be)
C. Justich; Vienna/AT
(cjustich@me.com)

16:00-17:30 **Open Forum #2 (Young ECR)**

E³ - Young ECR Programme: Students Session

S 21

Best of ESR Student Abstract Submission 2

Moderator
M. Szczerbo-Trojanowska; Lublin/PL

S 21-2

Extracurricular hands-on POCUS workshops - a foundation for improved clinical skills in future medical doctors

J. Bosanac, P. Šter, G. Markoski; Ljubljana/SI
(jure@finet.si)

Purpose: Ultrafest is an educational project at the Faculty of Medicine in Ljubljana with 40 active student members. Our aim is to supply a substantial number of medical students with quality educational content in the field of Point-of-Care Ultrasound (POCUS), thereby complementing the university curriculum.
Methods or Background: We have developed a hands-on educational approach, which encompasses the organisation and execution of our all-day principal event titled Ultrafest. It is held biannually and it comprises 6 hands-on, each 1 hour long, POCUS workshops, including AAA/DVT, Lungs, FOCUS, Kidney and Gallbladder, FAST and Vascular access, performed by highly renowned clinical specialists of the respective fields. On each occasion, approximately 65 medical students from 2nd to 6th year of studies first participate in the lecture session, where they refresh their knowledge, priorly obtained from our literature. Subsequently, they are divided into groups of 7, which allows for an individualised approach. After each Ultrafest, participants receive a form via e-mail to self-evaluate their ultrasound skills before and after the workshops on a scale of 1 (poor skills) to 5 (excellent skills).
Results or Findings: Based on 128 responses, the average self-assessment score for confidence in performing POCUS examinations increased from 1.8 before to 3.7 after the event, thus demonstrating more than doubled confidence after participation in the workshops. Additionally, students gained motivation to further enrich their knowledge in emergency ultrasound due to its significant applicability in their future careers.
Conclusion: Ultrafest is a student-based project, which successfully provides practical education in sonography and POCUS for medical students and enriches their knowledge, acquired during the official courses. Evaluation has demonstrated that students' clinical skills generally benefit as a result of attending the ultrasound workshops.
Limitations: Not applicable.
Ethics committee approval: Not applicable.
Funding for this study: Not applicable.
Author Disclosures:
Jure Bosanac: Nothing to disclose
Petra Šter: Nothing to disclose
Gyoko Markoski: Nothing to disclose

S 21-3

Healthcare costs associated with suboptimal preoperative breast MRI use in breast cancer patients: a retrospective cost-of-illness study

A. C. Simmons, V. Mango, S. Sevilimedu Veeravalli, K. Pinker-Domenig, A. Mushlin, S. Eskreis-Winkler; New York, NY/US
(ambercsimmons@msn.com)

Purpose: To determine the medical costs of preoperative breast MRI overuse and underuse in breast cancer patients.
Methods or Background: Breast cancer patients presenting to our institution between 2008-2020, whose treatment included partial mastectomy and were given suboptimal breast MRI prior to surgery, were included in this study. Suboptimal breast MRI use was identified as either "overuse" or "underuse" based on radiological findings and/or biopsy pathology. MRI overuse was defined as (1) patients with new suspicious findings on MRI, which were biopsied yielding benign pathology, proceeding to partial mastectomy with negative surgical margins or (2) patients with no new suspicious findings on MRI, proceeding to partial mastectomy with negative surgical margins. MRI underuse was defined as patients with no MRI, partial mastectomy with positive surgical margins, and requiring surgical re-excision. Direct costs (contrast-enhanced bilateral breast MRI) and indirect costs (additional imaging, image-guided biopsies, surgical re-excision, and office visits) for each case was estimated using 2020 Medicare reimbursement rates and analyzed with descriptive statistics.
Results or Findings: Of 2,430 eligible patients, 1,763 patients (73%) had MRI overuse and 667 patients (27%) had MRI underuse. Total costs per overuse patient were $3,313.40 (with biopsy) and $2,143.01 (without biopsy), for underuse patients costs totaled $2,594.14. Total costs per patient with optimal MRI use were $1,739.17 for overuse patients and $2,143.01 for underuse patients, which would result in a $1.2 million cost reduction over a 13-year period.
Conclusion: Our results demonstrate the unmet need to improve how patients are triaged to preoperative breast MRI to decrease medical costs and improve health outcomes.
Limitations: Retrospective single-institution study that considered Medicare reimbursement rates only and excluded out-of-pocket and private insurance costs.
Ethics committee approval: Institutional IRB-approved.
Funding for this study: CCNY-MSK Partnership for Cancer Research, Education, and Community Outreach Grant.
Author Disclosures:
Katja Pinker-Domenig: Nothing to disclose
Amber Catheryn Simmons: Nothing to disclose
Srinivasa Sevilimedu Veeravalli: Nothing to disclose
Alvin Mushlin: Nothing to disclose
Victoria Mango: Nothing to disclose
Sarah Eskreis-Winkler: Nothing to disclose

S 21-4

Assessing the impact of 3D segmentation workshops on medical education and image interpretation: A prospective pilot study

C. Chan[1], P. S. Marway[2], M-R. Jinga[1], R. B. Y. Lee[3], B. K. M. Lee[3], K. Nandapalan[1], S. Y. Beh[4], H. Carr[5], C. Kui[1]; [1]Newcastle upon Tyne/UK, [2]Westcliff-on-Sea/UK, [3]London/UK, [4]Johor/MY, [5]Middlesbrough/UK
(cyrusklc@gmail.com)

Purpose: Despite the increasing prominence of 3D printing in medical education, there is a lack of formal educational resources. This pilot study aims to assess implementation of 3D segmentation workshops on image interpreting ability, anatomical understanding, and benefits of this technology within medical education.
Methods or Background: 33 participants were recruited from four UK universities for two-day workshops between September 2020 and September 2021. Through online interactive small-group teaching, participants practised segmentation of 3D vertebral models from open-source software and CT images. Participants completed pre- and post-workshop surveys, scoring from 1 (low) - 5 (high) to assess A: confidence in interpreting CT scans and anatomical understanding, B: confidence in interacting with 3D printing technology, and C: perceived utility of 3D printing software in medical education.
Results or Findings: 33 questionnaires pre-workshop and 24 post-workshop were received. Two-tailed t-test was used to compare mean scores. Pre- to post-workshop, confidence in interpreting CT scans (2.36 to 3.13, $p = 0.010$) and interacting with 3D printing technology (2.15 to 3.33, $p = 0.00053$) showed significant increases. Perceived utility of creating 3D models to aid image interpretation (4.18 to 4.45, $p = 0.0027$), improving anatomical understanding (4.2 to 4.7, $p = 0.0018$), and utility in medical education (4.45 to 4.79, $p=0.077$) also showed increases.
Conclusion: Our nationally piloted 3D segmentation workshops showed statistically significant improvements in CT interpretation confidence and knowledge of 3D printing technology, validating existing literature for its utility within medical education.
Limitations: This study is limited by the self-selection bias of survey respondents, which may not represent all healthcare professionals. The inclusion of objective attainment data would enable better quantification. Future studies could investigate the use of 3D-printed models on anatomical appreciation alongside the segmentation process.
Ethics committee approval: Written Consent
Funding for this study: N/A
Author Disclosures:
Maria-Ruxandra Jinga: Nothing to disclose
Krishan Nandapalan: Nothing to disclose
Cyrus Chan: Nothing to disclose
Prabhvir Singh Marway: Nothing to disclose
Christopher Kui: Nothing to disclose
Sze Yi Beh: Nothing to disclose
Harry Carr: Nothing to disclose
Bok Kit Matthew Lee: Nothing to disclose
Rachel Bok Ying Lee: Nothing to disclose

S 21-5

Audit of the consent process in interventional radiology and patient perspectives

I. F. Sulevani, B. Gurung, J. Zhong, C. J. Hammond, O. Hulson; Leeds/UK
(ll16i2s@leeds.ac.uk)

Purpose: The current guidance on pre-procedural consent from the General Medical Council recommends a two-stage process. In many interventional radiology (IR) departments, patients are consented on the same day of their procedure, often immediately prior to their procedure, in breach of GMC guidance. The aim of this two-cycle audit was to evaluate patients' perspectives on consenting processes in an IR department.
Methods or Background: A prospective audit was carried out between December – March 2016 (cycle 1), and March – August 2021 (cycle 2). Patients were invited to complete a questionnaire after they were consented for IR procedures (angiographic and US guided interventions). Patients self-rated their understanding of the procedure and its risks and benefits before- and after consent on a Likert scale from 0 (no understanding) to 5 (full understanding). Patients also rated their overall satisfaction level with the consent process and were asked their preferences for additional face-to-face or virtual consenting appointment pre-procedure.

