

[HOSPITAL / HEALTH AUTHORITY NAME]

THORACIC, ABDOMINAL, AND PELVIC TRAUMA PATHWAY

Protocol 33: Rapid Recognition, Life-Saving Intervention, Haemorrhage Control, Imaging, Source Control, Transfer, and Safe Disposition

DRAFT FOR EMERGENCY MEDICINE, TRAUMA / SURGERY, ANAESTHESIA, CRITICAL CARE, RADIOLOGY, ORTHOPAEDICS, UROLOGY, OBSTETRICS, PAEDIATRICS, NURSING, EMS, BLOOD BANK, PHARMACY, OPERATING THEATRE, INTERVENTIONAL RADIOLOGY, AND TRANSFER SERVICES

STATUS: This is a draft clinical-governance document. It must be adapted to local staffing, imaging, blood-bank, surgery, anaesthesia, chest-drain, interventional-radiology, critical-care, paediatric, obstetric, and transfer capabilities. Drug doses, device choices, procedural scope, massive-haemorrhage packs, antibiotic regimens, and referral routes require local approval before implementation.

IMMEDIATE SAFETY RULE: In suspected thoracic, abdominal, or pelvic trauma, treat catastrophic external haemorrhage, airway compromise, tension pneumothorax, open pneumothorax, massive haemothorax, shock, and impending arrest immediately. Do not delay life-saving intervention for imaging, laboratory results, transfer paperwork, or a complete secondary survey.

Document control	Details
Document owner	Emergency Department / Medical Services Directorate / Nursing Services / Clinical Governance
Clinical leads	Emergency Medicine; Trauma / General Surgery; Anaesthesia / Critical Care; Radiology; Orthopaedics; Urology; Obstetrics; Paediatrics
Applies to	Adults, children, pregnant patients, older adults, and vulnerable patients with blunt or penetrating injury involving the chest, abdomen, pelvis, flank, perineum, or thoracoabdominal junction
Interfaces	Protocol 31 Major Trauma; Protocol 32 Head and Spinal Injury; Protocol 49 Major Haemorrhage; Protocol 50 Procedural Sedation; local operating-theatre, blood-bank, interventional-radiology, transfer, safeguarding, and antimicrobial policies
Version / status	Draft 1.0 for local multidisciplinary validation
Review cycle	After any serious incident, major guideline change, service change, or at least every 2 years
Required approval	Emergency Department; Surgery / Trauma; Anaesthesia / Critical Care; Radiology; Nursing; Pharmacy; Blood Bank; Clinical Governance

1. Purpose

To provide a standardized emergency-department pathway for rapid recognition, stabilization, investigation, definitive treatment, transfer, observation, and disposition of thoracic, abdominal, and pelvic trauma while preventing avoidable death from obstructive shock, occult haemorrhage, delayed hollow-viscus injury, respiratory failure, and missed associated injury.

2. Scope

This protocol applies from pre-alert or first contact until discharge, observation, admission, operative or interventional treatment, critical-care transfer, specialist transfer, rehabilitation referral, or death. It complements the general major-trauma pathway and focuses on injuries of the chest wall, pleura, lungs, mediastinum, diaphragm, abdominal wall and viscera, retroperitoneum, pelvis, genitourinary tract, and perineum.

3. Core policy statements

- Use a parallel <C>ABCDE approach. Catastrophic haemorrhage and immediately reversible breathing threats are treated before definitive diagnosis.
- An unstable patient with a suspected thoracic, abdominal, or pelvic source requires simultaneous resuscitation and source-control planning. Repeated crystalloid boluses without haemorrhage control are unsafe.
- Tension pneumothorax is a clinical diagnosis in the unstable patient. Decompress immediately using the approved trained-clinician technique, then place definitive pleural drainage.
- Do not repeatedly “spring” or compress the pelvis. Apply a pelvic binder at the greater trochanters when pelvic-ring injury with bleeding is suspected, unless contraindicated by anatomy or local specialist direction.

- FAST / eFAST supports rapid decisions but cannot exclude retroperitoneal, hollow-viscus, diaphragmatic, pancreatic, mesenteric, or early solid-organ injury. A negative scan does not override physiology or serial examination.
- In haemodynamically stable or stabilized patients, contrast-enhanced CT is the principal test for significant thoracoabdominal and pelvic injury. Imaging must not delay operative, interventional, or transfer decisions in an unstable patient.
- Non-operative management of solid-organ injury is permitted only where serial examination, haemoglobin monitoring, rapid access to blood, surgery, critical care, repeat imaging, and rescue intervention are reliably available.
- Penetrating trauma requires wound mapping, trajectory awareness, tetanus review, early surgical discussion, and antibiotics according to the approved local antimicrobial pathway. Do not probe wounds or remove impaled objects in the ED.
- Analgesia, respiratory support, warming, calcium, haemostatic resuscitation, and prevention of hypoxaemia and hypotension are active components of haemorrhage control and organ protection.
- Begin referral and transfer as soon as a need for higher-level surgery, interventional radiology, cardiothoracic care, paediatric trauma, obstetric trauma, or critical care is suspected. Stabilize only what is necessary for safe transport; do not create avoidable delay.
- Every delayed chest decompression, missed hollow-viscus injury, delayed pelvic binder, transfer failure, retained haemothorax, unplanned return, unexpected deterioration, or death is reviewed through clinical governance.

