

# Specific considerations

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**Spleen** There is a risk of splenic pseudoaneurysm after splenic trauma, which is unrelated to the severity of the injury ( Table 19.1 Therefore, a follow-up ultrasound is recommended. Claude Couinaud , 1922–2008, French surgeon and anatomist, described the segmental anatomy of the liver. - - , - - Liver The grades of liver trauma are given in Table 19.2 . Bile leaks ). are rare and often resolve after drainage rather than repair but should be discussed with a paediatric liver surgeon.

Grade	Injury type	Description of injury
I	Haematoma	Subcapsular, <10% surface area
II	Laceration	Capsular tear, <1 /uni00A0 cm parenchymal depth
III	Haematoma	Subcapsular, 10–50% surface area, intraparenchymal, <5 /uni00A0 cm in diameter
IV	Laceration	Capsular tear, 1–3 /uni00A0 cm parenchymal depth not involving a trabecular vessel
V	Haematoma	Subcapsular, >50% surface area or expanding; ruptured subcapsular or parenchymal haematoma, intraparenchymal haematoma ≥ 5 /uni00A0 cm or expanding
VI	Laceration	>3 /uni00A0 cm parenchymal depth or involving a trabecular vessel
VII	Laceration	Involving segmental or hilar vessels producing major devascularisation (>25%)
VIII	Laceration	Completely shattered spleen
IX	Vascular	Devascularised by a hilar injury

TABLE 19.2 Liver injury scale. Grade Injury type Description of injury I Haematoma Subcapsular, <10% surface area Laceration Capsular tear, <1 /uni00A0 cm parenchymal depth II Haematoma Subcapsular, 10–50% surface area, intraparenchymal, <10 /uni00A0 cm in diameter III Haematoma Subcapsular, >50% surface area or expanding; ruptured subcapsular or parenchymal haematoma; intraparenchymal haematoma ≥ 10 /uni00A0 cm or expanding Laceration >3 /uni00A0 cm parenchymal depth or involving a trabecular vessel IV Laceration Parenchymal disruption involving 25–75% of hepatic lobe or 1–3 Couinaud segments in a single lobe V Laceration Parenchymal disruption involving >75% of hepatic lobe or >3 Couinaud segments within a single lobe Vascular Juxtahepatic venous injuries VI Vascular Hepatic avulsion

**Pancreatic trauma** may lead to a pancreatic pseudocyst, which requires endoscopic drainage into the stomach. For distal lacerations in the pancreatic tail, some surgeons prefer an early distal pancreatectomy rather than non-operative management. Proximal pancreatic duct injuries in older children can be stented. **Renal** After severe renal injuries, hypertension can develop, which may need treatment. A dimercaptosuccinic acid (DMSA) scan is used to assess function in those with hypertension or following grade IV or V injuries ( Table 19.3 ). **Duodenum** A duodenal haematoma has a risk of late perforation, which may be retroperitoneal. Therefore, a second abdominal CT scan or a contrast study should be considered if there is dete rioration or recovery is particularly slow . **Bowel** There are three mechanisms: the bowel wall may fail instantly if pressure rises rapidly in a trapped loop, it may fail up to 72 /uni00A0 hours after a direct crush injury or it may become ischaemic following a mesenteric injury damaging its blood supply . In straddle injuries and pelvic fractures there may be blood at the urethral meatus. Urethral catheterisation can aggravate a urethral injury , and so a suprapubic catheter should be placed.

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