Results or Findings: A total of 345 questionnaires were completed: 194 patients in cycle 1 and 151 in cycle 2. The median age of patients was 63 years (range: 21-83). 222 patients (64%) were undergoing the procedure for the first time. Overall, patients felt that they had enough time to weigh up risks (90%, n=312/345), did not receive information during consent that they were unaware of beforehand (65%, n=223/345) and were satisfied with the consent process (92%, n=316/345). Most of the patients did not desire a separate consent appointment pre-procedure (89%, n=134/154).
Conclusion: Despite clinicians' concerns and GMC guidance, the majority of patients feel the current consent processes are satisfactory and do not want an additional consultation for consenting.
Limitations: N/A
Ethics committee approval: N/A
Funding for this study: N/A
Author Disclosures:
Christopher J Hammond: Nothing to disclose
Oliver Hulson: Nothing to disclose
Iman Ferman Sulevani: Nothing to disclose
Jim Zhong: Nothing to disclose
Bipima Gurung: Nothing to disclose

S 21-6

Does the performance of Deep Learning-based cardiac segmentation on cardiac MR differ with regard to cardiac pathology?
M. N. Gökbak, Z. Akkan Çiçek, S. Erdemli, H. Şener, B. Ay, M. Yergin, I. Oksuz, D. Alis, E. Karaarslan; Istanbul/TR
(mervegokbak@gmail.com)

Purpose: Deep learning (DL) is performant in segmenting cardiac structures on cardiac MR, yet little evidence exists regarding its performance concerning the underlying pathology. We investigated whether DL's segmentation performance differs regarding underlying cardiac pathology.
Methods or Background: We used a publicly available fully convolutional DL model trained on the UK Biobank. The performance estimation was made on the publicly available dataset of Automated Cardiac Diagnosis Challenge covering five different categories: 20 healthy controls; 20 patients with hypertrophic cardiomyopathy (HCM); 20 with dilated cardiomyopathy (DCM) patients; 20 with chronic myocardial ischemia; and 20 with an abnormal right ventricle. The DL model segmented the left ventricular (LV) cavity, right ventricular (RV) cavity, and the myocardium. We compared the ground-truth and the model's masks using the Dice Similarity Score, ranging from 0 to 1 (no/perfect overlap). The Kruskal-Wallis H-test test was used to investigate whether there was any difference in segmentation performance of the DL model concerning the cardiac pathology.
Results or Findings: The DL model yielded a median Dice score of 0.88 (IQR, 0.13), 0.80 (IQR, 0.23), and 0.75 (IQR, 0.17) for the LV, RV, and the myocardium, respectively. Notably, there were significant differences in the median Dice Scores ($P<0.0001$, $P = 0.0003$ and 0.04). The median Dice Scores were highest for healthy subjects, whereas the worse scores were obtained for patients with chronic myocardial ischemia and an abnormal RV.
Conclusion: The performance of DL in segmenting cardiac structures could vary concerning different cardiac pathologies; This a priori knowledge might be beneficial in detecting patients in whom there might be a need for editing the DL-based cardiac segmentations.
Limitations: The testing set was from a single MR manufacturer.
Ethics committee approval: We used publicly available materials.
Funding for this study: TUBITAK (Project No: 118C353)
Author Disclosures:
Beril Ay: Nothing to disclose
Ilkay Oksuz: Nothing to disclose
Servet Erdemli: Nothing to disclose
Deniz Alis: Nothing to disclose
Merve Nida Gökbak: Nothing to disclose
Ercan Karaarslan: Nothing to disclose
Zülal Akkan Çiçek: Nothing to disclose
Hasan Şener: Nothing to disclose
Mert Yergin: Nothing to disclose

S 21-7

"RadioComics" – Use Of Creativity To Teach Radiology
G. F. Saffe, C. V. Souza Freire, M. E. Rodrigues de Araújo Dantas de Pinho, M. E. B. De Siervi, C. Freitas Lins; Salvador/BR
(gabrielasaffe17.2@bahiana.edu.br)

Purpose: To describe the perception of medical students about the use of comics as a creative method for teaching Radiology.
Methods or Background: This is a cross sectional study with 3rd semester's students of a medical school. "RadioComics" were developed by undergraduate teaching assistants of Radiological Anatomy guided by a radiologist through Pixton® platform. They addressed clinical cases and radiological exams' indications and were posted on the radiological anatomy department's Instagram profile. After a semester, the students were invited to answer a questionnaire based on Likert Scale. Incomplete questionnaires were excluded, and informed consent was obtained from all participants. Alfa Cronbach analyses was applied to evaluate question's reliability, values equal to/or above 0.7 were considered acceptable.
Results or Findings: The questionnaire was answered by 148 students, whose 90% considered the didactics and 98% the clarity of RadioComics between average and excelente, demonstrating a high level of quality. 83% rated the level of interest in RadioComics between average and excellent and 78% considered that they had a high level of learning achievement, which demonstrates that creativity can seduce and encourage students to learn Radiology. Furthermore, 86% and 75%, respectively, considered between average and excellent how much the use of RadioComics will help medical practice and how much it helped in the academic tests' performance. Cronbach's alpha was 0.925, showing a high degree of internal consistency.
Conclusion: Comics as a method of teaching are configured as creative resource that can be a facilitator in the curricular insertion of Radiology and its use can be expanded.
Limitations: This is a cross-sectional study, further investigation would be required.
Ethics committee approval: Ethical approval was obtained from Ethics Committee of our educational institution (CAAE: 28196820.6.0000.5544).
Funding for this study: This research received no external funding.
Author Disclosures:
Gabriela Fagundes Saffe: Nothing to disclose
Maria Eduarda Rodrigues de Araújo Dantas de Pinho: Nothing to disclose
Maria Eduarda Barreto De Siervi: Nothing to disclose
Carolina Freitas Lins: Nothing to disclose
Camila Verônica Souza Freire: Nothing to disclose

S 21-8

Evaluable self-learning of ultrasound by simulation in students at the beginning of the studies of Degree in Medicine with integrated curriculum.
P. Urbiola Sáez[1], A. Sayés Chueca[2], S. González Fernández[3], C. Urtasun Iriarte[4], M. B. Barrio Piqueras[4], J. Pueyo Villoslada[4]; [1]Tudela/ES, [2]Pamplona/ES, [3]León/ES, [4]PAMPLONA/ES
(urbiolapedro@gmail.com)

Purpose: The objective of this study is to design a self-learning protocol based on simulators and peer training so that medical students can acquire the necessary basic knowledge and perform an abdominal ultrasound scan by themselves, with minimal help from teachers.
Methods or Background: 42 second-year medical students were selected from a random sample and paired in groups of two people. Each group watched two videos: one explaining the most basic concepts of ultrasound, and another on how to use simulators. Subsequently, the students had 1h30 to practice the exploratory technique with these simulators and one additional hour of practice with a real ultrasound with radiologists near them. After that, each student had to demonstrate their knowledge by performing an ultrasound scan on a standardized patient under the evaluation of two doctors. Throughout the protocol, the subjective impressions in acquisition of skills and personal satisfaction of the students were collected through different forms. Moreover, two exams were carried out, one at the beginning and one at the end, to be able to objectify the acquisition of knowledge.
Results or Findings: The students experienced a significant improvement in their knowledge, objectified in the comparison of their results in the exams: initial mean 6'25 vs final mean 8'025 ($p<0'05$). The average values obtained in terms of the difficulty of using the simulator were 5'33/10. The overall experience of the students obtained a score of 8'45/10. Finally, the utility given to the use of simulators for ultrasound learning was 9'31/10.
Conclusion: The use of simulators for the self-learning of ultrasound is very useful and can be a valid tool to ensure the knowledge and skills of students in relation to this exploratory technique.
Limitations: Sample size should have been larger.
Ethics committee approval: Yes.
Funding for this study: None.
Author Disclosures:
Cesar Urtasun Iriarte: Nothing to disclose
Miguel Barrio Barrio Piqueras: Nothing to disclose
Pedro Urbiola Sáez: Nothing to disclose
Jesus Pueyo Villoslada: Nothing to disclose
Alicia Sayés Chueca: Nothing to disclose
Sara González Fernández: Nothing to disclose

S 21-9
More than meets the eye: anemia CT signs
M. Mikalauskas, A. Tumėnas; Kaunas/LT
(Miglius.mikalauskas@gmail.com)

Purpose: Review the CT signs for predicting anemia
Methods or Background: WHO defines anemia as hemoglobin level less than 130 g/l for men and less than 120 g/l for women. Although it is easily diagnosed with simple blood test, there are also radiological signs to determine this condition. Incidental findings on CT scans may aid in detecting clinically relevant correlations.
Results or Findings: Chest CT may tell more. Literature shows that it is possible to predict anemia with unenhanced Chest CT in which evaluation of the heart's interventricular septum, aorta, aortic wall and the attenuation values of left ventricular cavity in Hounsfield Units (HU). These values were found to correlate with hemoglobin levels provided that CT is performed within 24 hours of taking the blood sample. Hyperdense interventricular septum visible on an unenhanced CT provide high sensitivity and specificity for detecting anemia. This finding is most prevalent in patients with severe anemia. Aortic ring sign is sensitive in detecting anemia, although it can be confused with intramural hematoma or aortic atherosclerosis. In the case of the poorly visualized interventricular septum, the density of left ventricular cavity and aortic lumen should be measured. There is a positive correlation between density and hemoglobin levels. Studies suggest that threshold of 35 HU correspond to hemoglobin level of 100 g/l and can be used to distinguish between anemic and non-anemic patients.
Conclusion: Unenhanced chest CT may add value in detecting anemia. Interventricular septum sign, aortic ring sign, attenuation values of left ventricular cavity and aortic lumen can be used for prediction of anemia. In order to achieve the best results it is suggested to correlate these findings with blood hemoglobin values.
Limitations: n/a
Ethics committee approval: n/a
Funding for this study: n/a
Author Disclosures:
Augustinas Tumėnas: Nothing to disclose
Miglius Mikalauskas: Nothing to disclose

S 21-10
An investigation of Irish radiographers' attitudes and opinions on taking on the role of referrers.
K. Davies; Prosperous, Kildare/IE

Purpose: Role extension in radiography has been an emergent topic for the last century. In January 2019, a BSS legislation was introduced giving Irish radiographers the ability to refer patients for radiological examinations.
Methods or Background: An online questionnaire was distributed to 154 basic and senior grade radiographers in regional and local/rural hospitals. It consisted of three sections; awareness of the legislation, opinions and attitudes towards the legislation and readiness to take on the role of referring.
Results or Findings: The study response rate was 31% (n=48). 56% of respondents were unaware of the incoming legislative change. 76% (n=38) were in agreement with the change in legislation. 58% (n=28) stated 'better workflow' as the main benefit of Irish radiographers becoming referrers. 'Medico-legal risks' were cited by 40% (n=19) and 27% (n=13) cited 'lack of training' as their main concerns with taking on a referring role. 67% (n=32) said they felt prepared to take on role of referring, with 83% (n=40) stating that they would require further training before taking on the role. Ongoing CPD was cited as the most suitable form of training by 44% (n=21).
Conclusion: Radiographers in Irish hospitals have a positive attitude towards taking on the role of referrers and are aware of the benefits to patient care. Concerns about medico-legal risks and lack of training were expressed. Attempts should be made to facilitate forms of training for Irish radiographers prior to the implementation of this legislation.
Limitations: The main study online questionnaire was distributed as quickly as possible to ensure an appropriate amount of time was allowed for two email reminders.
Ethics committee approval: An exemption from ethical approval was received from UREC and a research ethics reference number (UREC-SM-2018-38) was granted.
Funding for this study: N/A
Author Disclosures:
Keisha Davies: Nothing to disclose