4. Definitions and severity framework

Term	Operational definition
Thoracic trauma	Blunt or penetrating injury involving chest wall, pleura, lungs, mediastinum, heart, great vessels, diaphragm, or thoracic oesophagus.
Abdominal trauma	Blunt or penetrating injury involving abdominal wall, intraperitoneal or retroperitoneal organs, bowel, mesentery, pancreas, or major vessels.
Pelvic trauma	Injury involving the pelvic ring, acetabulum, pelvic viscera, perineum, major vessels, or lumbosacral plexus.
Haemodynamic instability	Shock or threatened shock attributable to trauma, including hypotension, narrow pulse pressure, altered mentation, weak pulses, cool skin, rising lactate / base deficit, oliguria, or ongoing transfusion requirement.
Transient responder	Initial physiological improvement with resuscitation followed by recurrent shock, suggesting ongoing haemorrhage.
Peritonitis	Involuntary guarding, rigidity, rebound or clinically convincing diffuse peritoneal irritation; may be absent early, in older adults, children, pregnancy, intoxication, or impaired consciousness.
Damage-control strategy	Abbreviated resuscitation and source control prioritized over definitive reconstruction in physiologically exhausted patients.
Definitive capability	The combination of trained staff, operating theatre / IR, blood products, imaging, anaesthesia, critical care, and postoperative support required to safely manage the injury.

Physiological category	Typical findings	Minimum response
Unstable / non-responder	Persistent shock, peri-arrest, severe respiratory compromise, ongoing transfusion need, worsening lactate or mentation	Immediate senior trauma and anaesthesia response; MHP; bedside eFAST / CXR only if it changes action; urgent source control or transfer without delay.
Transient responder	Temporary improvement followed by recurrent hypotension / tachycardia or renewed transfusion need	Assume ongoing bleeding; maintain MHP readiness; urgent CT only if it can be completed safely and changes immediate source-control route.
Stable / responder	Sustained perfusion after limited resuscitation, reliable examination, no escalating support	Contrast CT / targeted imaging, serial examination, analgesia, specialist plan, and monitored disposition.
Initially well but high risk	Dangerous mechanism, anticoagulation, frailty, distracting injury, seatbelt sign, penetrating trajectory, lower-rib injury, pelvic pain, or unreliable examination	Low threshold for imaging, prolonged observation, repeated examination, and senior review despite normal initial vital signs.

5. Roles and accountability

Role	Minimum responsibility
Senior ED / trauma clinician	Lead <C>ABCDE; assign likely source; authorize immediate decompression / MHP / binder / imaging; coordinate surgery, anaesthesia, IR, and transfer.
Airway / anaesthesia clinician	Provide oxygenation, ventilation, analgesia / sedation, RSI, haemodynamic support, chest-procedure support, and transport readiness.
Trauma / general surgeon	Determine operative versus non-operative strategy; lead abdominal source control; coordinate cardiothoracic, vascular, urology, orthopaedic, or obstetric input.
Primary nurse	Monitoring, vascular access, blood sampling, medication and blood administration, warming, urine output, drain observation, serial documentation, and checklist completion.
Procedure clinician	Perform pleural decompression / thoracostomy or other emergency procedure within scope; document indication, site, technique, complications, and post-procedure confirmation.
Radiology / sonography	Prioritize trauma imaging, provide immediate critical-result communication, and support repeat / interventional imaging.
Blood bank / laboratory	Activate MHP; issue blood products; provide urgent haemoglobin, coagulation, fibrinogen, calcium, blood gas, and group / crossmatch support.
Transfer coordinator / receiving clinician	Accept early referral, agree destination and transport requirements, preserve time-critical care, and provide closed-loop handover.
All staff	Escalate deterioration, protect dignity and forensic evidence, identify safeguarding concerns, and report delays or near misses.

6. Pre-alert, preparation, and triage

- Receive ATMIST / MIST: age, mechanism, time, suspected trajectory, trapped / crush time, physiology and trend, GCS, interventions, response, anticoagulants, pregnancy, and estimated arrival.
- Activate trauma, surgery, anaesthesia, radiology, blood bank, operating theatre, orthopaedics, urology, obstetrics, paediatrics, critical care, and transfer services according to physiology and mechanism; do not wait for CT confirmation.
- Prepare oxygen, suction, difficult-airway equipment, thoracic decompression and chest-drain equipment, pelvic binder, haemorrhage-control supplies, rapid infuser / warmer, blood products, ultrasound, warming devices, and transport ventilator.
- Triage as immediate / highest acuity for respiratory distress after trauma, unilateral absent breath sounds with shock, penetrating torso trauma, evisceration, impalement, peritonitis, unstable pelvis, haematuria with shock, abdominal distension with shock, or any transient responder.
- Use a protected trauma bay with radiation, sharps, forensic, and staff-safety precautions. For contaminated wounds or violence-related injury, follow exposure and security procedures.

