**Background:**
There is strong evidence to suggest that diagnostic accuracy in radiological reporting improves when the clinical information provided is detailed. This has importance for optimising patient care, especially in trauma where time can be critical. Understandably, if a radiologist can appreciate the most likely injuries associated with certain mechanisms of trauma then diagnostic yield in trauma reporting improves.

This presentation draws on trauma imaging of the chest, abdomen and pelvis undertaken at a level 1 trauma centre in Greater London. We illustrate the traumatic injuries associated with differing mechanisms of blunt injury and discuss the factors to consider when evaluating them.

**Learning objectives:**
Understand how certain “packages” of bodily injury are commonly seen with different mechanisms of trauma. Aid identification of abnormalities on cross-sectional imaging seen in association with these mechanisms. Deliver a template for logical assessment of polytrauma imaging.

**Midline / Seatbelt injury:**
The images below demonstrate a patient with a midline injury sustained from a vehicle’s seatbelt after a RTA:
- • Well demarcated soft tissue injuries, consistent with the passenger belt
- • Inflammatory stranding, free fluid at the mesenteric root and peripneumoperitoneum, consistent with multi-site traumatic small bowel injury and rupture.
- • Subcutaneous emphysema tracks along the left abdominal and anterior abdominal walls.

**Midline Shearing Injury:**
Flexible and mobile structures are vulnerable to shearing injuries. Below is a case of aortic injury, a dissection flap is clear and corresponds to the superior attachment of the ligamentum arteriosum.
After completing biphasic imaging the radiologist must evaluate the following:
- • Establish the level of aortic injury: aortic root, arch or below?
- • Identify complications, e.g. haemorrhage (and/or active bleeding)
- • Check for perfusion anomalies compromising the visceral bearing branches.

**Left sided trauma:**
The next case demonstrates traumatic left sided injuries in the context of a road traffic accident.
It clearly shows a left-sided diaphragmatic rupture, which is an injury often overlooked. Note, it is more common in blunt trauma.
The left diaphragmatic rupture is shown clearly on the coronal views:
- • There is herniation of the gastric fundus & body into the thorax.
- • A clear demonstration of the “collar-sign”. Be careful, on axial views this injury can be overlooked, look out for dependant viscera lying against the posterior thoracic wall. Be sure to check both diaphragms – the injury is bilateral in 5% of cases.

**Right sided Trauma:**
The case below demonstrates a major right sided trauma.
Note solid organ injury, intrabdominal and intrathoracic injuries with a right sided distribution in body:
- • Sub-capsular low attenuation extending through the right lobe of the liver, consistent with Grade IV liver laceration.
- • Linear region of non-enhancement in the right kidney, indicative of right renal injury.
- • Retro-peritoneal and intra-abdominal haematoma in the right abdomen.
- • Pulmonary contusions are present in the right lung.
- • The anterior abdominal wall shows a defect extending through the soft tissue layers with associated emphysema.

**Fall from height:**
The patient who falls from a height is at risk of multiple injuries that may span all “packets” depending on the site and side of impact.
These may include:
- Thoracic (e.g. flail chest)
- Spinal (e.g. burst fractures)
- Abdominal and abdominal visceral (e.g. lacerations and shearing injuries)
- Pelvic and pelvic ring (bladder injury, pelvic fractures and bony disruption).
A scanogram can yield a lot of information relating to any skeletal injuries. The radiologist should always review this as part of the trauma assessment.

Multiple fractures of the axial and appendicular skeleton are demonstrated by the case below, a fall from height with impact via the lower limbs and feet, resulting in:
- Comminuted right calcaneal fracture.
- Complex sacral fracture and L2 vertebral body fracture.
Another case (also shown below) highlights a vertical shearing disruption to the pelvic ring, also following a fall from height onto the lower limbs. Delayed phase imaging should be performed in this case to evaluate for bladder injury, including intra or extra-peritoneal rupture.

**Vector of force – trauma “package”**

<table>
<thead>
<tr>
<th>Left- sided</th>
<th>Midline</th>
<th>Right sided</th>
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<tbody>
<tr>
<td>Spleen</td>
<td>Left hepatic lobe</td>
<td>Right hepatic lobe</td>
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<tr>
<td>Left Kidney</td>
<td>Aorta</td>
<td>Right kidney</td>
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<tr>
<td>Diaphragm</td>
<td>Pancreatic body</td>
<td>Diaphragm</td>
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<td>Pancreatic tail</td>
<td>Transverse colon</td>
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<tr>
<td></td>
<td>Duodenum &amp; small bowel</td>
<td>IVC</td>
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