S 21-11
The importance of distance learning (EAD) in the pandemic.
R. J. de Leao, A. Serpa, G. Rocha, A. Puchnick, L. Medeiros;
Sao Paulo/BR
(rogeriojadjiskideleao@gmail.com)

Purpose: Analyze the opinion of radiology residents in reference to online classes instead of face-to-face classes, in the current pandemic context.
Methods or Background: To carry out the data collection, an electronic questionnaire was created in Google Forms, using the Likert Scale. This is a descriptive cross-sectional study, in which radiology and diagnostic imaging residents from some institutions in the state of São Paulo recorded their responses. To assess the reliability of the answers to the questionnaire, the statistical test of Cronbach's alpha coefficient was used.
Results or Findings: The result of Cronbach's alpha coefficient was 0.8: a substantial internal consistency.All had or are taking classes through distance learning (EAD). When asked if the models of distance classes were better for learning than the traditional models, there was a slight preference for agreement (41.9%). Most respondents (70.9%) said they were less focused on online models. Regarding the habit of re-attended to past classes, 61.29% of residents re-attend past classes. The majority (74.19%) declared themselves satisfied with the teaching platforms. There was some agreement on the lower interaction between residents (74.1%) and between teacher-students (51.6%) during distance classes. Regarding distance learning classes, most residents agreed that there is greater flexibility in timetables (93.5%) and that they have more time to organize the study (80.6%).Regarding the future of distance learning classes, 83.8% believe that this model will remain after the pandemic and 45.1% agree that there will be a complete replacement of the traditional model.
Conclusion: Highlight the need for studies to assess its real impact on curriculum performance, including evaluating hybrid models for teaching.
Limitations: Few residents answered the questionnaire.
Ethics committee approval: The consent form was filed by the committee of ethics at the federal university of Sao Paulo.
Funding for this study: None.
Author Disclosures:
Gabriel Rocha: Nothing to disclose
Rogerio Jadjiski de Leao: Nothing to disclose
Lucas Medeiros: Nothing to disclose
Augusto Serpa: Nothing to disclose
Andrea Puchnick: Nothing to disclose

16:00-17:30 **Room A**

Junior Image Interpretation Quiz

JIIQ
The voyage of the Beagle

JIIQ-1
Introduction
R. M. Mann; Nijmegen/NL
(r.mann@rad.umcn.nl)
Author Disclosures:
Ritse M. Mann: Advisory Board: screen point, Siemens, bayer, bd

JIIQ-2
Team Marco Polo
N. Pötsch; Vienna/AT
M. Klontzas; Iraklion/GR

JIIQ-3
Team Vasco da Gama
G. Laimer; Innsbruck/AT
C. Guia Yerovi; Valencia/ES

JIIQ-4
Team Colombo
M. Polici; Rome/IT
H. D. Paixão; Lisbon/PT

16:00-17:30 **Room B**

E³ - Advanced Courses: Head and Neck Imaging

Jointly organised by the ESR and ESTRO

E³ 2122

Early laryngeal cancers: a multidisciplinary approach

E³ 2122-1
Chairperson's introduction
F. A. Pameijer; Utrecht/NL
(f.a.pameijer@umcutrecht.nl)

Learning Objectives:
1. To interpret diagnostic imaging findings in (small) laryngeal carcinomas.
2. To understand how information from imaging impacts treatment choice.
3. To suggest additional imaging (e.g., ultrasound-guided biopsy of the larynx) in challenging clinical situations.

E³ 2122-2
Imaging checklist for treatment planning in early laryngeal cancers
D. Farina; Brescia/IT
(davide.farina@unibs.it)

Learning Objectives:
1. To apply a dedicated CT and MRI protocol for imaging (early) laryngeal cancers.
2. To list findings indicative of deep tumour extension to the paraglottic and pre-epiglottic space.
3. To describe a step-by-step approach based on laryngeal anatomy during the analysis of CT and MRI studies in patients with early laryngeal cancer.

E³ 2122-3
Transoral microsurgery in early laryngeal cancers: benefits, limitations, and contraindications
C. Piazza; Brescia/IT
(cesare.piazza@unibs.it)

Learning Objectives:
1. To describe the technical requirements for transoral laser microsurgery (TLM) in early laryngeal cancer.
2. To interpret and describe anterior commissure involvement as a risk factor for TLM.
3. To compare the results of TLM and radiotherapy for early glottic cancers.

E³ 2122-4
Pre-treatment evaluation of early laryngeal cancers: a radiation oncologist's perspective
V. Gregoire; Lyon/FR
(vincent.gregoire@lyon.unicancer.fr)

Learning Objectives:
1. To describe the indications of radiotherapy for early laryngeal cancers.
2. To summarise the outcome of radiotherapy (efficacy and toxicity).
3. To discuss the technical challenges of laryngeal radiotherapy.

E³ 2122-5
Multidisciplinary tumour board: case-based panel discussion
F. A. Pameijer; Utrecht/NL
(f.a.pameijer@umcutrecht.nl)

16:00-17:30 **Room K**

E³ - Advanced Courses: Lung, Mediastinum and Pleural Imaging

E³ 2131

Neuroendocrine tumours of the lung: a multidisciplinary approach

E³ 2131-1
Chairperson's introduction
A. Snoeckx; Antwerp/BE
(Annemiek.Snoeckx@uza.be)

Learning Objectives:
1. To recognise the CT features of DIPNECH.
2. To identify the imaging features of different types of pulmonary neuroendocrine tumours.
3. To understand the therapeutic options for small cell lung cancer.
Author Disclosures:
Annemiek Snoeckx: Advisory Board: Agfa; Speaker: Samsung

E³ 2131-2
How to manage small cell lung cancer: the oncologist's view
D. Jovanovic; Belgrade/RS

Learning Objectives:
1. To understand the basics of small cell lung cancer.
2. To become familiar with systemic treatment.
3. To appreciate the role of immunotherapy in this disease.

E³ 2131-3
Imaging the spectrum of pulmonary neuroendocrine tumours
A. Snoeckx; Antwerp/BE
(Annemiek.Snoeckx@uza.be)

Learning Objectives:
1. To describe the histopathologic classification of pulmonary neuroendocrine tumours.
2. To discuss the role of CT and PET-CT for diagnosis and staging.
3. To illustrate the imaging characteristics of the spectrum of pulmonary neuroendocrine tumours.
4. To identify key imaging features that are important for differential diagnosis.
Author Disclosures:
Annemiek Snoeckx: Advisory Board: Agfa; Speaker: Samsung

E³ 2131-4
DIPNECH: a diagnostic challenge
G. Chassagnon; Paris/FR
(gchassagnon@gmail.com)

Learning Objectives:
1. To become familiar with the clinical features of DIPNECH.
2. To be able to suggest this diagnosis in patients with multiple lung nodules.
3. To be aware of the long-term outcomes.

E³ 2131-5
Multidisciplinary tumour board: case-based panel discussion
A. Snoeckx; Antwerp/BE
(Annemiek.Snoeckx@uza.be)
Author Disclosures:
Annemiek Snoeckx: Advisory Board: Agfa; Speaker: Samsung

16:00-17:30 **Room M 4**

E³ - Advanced Courses: The Multidisciplinary Team (MDT)

E³ 2119

Anal cancer: a multidisciplinary approach

E³ 2119-1
Chairperson's introduction
M. J. Gollub; New York, NY/US

Learning Objectives:
1. To understand the strengths and weaknesses of MRI and PET/CT.
2. To be able to stage anal squamous cell cancer on MRI and PET/CT.
3. To understand the therapeutic options and how imaging informs/affects treatment.

E³ 2119-2
How to manage anal cancer: the radiation oncologist's perspective
R. Glynne-Jones; London/UK
(rob.glynnejones@nhs.net)
Author Disclosures:
Rob Glynne-Jones: Advisory Board: Incyte Corporation and Amgen; Speaker: Servie,r Johnson and Johnson; Other: Chief Medical Adviser Bowel Cancer UK

E³ 2119-3
Which imaging should I use to stage anal cancer
J. S. Golia Pernicka; New York, NY/US

E³ 2119-4
PET/CT baseline and follow up of anal cancer
S. Pötter-Lang; Vienna/AT

E³ 2119-5
Case-based panel discussion
M. J. Gollub; New York, NY/US
R. Glynne-Jones; London/UK
(rob.glynnejones@nhs.net)
J. S. Golia Pernicka; New York, NY/US
S. Pötter-Lang; Vienna/AT
M. A. Gambacorta; Rome/IT
(mariaantonietta.gambacorta@policlinicogemelli.it)
Author Disclosures:
Rob Glynne-Jones: Advisory Board: Incyte Corporation and Amgen; Speaker: Servie,r Johnson and Johnson; Other: Chief Medical Adviser Bowel Cancer UK

16:00-17:30 **Room N**

Special Focus Session

SF 21b

Artificial intelligence: where are we now?

SF 21b-1
Chairpersons' introduction
J. McNulty; Dublin/IE
S. Morozov; Liège/BE
Author Disclosures:
Sergey Morozov: Advisory Board: Philips, Agfa; Employee: Osimis; Speaker: Siemens

SF 21b-2
Guiding our practice: clinical decision support and examination supports
K. Knapp; Exeter/UK
(K.M.Knapp@exeter.ac.uk)

Learning Objectives:
1. To consider how artificial intelligence could support clinical decision making in the future.
2. To consider inclusive datasets in the development of artificial intelligence tools to support a wider implementation.
3. To consider how artificial intelligence can be implemented into patient pathways.