7. First 10 minutes: parallel action

1. Receive structured handover while controlling catastrophic external bleeding and maintaining airway / spinal precautions as indicated.
2. Complete <C>ABCDE. Treat tension pneumothorax, open pneumothorax, major haemothorax, severe airway compromise, and external haemorrhage immediately.
3. Attach ECG, pulse oximetry, frequent non-invasive blood pressure, respiratory rate and temperature monitoring; use waveform capnography for ventilated or deeply sedated patients.
4. Obtain two large-bore IV lines or IO access. Send FBC, group and crossmatch, coagulation / fibrinogen, electrolytes, renal and liver profile, glucose, blood gas / lactate, ionized calcium, pregnancy test when relevant, and targeted tests.
5. Activate the massive-haemorrhage protocol for shock with suspected bleeding or escalating blood requirement. Warm patient, fluids and blood; minimize unnecessary crystalloid.
6. Apply a pelvic binder over the greater trochanters when unstable pelvic-ring injury is suspected; document time and skin checks. Do not repeatedly manipulate the pelvis.
7. Perform eFAST and portable chest / pelvic imaging only when it will change immediate management. A negative eFAST does not exclude serious injury.
8. Call surgery and anaesthesia early. Decide: immediate procedure / theatre, urgent CT, interventional radiology, observation, or transfer.

9. Give titrated analgesia, antiemetic, tetanus prophylaxis and antibiotics when indicated; preserve impaled objects and forensic evidence.
10. Reassess after every intervention, movement, blood-product cycle, imaging event, drain insertion, and physiological change; document response and unresolved threats.

8. Primary assessment and immediate treatment

8.1 Catastrophic haemorrhage and circulation

- Control external bleeding with direct pressure, packing, haemostatic dressing, tourniquet where appropriate, and rapid exposure of hidden junctional / perineal wounds.
- Assume internal haemorrhage when shock follows torso or pelvic trauma. Search chest, abdomen, pelvis, retroperitoneum, long bones, and external sites in parallel.
- Use balanced blood-component or approved whole-blood resuscitation according to Protocol 49. Give tranexamic acid as early as possible and within 3 hours when significant traumatic bleeding is present or strongly suspected, unless contraindicated by local policy.
- Monitor ionized calcium and replace according to the massive-haemorrhage pathway. Prevent hypothermia and worsening acidosis. Use viscoelastic testing where available without delaying treatment.
- Permissive lower blood-pressure targets may be used in selected bleeding adults before haemostasis, but not when traumatic brain injury, spinal cord perfusion concern, pregnancy-related uteroplacental compromise, or other contraindication requires higher pressure. Individualize with senior trauma / anaesthesia input.
- Persistent or recurrent shock despite initial resuscitation requires immediate source-control escalation, not repeated diagnostic delay.

8.2 Airway and breathing

- Assess airway, voice, neck / facial injury, subcutaneous emphysema, tracheal position, chest movement, respiratory effort, breath sounds, percussion, oxygen saturation, and ventilation.
- Treat tension pneumothorax clinically in the unstable patient. Perform immediate decompression using the locally approved finger or needle technique by a trained clinician, followed by definitive pleural drainage.
- For open pneumothorax, apply a vented occlusive dressing or equivalent. If a non-vented dressing is used, monitor continuously for tension and release immediately if deterioration occurs. Insert a chest drain remote from the wound.
- For massive haemothorax or haemopneumothorax causing compromise, insert an appropriately sized chest drain, continue haemostatic resuscitation, measure output, and obtain immediate surgical / cardiothoracic advice.
- Use lung-protective ventilation, adequate analgesia, and early critical-care support for pulmonary contusion, flail chest, fatigue, severe hypoxaemia, or progressive hypercapnia. Avoid excessive crystalloid.
- In traumatic arrest or peri-arrest, follow the approved traumatic-cardiac-arrest algorithm, including immediate correction of hypoxia, bilateral tension pneumothorax, tamponade and haemorrhage by trained teams.

8.3 Disability, exposure, and adjuncts

- Record GCS components, pupils, limb movement, glucose, temperature, and analgesia before sedatives / paralysis when possible. Head or spinal injury may alter abdominal examination and blood-pressure targets.
- Fully expose chest, back, flanks, abdomen, groins, perineum and buttocks using coordinated log-roll only when safe. Prevent hypothermia and protect dignity.
- Inspect for seatbelt sign, lower-rib fractures, abdominal wall bruising, penetrating wounds, evisceration, pelvic deformity, blood at urethral meatus, scrotal / labial bruising, vaginal / rectal bleeding, and open pelvic injury.
- Do not probe wounds, clamp blindly, remove impaled objects, replace eviscerated bowel, or perform repeated pelvic compression. Cover eviscerated tissue with sterile warm saline-moistened non-adherent dressings.
- Insert urinary catheter only after assessing urethral-injury risk. Do not perform blind urethral catheterization when blood at meatus, high-riding / non-palpable prostate, perineal bruising, pelvic fracture with voiding difficulty, or other strong suspicion exists; seek urology and consider retrograde urethrography / suprapubic drainage.

9. Focused history and examination

Domain	Key questions / findings
Mechanism	Blunt versus penetrating; impact direction / speed; crush; fall height; ejection; pedestrian / cyclist; blast; stab / firearm; possible trajectory; seatbelt / airbag; handlebar injury; timing.
Symptoms	Dyspnoea, pleuritic pain, chest pressure, abdominal / flank / shoulder-tip pain, vomiting, haematemesis, haematuria, inability to void, pelvic / perineal pain, weakness, dizziness, syncope.
Physiology and trend	Prehospital and current BP, pulse, RR, SpO ₂ , GCS, temperature, lactate / base deficit, fluid and blood received, response and recurrent deterioration.

Domain	Key questions / findings
Risk modifiers	Anticoagulant / antiplatelet, bleeding disorder, pregnancy, age, frailty, chronic lung / heart / renal disease, prior thoracic / abdominal surgery, organ transplant, obesity, intoxication.
Chest examination	Air entry, symmetry, wounds, crepitus, rib / sternal tenderness, flail segment, subcutaneous emphysema, heart sounds, neck veins, pulse deficit, tracheal deviation.
Abdominal examination	Distension, bruising, tenderness, guarding, rigidity, bowel sounds, wounds, evisceration, flank / back tenderness, serial change.
Pelvic / GU examination	Binder position, pelvic pain / deformity, leg-length or rotational change, groin / perineal wounds, meatal blood, scrotal / labial swelling, vaginal / rectal bleeding only when specifically indicated.
Associated injury	Head, spine, limbs, vascular, burns, pregnancy, safeguarding and violence-related injury; identify distracting injury and unreliable examination.

10. Bedside tests, laboratory studies, and imaging

IMAGING RULE: Unstable patients go to the intervention that controls the most likely immediately lethal source. Stable or stabilized patients with significant torso trauma generally require contrast-enhanced CT. FAST, plain radiographs, and normal initial haemoglobin do not exclude serious injury.

Test / modality	Use and limitations
eFAST	Rapid detection of pleural air / fluid, pericardial fluid, and intraperitoneal free fluid. Repeat when physiology changes. Negative results do not exclude retroperitoneal, bowel, mesenteric, pancreatic, diaphragmatic, early solid-organ, or contained vascular injury.
Portable chest radiograph	Tube / line position, large pneumothorax / haemothorax, mediastinal or diaphragmatic clues. It must not delay decompression and may miss important injury.
Pelvic radiograph	Useful in unstable patients when it changes binder / source-control planning. Usually unnecessary when immediate CT is being performed and does not delay care.
CT chest / abdomen / pelvis with IV contrast	Primary comprehensive imaging for stable or stabilized significant torso trauma. Use arterial / delayed phases when vascular or urinary injury is suspected according to radiology protocol.
CT angiography	Suspected blunt aortic / great-vessel injury, active arterial bleeding, vascular injury, selected penetrating trajectories, or unexplained shock.
Laboratory trend	Haemoglobin may initially be normal. Trend blood gas / lactate, base deficit, calcium, fibrinogen, coagulation, renal function, platelets and urine output alongside clinical response.
Diagnostic peritoneal aspiration / lavage	Reserved for selected unstable patients when FAST is unavailable / equivocal and the result will immediately determine laparotomy, according to local surgical expertise.
Endoscopy / bronchoscopy / cystography / urethrography	Specialist-directed tests for suspected aerodigestive or genitourinary injury; do not delay stabilization or transfer.

11. Thoracic trauma pathways

Injury / syndrome	Recognition and immediate management
Tension pneumothorax	Shock or peri-arrest with severe respiratory compromise, unilateral reduced air entry, distended chest / subcutaneous emphysema or high airway pressure. Decompress immediately; do not await imaging. Follow with chest drain and reassessment.

Injury / syndrome	Recognition and immediate management
Open pneumothorax	Sucking chest wound / visible pleural communication. Vented occlusive dressing, oxygen, analgesia, chest drain away from wound, antibiotics / tetanus per policy, surgery.
Massive haemothorax	Shock, reduced air entry / dullness, pleural fluid. Chest drain plus MHP, warming, calcium, and urgent surgery / cardiothoracic discussion. Large immediate output, persistent high output, ongoing shock, or transfusion dependence requires operative evaluation; physiology overrides any numeric threshold.
Cardiac tamponade	Penetrating or blunt mechanism with shock, narrow pulse pressure, raised JVP or pericardial fluid. Immediate senior trauma / surgical action. Pericardiocentesis is a bridge when definitive surgical decompression is not immediately available; clotted haemopericardium may not drain.
Flail chest / pulmonary contusion	Pain, paradoxical movement, hypoxaemia or increasing work of breathing. Multimodal / regional analgesia, pulmonary hygiene, oxygen, cautious fluids, NIV or intubation when needed, and early fixation discussion for selected patients.
Blunt aortic injury	High-energy deceleration, mediastinal clues, pulse / BP differential, unexplained shock. CTA when stable; minimize shear stress with specialist-directed heart-rate / BP control if not contraindicated; urgent vascular / cardiothoracic transfer.
Tracheobronchial injury	Persistent large air leak, failure of lung re-expansion, severe subcutaneous emphysema, haemoptysis. Secure airway with expert help, avoid repeated traumatic attempts, bronchoscopy / surgery, transfer.
Diaphragmatic rupture	Thoracoabdominal mechanism, bowel sounds in chest, abnormal diaphragm / herniated viscera, unexplained respiratory or abdominal symptoms. Avoid blind NG placement if uncertain; CT and urgent surgery.
Oesophageal injury	Penetrating trajectory, severe chest pain, mediastinal air / fluid, dysphagia, sepsis. NPO, broad-spectrum antibiotics, urgent surgery / thoracic consultation and specialist imaging.
Rib / sternal injury	Assess respiratory reserve, age, fracture burden, anticoagulation and comorbidity. Analgesia, incentive breathing / physiotherapy, ECG / troponin when blunt cardiac injury suspected, and admission for high-risk features.