Author Disclosures:
Karen Knapp: Grant recepient: Siemens, Stryker, Royal Osteoporosis Society; Research Grant/Support: Siemens, Stryker, Royal Osteoporosis Society

SF 21b-3
Helping to improve patient outcomes
B. S. Kelly; Dublin/IE
(brendanskelly@me.com)

Learning Objectives:
1. To describe some of the current challenges and benefits of artificial intelligence.
2. To reflect on how artificial intelligence should be evaluated in a clinical setting though patient-focused outcomes.

SF 21b-4
Educating in an artificial intelligence world
C. Malamateniou; London/UK
(christina.malamateniou@city.ac.uk)

Learning Objectives:
1. To highlight the educational workforce requirements for digital healthcare delivery.
2. To explore the current practice of artificial intelligence educational initiatives for radiography.
3. To discuss future developments and recommendations for radiography educators and academics.
Author Disclosures:
Christina Malamateniou: Research Grant/Support: Siemens Healthineers, annalise.ai

Panel discussion: Is artificial intelligence improving our professional practice?

16:00-17:30 **Room O**

Special Focus Session

SF 21a

Functional renal imaging for the clinical practice

SF 21a-1
Chairperson's introduction
H. C. Thoeny; Fribourg/CH
(Harriet.thoeny@h-fr.ch)
Author Disclosures:
Harriet C. Thoeny: Advisory Board: Guerbet SA; Speaker: Guerbet

SF 21a-2
Added value of diffusion-weighted MRI
H. C. Thoeny; Fribourg/CH
(Harriet.thoeny@h-fr.ch)

Learning Objectives:
1. To understand the basic principles of diffusion-weighted imaging (DWI), including mono- and bi-exponential fitting.
2. To understand in which clinical context DWI provides additional information.
3. To learn to avoid the typical pitfalls in image interpretation of DWI.
Author Disclosures:
Harriet C. Thoeny: Advisory Board: Guerbet SA; Speaker: Guerbet SA

SF 21a-3
Added value of BOLD MRI
M. Pruijm; Lausanne/CH
(menno.pruijm@chuv.ch)

Learning Objectives:
1. To learn to describe which parameters and clinical conditions affect renal tissue oxygenation in humans.
2. To understand the basic principles and pitfalls in the acquisition and patient preparation of renal BOLD MRI.
3. To be able to describe 2-3 future clinical applications of renal BOLD MRI.
Author Disclosures:
Menno Pruijm: Advisory Board: Novo Nordisk, Antaros, Astellas, Gambro and Boehringer Ingelheim

SF 21a-4
Added value of ASL MRI
P. Eckerbom; Uppsala/SE
(per.eckerbom@akademiska.se)

Learning Objectives:
1. To understand the basic principles of arterial spin labelling (ASL) and how it is performed and interpreted.
2. To understand when ASL can be used, its advantages, its challenges, and what to expect from the results.
3. To provide some clinically relevant examples of the method and some possible future applications.

Panel discussion: What is the clinical impact of functional imaging of the kidney?

16:00-17:30 **Room X**

ESR QuADRANT Session

Jointly organised by the ESR Audit and Standards Subcommittee and EuroSafe Imaging

ESR QuADRANT

Quality improvement through audit in diagnostic radiology, radiotherapy, and nuclear medicine: a European project on behalf of the European Commission: a progress update

ESR QuADRANT-1
Chairperson's introduction
A. Brady; Cork/IE

ESR QuADRANT-2
QuADRANT: the main European survey, literature review, and expert interviews
D. C. Howlett; Eastbourne/UK
(david.howlett@nhs.net)

Learning Objectives:
1. To overview the key components of the third QuADRANT work package.
2. To present the findings of the main European survey in detail.
3. To consider the implications of this core package as part of the QuADRANT project.

ESR QuADRANT-3
QuADRANT: findings and output from the final workshop
F. Giammarile; Vienna/AT
(f.giammarile@gmail.com)

Learning Objectives:
1. To review the proceedings of the final QuADRANT workshop.
2. To highlight the key outcomes and summary findings from the workshop.
3. To consider how this workshop will contribute to the outcomes and recommendations provided to the European Commission.

ESR QuADRANT-4
The European Commission perspective
G. Simeonov; Luxembourg/LU
(georgi.simeonov@ec.europa.eu)

Learning Objectives:
1. To understand the background of the tender.
2. To appreciate the role and importance of clinical audit in enhancing patient care and outcomes.
3. To consider a way forward in clinical audit across Europe in light of QuADRANT.

ESR QuADRANT-5
QuADRANT: the radiological perspective
A. Brady; Cork/IE
(adrianbrady@me.com)

Learning Objectives:
1. To discuss the current challenges to clinical audit uptake in European imaging departments.
2. To give a radiological perspective on the QuADRANT project and outcomes.
3. To consider the role of the ESR and the national societies in implementing key QuADRANT recommendations.

Panel discussion: A roadmap for enhanced clinical audit integration into European radiological practice: are we any closer?

Sunday, July 17

08:00-09:00 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by EuroSafe Imaging

OF 22R

Medical radiation exposure in pregnancy

OF 22R-1
Chairperson's introduction
C. Granata; Genoa/IT

OF 22R-2
Common indications, justification, and optimisation of radiologic procedures during pregnancy
E. Sorantin; Graz/AT
(erich.sorantin@medunigraz.at)

Learning Objectives:
1. To appreciate the most common radiologic procedures performed in pregnant women.
2. To understand the peculiar aspects of justification of radiologic procedures.
3. To learn how to reduce conceptus exposure during radiologic procedures.

OF 22R-3
Medical irradiation and dose exposure to the conceptus
A. Trianni; Trento/IT
(annalisa.trianni@apss.tn.it)

Learning Objectives:
1. To appreciate the usual dose exposure to the conceptus for the most common radiologic procedures.
2. To learn about the radiation-related risks of health effects for the conceptus according to the developmental stage and dose exposure.
3. To understand how a qualified expert can make an estimate of the absorbed dose of the conceptus after an x-ray procedure.

OF 22R-4
Communicating the risk and benefit of medical irradiation to pregnant women
M. Murray; Glasgow/UK
(mariam@sor.org)

Learning Objectives:
1. To understand how the participation of pregnant women undergoing radiologic procedures can be emotional.
2. To appreciate what information pregnant women want when undergoing a radiologic procedure.
3. To learn how to communicate the risk and benefit of a radiologic procedure simply and clearly for the mother and the conceptus.

Open forum discussion

08:00-09:00 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 22Y

Help me to get it published

Moderators
R. Muglia; Bergamo/IT
M. Klontzas; Iraklion/GR

OF 22Y-1
Network analysis integrating microRNA expression profiling with MRI biomarkers and clinical data for prostate cancer early detection: a proof-of-concept study
M. Pecoraro, E. Messina, M. Bicchetti, M. Pisciotti, C. Catalano, V. Panebianco; Rome/IT
(pecoraro.martina1@gmail.com)

Purpose: MRI of the prostate is the gold-standard for the detection of clinically significant prostate cancer (csPCa). Nonetheless, MRI still misses around 11% of clinically significant disease. The aim was to comprehensively integrate tissue and circulating microRNA profiling, MRI biomarkers and clinical data to implement early detection.
Methods or Background: In this prospective cohort study 76 biopsy-naïve patients underwent MRI and MRI-directed biopsy. A sentinel sample of 15 patients was selected for a pilot molecular analysis. Weighted gene co-expression network analysis was applied to identify microRNAs drivers of csPCa. Mi-croRNA-target gene-interaction maps were constructed, and enrichment analysis performed. The ANOVA on ranks test was used. The diagnostic power of each miRNA was evaluated in terms of the ROC probability curve analysis.
Results or Findings: Disease status was associated with under-expression of the miRNA profiled; a correlation was found with ADC (r= -0.51, p=0.02) and normalised ADC values (r=-0.64, p=0.002). Overexpression of miRNAs from plasma was associated with csPCa (r=0.72; p=0.02), and with PI-RADS assessment score (r=0.73; p=0.02); a linear correlation was found with biomarkers of diffusion and perfusion. Among the 800 profiled microRNA, eleven were identified as to correlate with PCa, among which hsa-miR-548a-3p, miR-138-5p and has-miR-520d-3p were confirmed using the RT-qPCR approach on an additional validation cohort of ten subjects. ROC analysis showed an accuracy >90%.
Conclusion: Provided a validation of the identified microRNAs on a larger cohort, we propose a diagnostic paradigm shift that sees molecular data and MRI biomarkers as pre-biopsy triage of patients at risk for PCa. This approach will allow for accurate patient allocation to biopsy, and for stratification into risk-group categories.
Limitations: The small sample size of this study was identified as a limitation.
Ethics committee approval: Institutional ethics committee approval received.
Funding for this study: No funding was received for this study.
Author Disclosures:
Emanuele Messina: Nothing to disclose
Marco Bicchetti: Nothing to disclose
Valeria Panebianco: Nothing to disclose
Martina Pecoraro: Nothing to disclose
Martina Pisciotti: Nothing to disclose
Carlo Catalano: Nothing to disclose

OF 22Y-2
Cybersecurity in radiology artificial intelligence
B. S. Kelly, R. P. Killeen, P. Mathur, A. Lawlor; Dublin/IE

Purpose: Digital health includes integration with a myriad of medical devices, wireless technologies, data warehouses, sensors and wearables and even social networks all with an emphasis on real time connectivity.
Methods or Background: With these opportunities for patients however, comes risk to the healthcare provider in the form of challenges to personal data, privacy and security. These cybersecurity threats are not entirely new to healthcare but have certainly become more abundant with the digital health revolution and have indeed been named one of the major healthcare risks of 2021. Fortunately healthcare providers and devise manufacturers have the advantage of being able to take inspiration from other industries who are leading the way in the field.
Results or Findings: This exhibit seeks to give an introduction to cybersecurity as it pertains to medical imaging, a background to both general and healthcare specific cybersecurity challenges, general approaches to improving security through both detection and preventative techniques and ways that technology can increase security rather than causing risks.
Conclusion: Herein we propose to highlight how common cybersecurity issues need to be considered in development and implementation of AI and Big Data projects in radiology both for the benefit of patients, healthcare providers, institutions as well as industry partners.
Limitations: Educational Overview
Ethics committee approval: Not Required
Funding for this study: This work was performed within the Irish Clinical Academic Training (ICAT) Programme, supported by the Wellcome Trust and the Health Research Board (Grant Number 203930/B/16/Z), the Health Service Executive National Doctors Training and Planning and the Health and Social Care, Research and Development Division, Northern Ireland and the Faculty of Radiologists, Royal College of Surgeons in Ireland.
Author Disclosures:
Aonghus Lawlor: Nothing to disclose
Ronan P. Killeen: Nothing to disclose
Brendan S. Kelly: Nothing to disclose
Prateek Mathur: Nothing to disclose

08:00-09:00 **Room B**

Refresher Course: Genitourinary

RC 2207
Imaging of focal renal lesions

RC 2207-1
Chairperson's introduction
M. Bertolotto; Trieste/IT

RC 2207-2
What is the best imaging method to characterize solid renal lesions?
H. C. Thoeny; Fribourg/CH
(Harriet.thoeny@h-fr.ch)

Learning Objectives:
1. To identify the MRI sequences for characterising solid renal masses.
2. To describe the MRI features of the most common solid renal masses.
3. To distinguish solid renal masses using multiparametric MRI.
Author Disclosures:
Harriet C. Thoeny: Advisory Board: Guerbet SA; Speaker: Guerbet SA

RC 2207-3
Update on Bosniak classification to characterise cystic renal lesions
C. Nicolau; Barcelona/ES
(cnicolau@clinic.cat)

Learning Objectives:
1. To provide a short historical overview of the Bosniak classification.
2. To provide an overview of the Bosniak Classification version 2019.
3. To provide an overview of the EFSUMB 2020 proposal for a contrast-enhanced ultrasound-adapted Bosniak cyst categorisation.

RC 2207-4
What is the value of contrast-enhanced US in the assessment of renal masses
J.-M. Correas; Paris/FR
(jean-michel.correas@aphp.fr)

Learning Objectives:
1. To learn the technique and limitations of renal mass evaluation using contrast-enhanced US.
2. To understand the value of contrast-enhanced US to differentiate solid and cystic renal masses.
3. To learn about the potentials and limitations of contrast-enhanced US for the characterisation of solid renal masses (benign versus malignant lesions and subtypes of renal cell carcinoma).
Author Disclosures:
Jean-Michel Correas: Speaker: SuperSonic Imagine, Hologic, Canon, Siemens Healthinners, FujiFilm

Panel discussion: How to report pertinent findings in a structured way? CT vs MRI vs US?

08:00-09:00 **Room C**

Refresher Course: Neuro

RC 2211
Multiple sclerosis (MS) and other inflammatory diseases

RC 2211-1
Chairperson's introduction
A. Rovira-Cañellas; Barcelona/ES
Author Disclosures:
Alejandro Rovira-Cañellas: Advisory Board: Novartis, Sanofi-Genzyme, Biogen IDEC, OLEA Medical, Synthetic MR, Icometrix and Bayer; Speaker: Bayer, Sanofi-Genzyme, Bracco, Merck-Serono, Teva Pharmaceutical Industries Ltd, Novartis, Roche and Biogen Idec

RC 2211-2
MS: current criteria for diagnosis and follow-up
A. Rovira-Cañellas; Barcelona/ES

Learning Objectives:
1. To understand the timing and significance of MRI for the early diagnosis of MS.
2. To learn to apply the latest updates of the McDonald criteria for MS.
3. To appreciate the role of MRI in MS pharmacovigilance, including efficacy and safety.

RC 2211-3
Neuromyelitis optica spectrum disorder (NMOSD): aquaporin 4 and MOG disease
M. M. Thurnher; Vienna/AT
(majda.thurnher@meduniwien.ac.at)

Learning Objectives:
1. To understand the pathophysiology and immunology of NMOSD and myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD).
2. To learn about the imaging characteristics that help distinguish between different demyelinating disorders.
3. To introduce the "easy" diagnostic diagram to use during the daily routine.

RC 2211-4
Update on autoimmune diseases and encephalitis
T. A. Yousry; London/UK
(t.yousry@ucl.ac.uk)

Learning Objectives:
1. To understand the clinical presentation and diagnostic criteria.
2. To learn the typical imaging characteristics.
3. To learn about the role of imaging in the differential diagnosis.

Panel discussion: Benefits of a standardised MRI protocol for follow-up

08:00-09:00 **Room E2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 2221
Imaging of head and neck manifestations of systemic disease

E³ 2221-1
Autoimmune disorders: IgG, Sjogren's syndrome and others
M. Becker; Geneva/CH
(minerva.becker@hcuge.ch)

Learning Objectives:
1. To become familiar with the imaging characteristics of autoimmune disease manifestations in the head and neck.
2. To learn how to avoid interpretation pitfalls on CT, US and MRI.

E³ 2221-2
Lymphatic and haematopoietic neoplasms
F. A. Pameijer; Utrecht/NL
(f.a.pameijer@umcutrecht.nl)

Learning Objectives:
1. To become familiar with the imaging characteristics of lymphatic and haematopoietic neoplasms affecting the head and neck.
2. To learn how to avoid interpretation pitfalls on CT, US, and MRI.

08:00-09:00 **Room G**

Refresher Course: Physics in Medical Imaging

Jointly organised by the ESR and EFOMP

RC 2213

MRI scanning with cardiac devices: the new routine

RC 2213-1
Chairperson's introduction
O. Rampado; Turin/IT

RC 2213-2
The cardiologist's point of view
C. Allaart; Amsterdam/NL
(cp.allaart@amsterdamumc.nl)

Learning Objectives:
1. To understand the clinical need for improved provision of MRI to cardiovascular implantable electronic device (CIED) patients.
2. To describe the relative risks of MRI in patients with non-MR conditional CIEDs.
3. To describe the workflows for scanning MR conditional and non-MR conditional CIEDs.
Author Disclosures:
Cornelis Allaart: Author: Multiple papers on different aspects of Cardiac MRI related to CIED therapy; Board Member: Chairman of the Netherlands Heart Rhythm Association; Research Grant/Support: Institutional grant Biotronik; Speaker: Multiple talks on CIED related subjects

RC 2213-3
The radiologist's point of view
J. Habets; Nijmegen/NL

Learning Objectives:
1. To discuss challenges in cardiac MRI evaluation in patients with cardiac devices.
2. To reflect on the safety aspects of cardiac MRI imaging in patients with cardiac devices.
3. To identify available solutions to improve image quality in patients with cardiac devices.

RC 2213-4
The physicist's point of view
A. McCann; Belfast/IE

Learning Objectives:
1. To provide an overview of the physicist's role in MRI safety.
2. To provide an update on the current status of safety in different devices.
3. To discuss different devices in different MRI environments and safety solutions.

Panel discussion: What is the next development you most want to see?

08:00-09:00 **Room K**

Refresher Course: Chest

RC 2204

Pros and Cons: Low and ultra-low dose CT should be used for imaging thoracic disorders

RC 2204-1
Chairperson's introduction
M. Rémy-Jardin; Lille/FR

RC 2204-2
PRO
P. Ciet; Rotterdam/NL
(p.ciet@erasmusmc.nl)

Learning Objectives:
This house believes that low and ultra-low dose CT should be used for imaging thoracic disorders.
Author Disclosures:
Pierluigi Ciet: Grant recepient: NWO (Dutch Research Council) and Italian/American CF Foundation

RC 2204-3
CON
M. Prokop; Nijmegen/NL
(mathias.prokop@radboudumc.nl)

Learning Objectives:
This house believes that low and ultra-low dose CT should NOT be used for imaging thoracic disorders.
Author Disclosures:
Mathias Prokop: Research Grant/Support: Cann, Siemens; Speaker: Siemens, Canon, Bracco

Panel discussion: Radiation dose exposure can often be massively saved in chest imaging

08:00-09:00 **Room N**

E³ - Young ECR Programme: Basic Sessions

Organised by the EFRS

BS 22

Acknowledging and managing radiographer burnout

Moderator
L. A. Rainford; Dublin/IE

BS 22-2
The impact of burnout on student radiographers
L. A. Rainford; Dublin/IE
(louise.rainford@ucd.ie)

Learning Objectives:
1. To provide an overview of published research on this topic.
2. To understand the key factors impacting students' wellbeing.
3. To identify how students may be supported.

BS 22-3
Academic faculty insights
M. F. McEntee; Cork/IE
(mark.mcentee@ucc.ie)

Learning Objectives:
1. To understand factors causing academic burnout.
2. To provide an overview of recent research findings.
3. To discuss how to adapt going forwards.

BS 22-4
The clinical radiographer perspective
P. Cornacchione; Rome/IT
(patriziacornacchione@gmail.com)

Learning Objectives:
1. To define "burnout".
2. To gain an understanding of the current evidence base.
3. To provide a summary of recent radiography research.

BS 22-5
Compassionate leadership
A. Taylor; Exeter/UK
(A.Taylor11@exeter.ac.uk)

Learning Objectives:
1. To become familiar with compassionate leadership.
2. To discuss holistic approaches in focused times.
3. To outline tools and techniques for managing and preventing burnout.

Panel discussion: Lessons learnt from 2020 onwards and taking the positives forwards

08:00-09:00 **Room O**

Refresher Course: Abdominal Viscera

RC 2201
Liver ablations: treatment, evaluation, and follow-up

RC 2201-1
Chairperson's introduction
E. G. Klompenhouwer; Amsterdam/NL

RC 2201-2
Principles of liver ablations
C. J. Zech; Basle/CH
(christoph.zech@usb.ch)

Learning Objectives:
1. To appreciate the indications for liver ablations.
2. To learn about how to perform liver ablations.
3. To discuss the future prospects of liver ablations.

RC 2201-3
Treatment response evaluation
E. G. Klompenhouwer; Amsterdam/NL

Learning Objectives:
1. To learn which imaging protocol to use when evaluating the response after liver ablation.
2. To learn how to evaluate the response after liver ablation.
3. To become familiar with the pearls and pitfalls in evaluating treatment response of liver ablations.