12. Chest-drain and pleural-procedure safety

- Use the approved local technique, equipment and insertion site; ultrasound may support site selection but must not delay emergency decompression. Confirm side and indication verbally before incision whenever circumstances permit.
- Provide asepsis, adequate analgesia / sedation, monitoring, and resuscitation readiness. In an unstable patient, life-saving drainage takes precedence over ideal procedural conditions.
- Connect to the approved underwater-seal / drainage system, secure all connections, document depth and output, and obtain imaging when clinically appropriate without delaying surgery or transfer.
- Reassess breath sounds, chest movement, oxygenation, ventilation, haemodynamics, drain swing / bubbling, subcutaneous emphysema and pain. Sudden deterioration requires immediate review for blocked, dislodged, clamped, malpositioned or tensioning drain.
- Do not routinely clamp a chest drain in a patient with ongoing air leak, positive-pressure ventilation, or unresolved pneumothorax unless specifically directed by an experienced clinician for a defined purpose.
- Retained haemothorax, persistent air leak, non-expanding lung, recurrent pneumothorax, empyema, diaphragmatic concern, or significant drain output requires early surgical / thoracic review.

13. Abdominal and retroperitoneal trauma

- Immediate laparotomy / operative source-control discussion is required for unstable patients with a convincing abdominal source, peritonitis, evisceration with instability, uncontrolled penetrating injury, or deterioration that cannot safely await CT.
- In stable or stabilized patients, use IV-contrast CT to define solid-organ, bowel, mesenteric, retroperitoneal, vascular, pancreatic and urinary injury. Oral contrast is not routinely required in initial trauma CT.
- Solid-organ injury may be managed non-operatively only with sustained haemodynamic stability, no peritonitis or other operative indication, reliable serial examination, monitoring, rapid access to blood / theatre / IR, and an explicit rescue plan.
- Active arterial contrast extravasation, pseudoaneurysm, ongoing transfusion need, or delayed bleeding may require angioembolization or surgery depending on physiology and local capability.
- Suspect bowel / mesenteric injury with seatbelt sign, free fluid without solid-organ injury, bowel-wall thickening, mesenteric stranding / haematoma, pneumoperitoneum, worsening tenderness, fever, ileus, acidosis, or unexplained deterioration. Early findings may be subtle; use serial senior examination and repeat CT when indicated.
- Pancreatic, duodenal and diaphragmatic injuries are commonly delayed or missed. Maintain suspicion with epigastric blow, handlebar injury, Chance fracture, retroperitoneal air / fluid, unexplained enzymes, or persistent pain.
- For penetrating wounds, map every wound, consider trajectory across chest / abdomen / pelvis, preserve evidence, cover evisceration, give tetanus and approved antibiotics, and obtain immediate surgical input. Selective non-operative care requires expert systems and reliable observation.
- Do not discharge a patient with persistent or worsening pain, guarding, vomiting, unexplained tachycardia, rising lactate, falling haemoglobin, inability to mobilize / tolerate oral intake, or unreliable follow-up.

14. Pelvic, perineal, and genitourinary trauma

Issue	Required action
Suspected unstable pelvic ring	Apply binder over greater trochanters, keep legs aligned where safe, avoid repeated manipulation, activate MHP and orthopaedic / trauma / IR pathway.
Pelvic haemorrhage with instability	Exclude thoracic and abdominal sources in parallel. Proceed rapidly to the locally available source-control route: preperitoneal packing, external fixation / C-clamp, angioembolization, operative control, or selected REBOA by credentialed teams. Do not delay definitive control while debating sequence.
Open pelvic fracture	Immediate trauma, orthopaedic, colorectal / urology / gynaecology input; haemorrhage control, broad-spectrum antibiotics, tetanus, sterile dressing, contamination assessment and urgent debridement / diversion planning.
Suspected urethral injury	Do not blindly catheterize. Obtain urology advice and retrograde urethrography where available; use suprapubic drainage when indicated and within capability.
Bladder injury	Suspect with gross haematuria, pelvic fracture, low urine output, suprapubic pain or free pelvic fluid. CT cystography / specialist-directed imaging; intraperitoneal rupture usually requires surgery.
Renal injury	Gross haematuria, flank trauma / mass, shock, rib or spine injury. Contrast CT with delayed phase when stable. Persistent bleeding, vascular injury, solitary kidney or urinary extravasation requires urology / IR / surgery plan.
Perineal / rectal / vaginal injury	Inspect gently when indicated; avoid repeated digital examination. Give antibiotics and obtain urgent colorectal, urology, gynaecology and safeguarding / forensic input.
Binder care	Record indication and time, reassess placement after transfers, inspect skin, and remove / replace only under an approved definitive plan. A binder does not replace haemorrhage control or orthopaedic stabilization.

15. Analgesia, respiratory support, and supportive care

- Provide early multimodal analgesia. Use small titrated IV opioid doses, paracetamol, regional blocks, ketamine, or other approved options according to physiology and expertise. Avoid undertreatment that impairs ventilation and assessment.
- For rib fractures or chest wall injury, use upright positioning when safe, coached deep breathing, coughing, secretion clearance, incentive spirometry where used, and early physiotherapy. Escalate if oxygen requirement, work of breathing or CO₂ rises.
- Use antiemetics, warming, pressure-area care, glucose correction, and careful fluid balance. Keep NPO when operative injury remains possible, while preventing avoidable dehydration.

- Give tetanus prophylaxis according to wound history. Use antibiotics for penetrating thoracoabdominal injury, open fractures, hollow-viscus contamination, open pelvic injury, or other defined indications according to the local antimicrobial policy; do not give routine antibiotics for uncomplicated blunt trauma.
- Begin VTE-risk assessment once bleeding is controlled; mechanical and pharmacological prophylaxis timing is determined by the responsible trauma / surgical service.