RC 2201-4
Follow-up of liver ablations: the guidelines
M. Maas; Amsterdam/NL
(moniquemaas@live.nl)

Learning Objectives:
1. To learn how to follow-up patients after liver ablations.
2. To understand how to interpret imaging findings after liver ablations.
3. To become familiar with the pearls and pitfalls in the follow-up of liver ablations.

Panel discussion: Case-based

09:30-10:30 **Open Forum #1 (Radiographers)**

Open Forum Session

Organised by EuroSafe Imaging

OF 23R
Recommendations for setting alerts in patient dose values

Moderator
R. W. R. Loose; Nuremberg/DE

OF 23R-1
Introduction
R. W. R. Loose; Nuremberg/DE

OF 23R-2
Dose notifications and alerts: how to implement and use them
V. Tsapaki; Vienna/AT

Learning Objectives:
1. To learn the importance of notifications and alerts in the optimisation of imaging and interventions.
2. To describe the uses of these terms in international standards.
3. To identify the potential difficulties in their practical application.

OF 23R-3
Dose alerts in interventional radiology: how to monitor procedures and avoid skin injuries
E. Efstathopoulos; Alimos/GR
(stathise@med.uoa.gr)

Learning Objectives:
1. To learn the practical aspects for the use of alert levels.
2. To appreciate the benefits and problems in setting alert levels in interventional radiology.
3. To understand the advantages of alert levels to avoid skin radiation injuries.

OF 23R-4
The use of dose notifications and alerts to optimise procedures in CT
M. Lell; Nuremberg/DE
(michael.lell@klinikum-nuernberg.de)

Learning Objectives:
1. To learn the practical aspects using alerts in CT.
2. To appreciate the impact to the workload of radiographers and radiologists.
3. To understand the benefits derived from the use of alert values in CT.

Open forum discussion

09:30-10:30 **Open Forum #2 (Young ECR)**

Open Forum Session

OF 23Y
Women in radiology: does gender have an impact on career?

OF 23Y-1
Chairperson's introduction
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)

Learning Objectives:
Gender influences a wide range of career-related attitudes and behaviors, and outcomes. This includes career choice, career experiences, work attitudes, other people's perceptions, and career outcomes. This session aims to understand which influence gender has on career development.

OF 23Y-2
Advancing your career and finding fulfillment
H. Hricak; New York, NY/US
Author Disclosures:
Hedvig Hricak: Advisory Board: International Advisory Board, University of Vienna; External Advisory Board, CCC, John Hopkins; Scientific Advisory Board, Euro-Bioimaging, ERC; Board Member: Board of Directors, IBA; Board of Directors, Paige.AI; Board of Trustees, DKFZ; Other: Scientific Committee, DKFZ

OF 23Y-3
Gender disparity study in Spain
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)

OF 23Y-4
My personal experience as a female resident
S. Barter; Bedford/UK
I. Blazic; Belgrade/RS
(ivanablazic@yahoo.com)

Discussion

09:30-10:30 **Room C**

Refresher Course: Hybrid, Molecular and Translational Imaging

RC 2306

Pros and Cons: Functional, molecular and hybrid imaging will replace many morphological measures of response within RECIST

RC 2306-1
Chairpersons' introduction
G. Zamboni; Verona/IT
(gzamboni@hotmail.com)
F. A. Gallagher; Cambridge/UK
Author Disclosures:
Ferdia A. Gallagher: Grant recepient: GSK; Research Grant/Support: GE Healthcare

RC 2306-2
PRO
E. Lopci; Rozzano/IT
(egesta.lopci@gmail.com)

Learning Objectives:
This house believes that functional, molecular and hybrid imaging will replace many morphological measures of response within RECIST.
Author Disclosures:
Egesta Lopci: Author: Springer; Speaker: ESMIT, MI&T Congressi

RC 2306-3
CON
L. S. Fournier; Paris/FR
(laure.fournier@aphp.fr)

Learning Objectives:
This house believes that functional, molecular and hybrid imaging will NOT replace many morphological measures of response within RECIST.
Author Disclosures:
Laure S. Fournier: Grant recepient: Bristol-Myers-Squibb; Investigator: Philips, Evolucare, ArianaPharma; Speaker: Bayer, Novartis, Janssen, Sanofi, GE Healthcare; Other: Traveling support: Guerbet

Panel Discussion: What is the role for functional, molecular and hybrid imaging as companion biomarkers of drug response?

09:30-10:30 **Room F1**

Refresher Course: Neuro

RC 2311

Clinical spine neuroimaging

RC 2311-1
Chairperson's introduction
L. van den Hauwe; Antwerp/BE

RC 2311-2
Congenital spine lesions
A. Rossi; Genoa/IT
(andrearossi@gaslini.org)

Learning Objectives:
1. To review the basics of spine and spinal cord development.
2. To establish an imaging protocol for children with spinal malformations.
3. To learn more about the main congenital anomalies of the spine and spinal cord.

RC 2311-3
Imaging of back pain: upper and lower
T. Das; Cambridge/UK
(tilak.das@addenbrookes.nhs.uk)

Learning Objectives:
1. To summarise the clinical utility of three imaging modalities commonly used in the investigation of back pain.
2. To describe 'red flag' symptoms and signs that indicate urgent imaging.
3. To evaluate various international guidelines that direct the use of imaging in the management of back pain.

RC 2311-4
Minimally invasive treatment of back pain
L. Manfrè; Catania/IT
(lmanfre@me.com)

Learning Objectives:
1. To identify the potential of new imaging-assisted percutaneous surgery.
2. To list new devices and treatments for lower back pain resolution.
3. To describe the pros and cons of percutaneous versus conventional "open surgery" treatment.

Panel discussion

09:30-10:30 **Room K**

ESR meets Malaysia

Meets 23

Radiology skill set needed for Malaysia in facing battle with COVID-19

Presiding
A. G. Rockall; London/UK
N. Mohd Ramli; Kuala Lumpur/MY

Meets 23-1
Chairperson's introduction: Inter-society relationship and radiology in the post-COVID-19 era
N. Mohd Ramli; Kuala Lumpur/MY

Learning Objectives:
1. To address the changes in academic conferences and the education of specialists and residents in the COVID-19 era.
2. To address the changes occurring in the inter-society relationship and online platforms in the post-COVID-19 era.
3. To share our experience in the planning of international conferences.
4. To discuss if there is a role for virtual platforms in the future.

Meets 23-2
Radiology meeting the clinician's expectation in the battle with COVID-19
A. Abdul Aziz; Sungai Buloh, Selangor/MY

Learning Objectives:
1. To address the role of imaging in screening of COVID/PUI/PUS in the early pandemic era.
2. To outline the imaging findings to assist in the clinical management of severe COVID-19 patients in the intensive care setting.
3. To share our experience in planning and addressing COVID-19 patients' imaging follow up (long COVID/severe).

Meets 23-3
An alternate skill set in assisting the national vaccination programme
E. Chung; Kuala Lumpur/MY
(eric@um.edu.my)

Learning Objectives:
1. To describe the national vaccination plan and strategies over different timelines in Malaysia.
2. To demonstrate the role of radiologists outside the hospital setting during the pandemic.

Meets 23-4
Impact of the COVID-19 pandemic on breast cancer care and radiological perspectives
K. Rahmat; Kuala Lumpur/MY
(katt_xr2000@um.edu.my)

Learning Objectives:
1. To describe the impact of the COVID-19 pandemic on breast cancer care and imaging practices at the tertiary centre in Malaysia.
2. To demonstrate that delayed access to timely diagnosis and treatment as a result of movement restrictions and disrupted clinical workflows during the outbreaks are a major concern, which can lead to more intensive treatment and increased morbidity to the non-COVID-19 patient populations.
3. To summarise the efforts for recovery and options to mitigate the adverse effects on diagnostic imaging, clinical workflow, research, and education.
Author Disclosures:
Kartini Rahmat: Grant recepient: GE Healthcare; Research Grant/Support: Hologic

Panel discussion

09:30-10:30 **Room N**

Refresher Course: Head and Neck

RC 2308
Acute head and neck imaging

RC 2308-1
Chairperson's introduction
J. W. Casselman; Bruges/BE
(jan.casselman@azsintjan.be)
Author Disclosures:
Jan Walther Casselman: Speaker: Giving lectures for Philips Healthcare and Cefla S.A.; Other: Customers visits (to see equipment) for Philips Healthcare.

RC 2308-2
Facial and skull base trauma imaging
J. W. Casselman; Bruges/BE

Learning Objectives:
1. To demonstrate which imaging technique should be used to visualise different traumatic facial and skull base lesions.
2. To detail how different traumatic facial and skull base lesions should be described and named.
3. To analyse which traumatic facial and skull base lesions have the most important clinical impact.
Author Disclosures:
Jan Walther Casselman: Speaker: For Philips Healthcare and Cefla S.A.; Other: Receive visitors to see equipment from Philips Healthcare

RC 2308-3
Imaging infections of the head and neck
S. Colley; Birmingham/UK
(Steve.Colley@uhb.nhs.uk)

Learning Objectives:
1. To describe the most common sites of origin and aetiology of deep neck space infection in adults.
2. To become familiar with the anatomical routes of spread from the site of infection.
3. To understand the potential complications of infections in the head and neck, which should be considered in the acute setting.