16. Special populations and presentations

Population / situation	Additional requirements
Pregnancy	Maternal resuscitation first; left uterine displacement when uterus is large enough to compress vena cava; early obstetric input; fetal assessment after maternal stabilization; Rh status / anti-D according to policy; do not withhold necessary CT.
Children	Age-adjusted physiology and equipment; early paediatric / surgical consultation; minimize radiation but do not under-image high-risk injury; non-operative solid-organ care requires paediatric capability; consider non-accidental injury.
Older adult / frailty	Minor mechanisms may cause major injury; lower threshold for CT / admission; reverse anticoagulation promptly when bleeding; assess baseline function, cognition, goals of care and medication burden.
Anticoagulated / bleeding disorder	Identify agent, dose and last use; send relevant tests without delaying treatment; activate approved reversal pathway when significant bleeding is present or urgent surgery is required.
Obesity	Examination and FAST may be less reliable; binder / equipment sizing and airway / transport risks require early planning; use CT when stable.
Intoxication / altered consciousness	Do not attribute pain, hypotension or reduced responsiveness to substances until major injury is excluded. Use imaging and observation when examination is unreliable.
Blast / crush	Expect combined lung, bowel, vascular, rhabdomyolysis, compartment and contamination injury; monitor potassium, renal function, temperature and delayed deterioration.
Penetrating violence / safeguarding	Preserve clothing and projectiles, document wounds objectively, maintain chain of custody, provide privacy, screen for domestic / community violence, and involve safeguarding / police only according to law and consent obligations.
Resource-limited setting	Prioritize clinical diagnosis, life-saving procedures, haemostatic resuscitation, early surgical decision and transfer. Do not keep an unstable patient for unavailable CT / IR / specialist care.

17. Reassessment and detection of deterioration

Reassessment element	Minimum standard / trigger
Frequency	Continuous monitoring in unstable patients; documented <C>ABCDE after each intervention and at least every 15-30 minutes until stable, then according to acuity and local observation policy.
Respiratory	New hypoxaemia, increased work, unilateral reduced air entry, rising airway pressure, subcutaneous emphysema, worsening pain or hypercapnia -> immediate chest and drain reassessment.
Circulatory	Any recurrent hypotension, rising pulse, narrowing pulse pressure, cool skin, altered mentation, oliguria, rising lactate / base deficit, falling fibrinogen / calcium, or increasing transfusion -> assume ongoing bleeding until proved otherwise.
Abdominal	Increasing tenderness, guarding, distension, vomiting, ileus, fever, unexplained acidosis or new free fluid -> urgent senior surgical review and repeat imaging / operation as indicated.
Pelvic / GU	Binder displacement, increasing pain / swelling, gross haematuria, anuria, perineal bleeding, limb ischaemia, neurological deficit or skin injury -> immediate specialist review.

Reassessment element	Minimum standard / trigger
Drain	Output volume and character, air leak, patency, swing, insertion site, securement and pain. Sudden cessation with deterioration or rapid blood loss is an emergency.
Documentation	Record times of activation, procedures, blood products, TXA, imaging, critical results, consultations, source-control decision, transfer acceptance, and responsible clinician.

18. Disposition, transfer, and discharge

Destination	Minimum criteria
Immediate theatre / intervention	Ongoing instability with identified / strongly suspected source, peritonitis, uncontrolled thoracic bleeding, tamponade, major vascular injury, open pelvic injury, or other time-critical operative indication.
Critical care / high dependency	Ventilation or significant respiratory support, vasoactive support, ongoing transfusion, severe chest injury, high-grade solid-organ injury, complex pelvic trauma, major comorbidity, or need for intensive serial assessment.
Specialist transfer	Required cardiothoracic, vascular, IR, urology, orthopaedic, paediatric, obstetric, or trauma-centre capability unavailable locally. Referral starts early; send imaging and laboratory data without delaying departure.
Ward / observation	Stable physiology, defined injury and responsible service, completed imaging / plan, serial-examination capability, analgesia and rescue pathway, and no unresolved time-critical concern.
ED discharge	Only for minor injury after senior assessment: stable vital signs, adequate pain control and ventilation, no significant imaging / laboratory concern, mobilizing and tolerating intake, reliable supervision / follow-up, and written red flags.
No discharge	Persistent tachycardia, hypotension, hypoxaemia, significant anaemia, rising lactate, worsening pain, guarding, repeated vomiting, inability to mobilize / breathe deeply, unreliable examination, suspected occult injury, or unsafe social circumstances.

- Use a structured transfer handover including mechanism, injury map, physiology and trend, airway / ventilation, drains and output, binder, blood products, TXA, calcium, drugs, imaging, suspected injuries, unresolved threats, and agreed destination.
- Ensure escort competence, oxygen / blood / medications, monitor, ventilator, suction, warming, chest-drain system, procedure kit, and contingency plan match the patient's risk.
- Discharge advice must include return immediately for breathlessness, fainting, worsening chest / abdominal / pelvic pain, repeated vomiting, haematemesis, blood in stool or urine, inability to void, fever, increasing swelling, weakness, or new confusion.

19. Documentation, governance, and audit

Indicator	Suggested measure
Recognition	Time from arrival to trauma activation, first senior review, eFAST, pelvic binder, MHP activation, and surgical consultation.
Life-saving intervention	Time to decompression for clinically suspected tension pneumothorax; time to chest drain / source control; response documented.
Haemorrhage care	TXA within 3 hours when indicated; blood-product ratios / whole-blood use per policy; calcium, temperature, fibrinogen and lactate monitoring.
Imaging	Time to CT in stable / stabilized patients; critical-result communication; proportion of unstable patients delayed in CT.
Pelvic care	Binder indication, correct position, application time, skin checks, and time to definitive haemorrhage control.
Drain care	Procedure documentation, complications, output charting, retained haemothorax / repeat intervention rate.
Missed injury	Unplanned return, delayed hollow-viscus / diaphragmatic / vascular / GU diagnosis, unexpected operation, ICU transfer or death.

Indicator	Suggested measure
Transfer	Referral time, acceptance time, departure time, completeness of handover, transfer-related deterioration.
Experience and equity	Pain relief, communication, privacy, safeguarding, access to definitive care, and disparities by age, sex, disability, geography or socioeconomic status.
Learning	Completion of case review, simulation, equipment checks, corrective action and re-audit after serious incidents.

20. Minimum equipment and readiness

- Thoracic decompression and chest-drain kits in adult and paediatric sizes; vented chest seals; underwater-seal drainage; securement and dressing supplies.
- Pelvic binders in appropriate sizes; haemostatic dressings, tourniquets and packing; ultrasound; portable monitoring and capnography.
- Massive-haemorrhage packs / whole blood according to policy, rapid infuser, blood warmer, calcium, TXA, point-of-care blood gas / lactate and coagulation support.
- Difficult-airway and transport-ventilation equipment; suction; warming devices; procedure sedation / analgesia medicines; reversal agents.
- 24-hour referral contacts for surgery, anaesthesia, orthopaedics, urology, obstetrics, paediatrics, radiology / IR, cardiothoracic / vascular surgery, critical care, blood bank and transport.
- Monthly checks and simulation for tension pneumothorax, traumatic arrest, massive haemorrhage, pelvic bleeding, drain failure, and interfacility transfer.

21. References and evidence base

1. National Institute for Health and Care Excellence. Major trauma: assessment and initial management (NG39). 2016; current online version.
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8. Eastern Association for the Surgery of Trauma. Practice Management Guidelines: thoracic, abdominal, pelvic, renal, rib-fracture, whole-blood, TXA, and trauma-in-pregnancy topics; current online collection.
9. American College of Surgeons Committee on Trauma. Best Practices Guidelines and trauma quality resources; current versions.
10. Local approved policies: Major Trauma; Massive Haemorrhage; Anticoagulant Reversal; Procedural Sedation; Antimicrobial Prophylaxis; Chest Drain; Transfer; Safeguarding; Pregnancy Trauma.

Annex 1. One-page ED workflow

Step	Action
PRE-ALERT	ATMIST / MIST; activate trauma, surgery, anaesthesia, blood bank, CT / theatre / IR and transfer as required; prepare decompression, drain and binder equipment.
<C>	Control external haemorrhage; expose hidden junctional / perineal wounds; activate MHP for shock with suspected bleeding.
A	Open / secure airway with spinal precautions as indicated; use expert RSI and capnography when required.
B	Oxygen, inspect / palpate / auscultate. Tension -> immediate decompression then drain. Open wound -> vented seal and drain. Massive haemothorax -> drain + blood + surgery.
C	Two IV / IO, bloods, blood products, TXA if indicated, calcium / warming, eFAST, pelvic binder over greater trochanters, early source-control decision.
D / E	GCS / pupils / glucose; expose chest, abdomen, back, flanks, pelvis and perineum; prevent hypothermia; preserve wounds / evidence.
DECIDE	Unstable -> immediate intervention / theatre / IR / transfer. Stable / stabilized -> contrast CT and serial examination.
REASSESS	Repeat <C>ABCDE after every intervention / movement / blood cycle. Trend lactate, base deficit, calcium, fibrinogen, urine and drain output.
DISPOSITION	Named responsible service, rescue plan, monitoring level, transfer readiness, and written discharge instructions only for genuinely minor injury.

Annex 2. Immediate thoracic emergency card

Finding	Do now	Do not
Suspected tension pneumothorax	Immediate decompression by trained clinician; then chest drain; reassess physiology and tube position.	Do not wait for CXR, ultrasound or CT in an unstable patient.
Open pneumothorax	Vented occlusive dressing, oxygen, analgesia, chest drain away from wound, surgery.	Do not seal non-vented without continuous monitoring for tension.
Massive haemothorax	Chest drain, MHP, warming / calcium, urgent surgery / cardiothoracic advice.	Do not rely on drain volume alone; persistent shock is decisive.
Tamponade	Immediate trauma / surgical activation; definitive decompression. Pericardiocentesis only as bridge when appropriate.	Do not be reassured by absent classic signs.
Traumatic arrest	Approved traumatic-arrest algorithm; correct hypoxia, bilateral tension, tamponade and haemorrhage immediately.	Do not apply a medical-arrest sequence without addressing trauma causes.