Panel discussion: Is there a role for radiography, ultrasound, or MRI in acute head and neck imaging: the panel's experience

09:30-11:00 **Room A**

E^3 - Advanced Courses: Cancer Imaging

E^3 2318
Paediatric brain tumours: a multidisciplinary approach

E^3 2318-1
Chairperson's introduction
B. Ertl-Wagner; Toronto, ON/CA
(BirgitBetina.Ertl-Wagner@sickkids.ca)

Learning Objectives:
1. To highlight the importance of a multidisciplinary management of paediatric brain tumours.
2. To review the most recent developments in imaging of paediatric brain tumours.
3. To discuss challenging aspects in assessing response to treatment.
Author Disclosures:
Birgit Ertl-Wagner: Other: Husband employee of Siemens Healthineers

E^3 2318-2
Neurooncology and neuroradiology: why we need each other – the oncologist's perspective
U. Tabori; Toronto, ON/CA

E^3 2318-3
Paediatric brain tumours in the molecular age
B. Ertl-Wagner; Toronto, ON/CA
(BirgitBetina.Ertl-Wagner@sickkids.ca)
Author Disclosures:
Birgit Ertl-Wagner: Other: Husband employee of Siemens Healthineers

E^3 2318-4
Challenges with response assessment
Z. Patay; Memphis, TN/US

E^3 2318-5
Multidisciplinary tumour board: case-based panel discussion
B. Ertl-Wagner; Toronto, ON/CA
(BirgitBetina.Ertl-Wagner@sickkids.ca)
Author Disclosures:
Birgit Ertl-Wagner: Other: Husband employee of Siemens Healthineers

09:30-11:00 **Room B**

E³ - Advanced Courses: Gynaecology/Genitourinary Imaging

E³ 2332

Renal masses

E³ 2332-1
Chairperson's introduction
M.-F. Bellin; Le Kremlin-Bicêtre/FR

Learning Objectives:
1. To review the treatment options for solid renal masses in frail patients.
2. To understand the role of imaging in the treatment selection and planning of small renal masses.
3. To discuss the role of focal treatment of solid renal masses.
4. To provide practical steps on how to stage renal cell carcinoma using multimodality imaging.

E³ 2332-2
Management options of renal masses in the frail patient
G. Stewart; Cambridge/UK

Learning Objectives:
1. To be able to best determine which patients with which tumours should be considered for treatment.
2. To understand the current and near-future treatment options for frail patients with a renal mass.
3. To recognise the evidence gaps.
Author Disclosures:
Grant Stewart: Advisory Board: Pfizer, Merck, Cambridge Medical Robotics, EUSA Pharma; Grant recepient: Pfizer, AstraZeneca, Intuitive Surgical; Speaker: Pfizer, Merck

E³ 2332-3
Focal treatment of solid renal masses
B. Gebauer; Berlin/DE
(bernhard.gebauer@charite.de)

Learning Objectives:
1. To review the indications of focal treatment in solid renal masses and follow-up after focal treatment.
2. To understand the techniques of focal treatment.
3. To provide practical tips, to demonstrate how I do focal treatment, and to review focal treatment complications.
Author Disclosures:
Bernhard Gebauer: Advisory Board: INARI, TERUMO, BAYER, MSD, ROCHE

E³ 2332-4
Multimodality staging of renal cell carcinoma: pearls and pitfalls
I. Caglic; Cambridge/UK
(iztokcaglic@gmail.com)

Learning Objectives:
1. To review the TNM staging and most common metastatic sites of RCC.
2. To provide practical steps on how to stage RCC using multimodality imaging.
3. To discuss pearls and pitfalls in RCC staging.

E³ 2332-5
Multidisciplinary tumour board: case-based panel discussion
M.-F. Bellin; Le Kremlin-Bicêtre/FR

09:30-11:00 **Room D**

E³ - Young ECR Programme: Basic Sessions

Organised by the EFRS

BS 23b

The importance of professional engagement

Moderator
G. Paulo; Coimbra/PT

BS 23b-2
Engaging with professional societies
C. Beardmore; London/UK
(CharlotteB@sor.org)

Learning Objectives:
1. To learn about the roles of professional societies.
2. To understand the benefits of professional engagement.
3. To provide advice on how to get engaged.

BS 23b-3
Active continuing professional development (CPD) opportunities
A. England; Cork/IE
(aengland@ucc.ie)

Learning Objectives:
1. To gain an understanding of the importance of CPD and its culture.
2. To outline current international CPD opportunities.
3. To provide tips on staying CPD active.
Author Disclosures:
Andrew England: Board Member: EFRS

BS 23b-4
Engaging with research
J. Santos; Coimbra/PT
(joanasantos@estescoimbra.pt)

Learning Objectives:
1. To understand what is meant by "being research active".
2. To outline the importance of radiography research.
3. To suggest stepping stones for research success.

BS 23b-5
The importance of a multidisciplinary outlook
B. R. Mussmann; Odense/DK
(bo.mussmann@rsyd.dk)

Learning Objectives:
1. To understand the benefits of a multidisciplinary approach.
2. To outline examples of multidisciplinary activity.
3. To discuss the importance of innovative team dynamics to improve care.

Panel discussion: What are the barriers and solutions to professional engagement?

09:30-11:00 **Room E2**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 2321a

Breast lesions of uncertain malignant potential (B3 lesions): the management conundrum

E³ 2321a-1
Imaging appearance of B3 lesions
P. A. T. Baltzer; Vienna/AT

Learning Objectives:
1. To understand the entire spectrum of lesions with uncertain malignant potential (B3).
2. To learn how B3 lesions appear on mammography, tomosynthesis, contrast-enhanced mammography, ultrasound, and non-contrast and contrast-enhanced MRI.
3. To discuss their different biological behaviour in relation to contrast-enhanced imaging modalities.
Author Disclosures:
Pascal A.T. Baltzer: Board Member: EUSOBI, DRG, OERG; Founder: www.radiologie-weiterbildung.de; Research Grant/Support: institutional support by Bracco; Speaker: Bayer

E³ 2321a-2
The clinical management of B3 lesions
S. Schiaffino; San Donato Milanese/IT
(schiaffino.simone@gmail.com)

Learning Objectives:
1. To distinguish between low- and high-risk B3 lesions.
2. To learn about the impact of needle size and imaging guidance on the exclusion of associated malignancy.
3. To learn how to discuss the clinical management of B3 lesions in the multidisciplinary setting.

09:30-11:00 **Room G**

E³ - Advanced Courses: Interactive Teaching Sessions for Young (and not so Young) Radiologists

E³ 2321b

Imaging biomarkers of diffuse liver disease

E³ 2321b-1
Multiparametric MRI
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)

Learning Objectives:
1. To become familiar with the US imaging methods for the evaluation of liver fibrosis.
2. To learn how to evaluate patients with liver fibrosis at multiparametric US.

E³ 2321b-2
Multiparametric US
V. Cantisani; Rome/IT
(vito.cantisani@uniroma1.it)

Learning Objectives:
1. To become familiar with the new US imaging methods for the evaluation of steatosis.
2. To learn how to manage patients with liver steatosis at multiparametric US.
Author Disclosures:
Vito Cantisani: Speaker: Samsung Mindray Bracco Canon

09:30-11:00 **Room O**

E³ - European Diploma Prep Sessions

E³ 2323

Gynaecology and obstetrics

E³ 2323-1
Chairperson's introduction
V. Bura; Cambridge/UK

Learning Objectives:
To understand the imaging presentation of the most common benign and malignant disorders of the uterus. To become familiar with inflammatory and neoplastic disorders of the adnexa. To understand the imaging features of acute gynaecological disorders and of acute diseases in pregnancy.

E³ 2323-2
Imaging of the uterus
R. Woitek; Cambridge/UK

Learning Objectives:
1. To comprehend the imaging anatomy of the uterus and its changes throughout life and during pregnancy.
2. To understand the typical imaging features and local imaging-based staging of cervical and endometrial cancer.
3. To become familiar with the typical imaging features of benign disorders of the uterus, especially uterine leiomyomas, adenomyosis, and endometriosis.
Author Disclosures:
Ramona Woitek: Speaker: GE Healthcare

E³ 2323-3
Disorders of the adnexa
R. Forstner; Salzburg/AT
(r.forstner@salk.at)

Learning Objectives:
1. To describe the imaging features of benign tumours of the ovaries.
2. To understand the diagnostic evaluation and imaging features of malignant tumours of the ovaries.
3. To identify the imaging features in regard to the stage and extent of adnexal tumours.
4. To become familiar with the imaging features useful for differentiating adnexal masses.

E³ 2323-4
Acute gynaecological and obstetric disorders
L. Manganaro; Rome/IT
(lucia.manganaro@uniroma1.it)

Learning Objectives:
1. To become familiar with the typical and atypical imaging features of acute disorders of the uterus and the ovaries.
2. To understand the common emergencies associated with acute gynaecological disorders, including ectopic pregnancy, placenta previa, and emergencies related to abortion.

09:30-11:00 **Room X**

E³ - Young ECR Programme: Basic Sessions

Organised by the ESR

BS 23a

Thorax: high-resolution computed tomography (HRCT) of lung disease

Moderator
M.-P. Revel; Paris/FR

BS 23a-2
HRCT findings: parenchimal opacification
M.-P. Revel; Paris/FR
(marie-pierre.revel@aphp.fr)

Learning Objectives:
1. To become familiar with the most common aetiologies.
2. To demonstrate the most important imaging findings.
Author Disclosures:
Marie-Pierre Revel: Speaker: GE Healthcare, Bracco, Chiesi, Boeringher-Ingelheim; Other: Expert annotation for GE Healthcare and Gleamer

BS 23a-3
HRCT findings: air-filled lung cysts
N. Sverzellati; Parma/IT

Learning Objectives:
1. To become familiar with the most common aetiologies.
2. To demonstrate the most important imaging findings.
Author Disclosures:
Nicola Sverzellati: Advisory Board: Boehringer Ingelheim, Chiesi; Research Grant/Support: Chiesi; Speaker: Boehringer Ingelheim, Chiesi, Menarini, Janssen

BS 23a-4
HRCT findings: mosaic attenuation pattern/decreased attenuation
C. M. Schaefer-Prokop; Amersfoort/NL
(cornelia.schaeferprokop@gmail.com)

Learning Objectives:
1. To become familiar with the most common aetiologies.
2. To demonstrate the most important imaging findings.