Annex 3. Abdominal and pelvic decision card

Clinical state	Abdominal action	Pelvic action
Unstable / non-responder	eFAST if immediately available; peritonitis / positive FAST / convincing source -> theatre / damage control. Negative FAST does not exclude bleeding.	Binder at greater trochanters; MHP; exclude chest / abdomen; proceed to packing / fixation / angio / operative route per local capability.
Transient responder	Urgent source-control planning. CT only if safe, immediately available and changes the intervention route.	Maintain binder; activate orthopaedics / surgery / IR; do not delay definitive haemorrhage control.
Stable / sustained responder	Contrast CT, serial examination, surgical review and explicit NOM rescue criteria.	CT with appropriate phases, orthopaedic / urology plan, skin and neurovascular checks.

Clinical state	Abdominal action	Pelvic action
Penetrating / evisceration	Cover evisceration, do not probe / remove object, antibiotics / tetanus, urgent surgery.	Inspect perineum, preserve evidence, assess rectal / vaginal / GU injury only when indicated, urgent multidisciplinary care.

Annex 4. Pelvic-haemorrhage checklist

Check	Record
Binder	Indication: ____ Applied at greater trochanters: Y / N Time: ____ Skin checked: ____
Physiology	Lowest BP: ____ Lactate / base deficit: ____ Response: non-responder / transient / responder
MHP	Activated: ____ RBC / plasma / platelets / whole blood: ____ TXA: ____ Calcium: ____ Temperature: ____
Other sources	Chest assessed / treated: ____ Abdomen / eFAST: ____ External / long-bone bleeding: ____
Source-control plan	Packing / external fixation / angioembolization / operation / REBOA / transfer: ____
GU / open injury	Meatal blood / haematuria / perineal wound / vaginal or rectal injury: ____ Catheter plan: ____
Times	Trauma call: ____ Surgery: ____ CT: ____ Theatre / IR: ____ Referral: ____ Departure: ____

Annex 5. Chest-drain observation record

Time	SpO2 / RR / BP	Drain output total / interval	Air leak / swing	Site / securement	Pain / action
____	____	____	____	____	____
____	____	____	____	____	____
____	____	____	____	____	____
____	____	____	____	____	____
____	____	____	____	____	____
____	____	____	____	____	____

CHEST-DRAIN ESCALATION: Sudden deterioration, rapid blood loss, new or increasing air leak, absent swing with respiratory compromise, drain dislodgement, blockage, worsening subcutaneous emphysema, or failure of lung re-expansion requires immediate senior review.

Annex 6. Transfer and handover checklist

Domain	Minimum handover
Identity / mechanism	Patient identifiers; injury time; blunt / penetrating mechanism; wound map / trajectory; pregnancy / safeguarding.
Physiology	Current and worst BP, pulse, RR, SpO2, GCS, temperature, lactate / base deficit; responder category.
Airway / breathing	Airway device, ventilation, chest findings, decompression, drain side / size / output / air leak, oxygen requirement.
Circulation	Access, MHP, blood products, TXA, calcium, vasopressors, binder, urine output, anticoagulant / reversal.

Domain	Minimum handover
Imaging / diagnoses	eFAST, CXR, CT, critical results, suspected missed injuries, imaging shared with receiver.
Procedures / drugs	Analgesia / sedation, antibiotics, tetanus, procedures and complications.
Unresolved threats	Likely bleeding source, deterioration triggers, pending tests, source-control plan, accepted destination and responsible clinician.
Transport	Escort, monitor, ventilator, oxygen, suction, blood / drugs, warmer, chest-drain system, procedure / arrest contingency.

Annex 7. Audit tool

Audit field	Record
Arrival and activation	Arrival: ____ Trauma activation: ____ Senior review: ____ Surgery: ____ Anaesthesia: ____
Life-saving actions	Decompression: ____ Chest drain: ____ Binder: ____ MHP: ____ TXA: ____
Physiology	Lowest BP / SpO2 / temperature: ____ Peak lactate / base deficit: ____ Calcium / fibrinogen monitored: Y / N
Imaging	eFAST: ____ CT order / start / report: ____ Critical result communicated: ____
Source control	Decision: ____ Theatre / IR / transfer time: ____ Reason for delay: ____
Outcome	Disposition: ____ Complication / missed injury / return: ____ Mortality: ____
Learning	Case review required: Y / N Actions, owner and completion date: ____

Annex 8. Local configuration checklist before approval

- ☐ Named 24/7 trauma / general surgery, anaesthesia, orthopaedic, urology, obstetric, paediatric, radiology / IR, cardiothoracic / vascular, critical-care and transport contacts.
- ☐ Approved decompression and chest-drain techniques, device sizes, competence framework, sedation / analgesia monographs, imaging confirmation and drain-removal policy.
- ☐ Massive-haemorrhage packs / whole blood, TXA, calcium, fibrinogen / cryoprecipitate, reversal agents, warming and viscoelastic-testing pathway.
- ☐ Pelvic binder sizes and storage; local source-control sequence for packing, external fixation, angioembolization, REBOA and transfer.
- ☐ Trauma CT protocol including arterial / portal venous / delayed phases, cystography, image transfer and after-hours reporting.
- ☐ Antibiotic and tetanus policy for penetrating thoracic / abdominal injury, chest drains, open pelvic injury, hollow-viscus contamination and open fractures.
- ☐ Observation frequency, non-operative solid-organ criteria, serial haemoglobin / examination plan, repeat imaging and rescue triggers.
- ☐ Pregnancy, paediatric, safeguarding, forensic evidence, violence intervention, consent / capacity, death and family-support pathways.
- ☐ Defined audit dashboard, simulation schedule, equipment check, serious-incident review and re-approval date.