11:30-12:30 **Open Forum #2 (Young ECR)**

Open Forum Session

Organised by the ESR Quality, Safety and Standards Committee

OF 24Y

Undergraduate radiology education: a paradigm shift

OF 24Y-1
Chairperson's introduction: A paradigm shift in teaching radiation protection
F. Kainberger; Vienna/AT

Learning Objectives:
With a view on recent developments in both medical education and clinical imaging, the radiology training of students should be redesigned by merging advances in both fields. The modern interdisciplinary approach taught in many undergraduate curricula fits neatly with the way radiologists practise clinically. In addition, general topics such as professionalism, decision making, teamwork, and other clinical skills frame the curriculum. Regarding radiation protection, the training of using appropriateness criteria for imaging is becoming the most relevant goal toward which all other subjects such as imaging anatomy and medical physics are directed. These include the techniques for generating a clinical hypothesis, considering aspects of patient safety, health management, communication, and digital health. The newer concepts embedded in this holistic approach are cumulative effective dose, risk competency and risk communication, and artificial intelligence.

OF 24Y-2
Clinical and diagnostic reasoning: a new mantra in radiology education
L. Oleaga Zufiría; Barcelona/ES
(lauraoleaga@gmail.com)

OF 24Y-3
Teaching and learning: lessons learned from the EU Basic Safety Standards Directive
R. W. R. Loose; Nuremberg/DE

OF 24Y-4
ESR iGuide as an educational tool
T. Diekhoff; Berlin/DE

Discussion

11:30-12:30 **Room A**

Round Table Session

RT 24

Building bridges: working from home in radiology, a blessing, or a curse?

RT 24-1
Chairperson's introduction
E. Kotter; Freiburg/DE

Learning Objectives:
1. To know the results of the ESR survey on insourcing teleradiology services among partners of the same organisation.
2. To learn about the pros and cons of working from home in radiology.
3. To understand whether and how teleworking will impact the visibility of radiology.
4. To know whether and how the rapid development of telecommunication tools will influence the evolution of teleradiology.
Author Disclosures:
Elmar Kotter: Advisory Board: Contextflow; Share Holder: Contextflow; Speaker: Siemens Healthineers, AbbVie

RT 24-2
The pros and cons of telework in radiology
R. Gunderman; Indianapolis, IN/US

RT 24-3
ESR survey results on insourcing teleradiology services among partners of the same organisation
O. Ratib; Geneva/CH
(osman.Ratib@unige.ch)
Author Disclosures:
Osman Ratib: CEO: Agora Care - Switzerland; Founder: Agora Care - Switzerland

RT 24-4
Discussion
R. Gunderman; Indianapolis, IN/US
O. Ratib; Geneva/CH
(osman.Ratib@unige.ch)
D. Akata; Ankara/TR
E. Neri; Pisa/IT
(emanuele.neri@med.unipi.it)
E. Kotter; Freiburg/DE
D. Labajo; Madrid/ES
Author Disclosures:
Osman Ratib: CEO: Agora Care - Switzerland; Founder: Agora Care - Switzerland
Emanuele Neri: Speaker: GE /Healthcare - ESAOTE-Ebit - Bayer
Elmar Kotter: Advisory Board: Contextflow; Share Holder: Contextflow; Speaker: Siemens Healthineers, AbbVie

11:30-12:30 **Room B**

Refresher Course: Musculoskeletal

RC 2410

MSK impingement

RC 2410-1
Chairperson's introduction
C. Schaeffeler; Chur/CH

RC 2410-2
Shoulder impingement syndromes
C. Schaeffeler; Chur/CH

Learning Objectives:
1. To discuss the pathogenesis of shoulder impingement.
2. To discuss the imaging findings.
3. To discuss the potential role of imaging-guided intervention.

RC 2410-3
Hip impingement syndromes
E. Vassalou; Iraklion/GR
(vassalou.e@hotmail.com)

Learning Objectives:
1. To discuss the pathogenesis of hip impingement.
2. To discuss the imaging findings.
3. To discuss the potential role of imaging-guided intervention.

RC 2410-4
Impingement syndromes of other joints
P. D. Afonso; Lisbon/PT
(p.diana.a@gmail.com)

Learning Objectives:
1. To discuss the pathogenesis of impingement of joints other than the shoulder and hip.
2. To discuss the imaging findings.
3. To discuss the potential role of imaging-guided intervention.

Panel discussion: Basic vs advanced imaging protocols: reference values of femoral and acetabular parameters in femoroacetabular impingement and how to use them

11:30-12:30 **Room N**

Refresher Course: Radiographers

RC 2414
Developments in magnetic resonance imaging

RC 2414-1
Chairpersons' introduction
F. Zarb; Msida/MT
(francis.zarb@um.edu.mt)
M. Rupreht; Maribor/SI

RC 2414-2
Low-field imaging: where it fits in a modern MRI service
J. C. Vilanova; Girona/ES
(kvilanova@comg.cat)

Learning Objectives:
1. To describe the current applications of low-field MRI.
2. To analyse the cost-effectiveness of low-field MRI in a clinical setting.
3. To discuss the diagnostic quality of low-field MRI examinations.

RC 2414-3
Zero TE imaging: applications and considerations
T. Wood; London/UK
(tobias.wood@kcl.ac.uk)

Learning Objectives:
1. To discuss current approaches to ultrashort echo time (UTE) and zero echo time (TE) techniques.
2. To describe the advantages and limitations of UTE and zero TE imaging.
3. To identify specific clinical applications for UTE and zero TE MR.

RC 2414-4
Remote scanning: the MRI: radiographers' friend or foe?
D. Hudson; Exeter/UK
(darren.hudson@inhealthgroup.com)

Learning Objectives:
1. To discuss the drivers behind remote scanning solutions in MRI.
2. To describe how remote scanning support in MRI can be utilised in practice.
3. To examine the considerations for implementation in practice.

Panel discussion: Now more than ever, there is a need for dedicated undergraduate and postgraduate MRI programmes

13:00-14:00 **Room C**

Refresher Course: Breast

RC 2502
Breast tomosynthesis

RC 2502-1
Chairperson's introduction
S. Perez Rodrigo; Madrid/ES

RC 2502-2
Update of tomosynthesis in the screening setting
A. Tagliafico; Genoa/IT

Learning Objectives:
1. To acknowledge the current scientific evidence for the use of digital breast tomosynthesis in screening.
2. To consider how to overcome potential obstacles in the screening workflow with digital breast tomosynthesis.

RC 2502-3
Tomosynthesis vs contrast-enhanced MRI
C. K. Kuhl; Aachen/DE
(ckuhl@ukaachen.de)

Learning Objectives:
1. To describe the diagnostic accuracy of contrast-enhanced spectral mammography and contrast-enhanced breast MRI.
2. To list the advantages and disadvantages of both imaging methods.
3. To describe the appropriate image acquisition strategies for both methods.
Author Disclosures:
Christiane K. Kuhl: Advisory Board: Bayer, Guerbet

RC 2502-4
Update on tomo-guided interventions (a must in every radiology department?)
S. Perez Rodrigo; Madrid/ES
(drasilviap@gmail.com)

Learning Objectives:
1. To describe the technique and differences with the conventional technique.
2. To describe the advantages and disadvantages.
3. To discuss the real need of this system in a radiology department.
Author Disclosures:
Silvia Perez Rodrigo: Advisory Board: BD, GE, Motiva

Panel discussion: What is tomosynthesis, beyond a better mammography?

13:00-14:00 **Room G**

Refresher Course: Oncologic Imaging

RC 2516
Imaging of immunotherapy

RC 2516-1
Chairperson's introduction
G. Zamboni; Verona/IT
(gzamboni@hotmail.com)

RC 2516-2
Classic pearls and pitfalls in immunotherapy imaging
C. Dromain; Lausanne/CH
(Clarisse.Dromain@chuv.ch)

Learning Objectives:
1. To describe the characteristics of response to immunotherapy.
2. To understand pseudoprogression and how to differentiate a pseudoprogression from a true progression.
3. To describe the major immune-related adverse events and their potential misinterpretation as new lesions.

RC 2516-3
The bright side: response evaluation in immunotherapy
C. C. Cyran; Munich/DE

Learning Objectives:
1. To learn about morphological criteria-based response assessment in immunotherapy (iRECIST and friends).
2. To appreciate the added value of metabolic and hybrid response assessment criteria (PERCIST, EORTC, and PERCRIT).
3. To become acquainted with novel molecular imaging techniques for monitoring the response to immunotherapy.
Author Disclosures:
Clemens C. Cyran: Speaker: AAA, Brainlab, Mint Medical

RC 2516-4
The dark side: recognising adverse effects
M. Nishino; Boston, MA/US

Learning Objectives:
1. To recognise the spectrum of imaging findings of immune-related adverse events (irAEs) in major organs.
2. To understand the role of imaging in detection, diagnosis, and monitoring of irAEs.
3. To understand the importance of the multidisciplinary approach to irAEs.
Author Disclosures:
Mizuki Nishino: Research Grant/Support: Research grant to the institution from AstraZeneca, Daiichi-Sankyo, Canon Medical Systems, and NIH

Panel discussion: Not good enough? Limits of morphological imaging in immunotherapy

13:00-15:30 **Room E2**

E³ - Young ECR programme: Case-Based Diagnosis Training

CB

Case-Based Diagnosis Training

CB-1
Chairpersons' introduction
S. Robinson; Vienna/AT
K. M. Friedrich; Vienna/AT

CB-2
Liver
L. Martí-Bonmatí; Valencia/ES
(marti_lui@gva.es)

CB-3
Neuro
D. Prayer; Vienna/AT

CB-4
Paediatrics
S. C. Shelmerdine; London/UK
(susie_c_s@yahoo.co.uk)

CB-5
Maxillofacial
S. Robinson; Vienna/AT
(s.robinson@dzu.at)

CB-6
Genitourinary
M. Toepker; Vienna/AT
(mt@dz10.at)

CB-7
Interlude: Food-related imaging signs
B. Ozgen Mocan; Chicago, IL/US
(burcem@gmail.com)

CB-8
Head and neck
U. Schwarz-Nemec, C. Czerny; Vienna/AT

CB-9
Chest
H. Prosch; Vienna/AT

CB-10
Spine
K. M. Friedrich; Vienna/AT

CB-11
Gastrointestinal
W. Schima; Vienna/AT
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CB-12
Breast
P. Clauser; Vienna/AT
(clauser.p@hotmail.it)
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Paola Clauser: Speaker: Siemens Healthineers