Management of Acute Trauma

Clinical Principles and Surgical Judgment

Based on Sabiston Textbook of Surgery, 22nd edition
Chapter 36, beginning on printed page 301

Source chapter authors
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Section 1. Principles, team preparation, and initial assessment

A practical framework for anticipating resource needs, identifying life-threatening injury, coordinating simultaneous action, and revising decisions as physiology changes.

Component	Learning focus
Preparation	Team roles, equipment, blood availability and a prearrival shared plan.
Initial assessment	xABCDE as a priority framework with immediate treatment and repeated review.
Decision-making	Physiology, diagnostic uncertainty, imaging risk and early transfer planning.
Applied judgment	Two extended cases with model reasoning and explicit reassessment.

Source passages reviewed: Sabiston Chapter 36, printed pp. 301-303, 308-314 (supplied PDF pp. 648-650, 655-661). Core preparation and initial-survey material: pp. 313-314. Tables and cases are original educational synthesis. Contemporary ACS and NICE guidance is identified separately.

Cumulative chapter: Sections 1-10. Section 2 adds airway management and cervical protection. Subsequent sections will be added to this independent document. Detailed airway, chest, hemorrhage, neurological, imaging and definitive-injury management follow in later sections.

1. Principles of the initial trauma response

1.1 Treat physiological danger before completing anatomical diagnosis

The initial task is to identify and treat threats that can kill before a complete diagnosis is available. Sabiston emphasizes that urgent care should not wait for a definitive diagnostic label or a detailed history. The assessment must therefore produce timely action, not merely a list of possible injuries. [1]

Use mechanism, prehospital findings, examination and the response to treatment to develop a working explanation. Keep dangerous alternatives visible. A recognizable injury does not exclude another injury, and a reassuring single observation does not establish sustained stability.

Principle	Meaning at the bedside
Priority follows threat	Treat the problem most likely to cause immediate death, not necessarily the most visually dramatic injury.
Assessment and treatment overlap	Once an immediate threat is identified, begin appropriate treatment while other team members continue essential assessment.
Diagnosis remains provisional	Choose interventions justified by the current evidence, then revise the explanation when the response or new information disagrees.
Physiology determines urgency	Use trajectory, support requirements and organ findings rather than one acceptable pressure or saturation.
Definitive care remains the objective	Resuscitation supports the patient while hemorrhage, obstruction or another anatomical threat is controlled.

1.2 A system supports the first bedside decision

Trauma care links prehospital triage, hospital readiness, surgical and interventional capability, critical care, and rehabilitation. The local team must know what it can deliver now and what requires transfer. A designation or an available scanner is not the same as immediate access to every definitive intervention. [1]

Clinical pearl
The first correct treatment can still fail if definitive care is delayed. Identify the likely destination and resource gap early, then update that plan as the patient changes.

Team readiness before the patient arrives

1.3 Convert the prealert into an actionable prebrief

Use prehospital notification to establish expected injury pattern, physiology, treatments, response and arrival time. Missing information should be identified without postponing preparation. Anticipate likely airway, hemorrhage, chest and neurological needs, and prepare an alternative if the first plan fails. [1]

Readiness domain	Practical preparation
People and leadership	Identify the leader, airway clinician, procedural/assessment staff, nurses, recorder and runner; clarify local capabilities and backup.
Airway and ventilation	Check oxygen, suction, ventilation equipment, monitoring, primary airway tools and rescue capability.
Hemorrhage and access	Prepare direct-control supplies, vascular access, blood sampling, emergency blood pathway, warming and rapid delivery resources.
Monitoring and examination	Ensure working pressure, ECG, saturation and temperature monitoring; prepare ultrasound when available and appropriate.
Definitive care	Alert the relevant operating/interventional teams; assess actual readiness and initiate transfer discussions when needed.
Environment	Use protective equipment, arrange access around the patient, reduce noise and prepare warming without obstructing urgent exposure.

1.4 Assign ownership, not just tasks

Each task needs an identified person, expected report and escalation route. “Someone call blood bank” leaves uncertainty; a named role should confirm contact, the requested pathway and any delay. If the leader must perform a procedure, explicitly transfer oversight of the overall resuscitation.

Preparation should fit the likely problem and local resources. A small team may combine roles, but must still identify who maintains the broad view while another person is occupied. Unavailable expertise should trigger a backup plan rather than an assumption that it will arrive in time.

Clinical pearl
A prepared room is more than stocked equipment: it is a team that knows who will do what, what may fail, and how definitive help will be obtained.

Handover, communication, and situational awareness

1.5 Receive information without losing immediate care

A concise arrival handover should capture mechanism and time, suspected injuries, physiological trends, treatments, response and important unresolved concerns. Use a structured format such as MIST or the local equivalent. A patient with an immediate threat may need action during handover; assign a clinician to receive and confirm the remaining information rather than abandon it.

Communication problem	Useful countermeasure
An instruction has no owner	Direct it to a named person or role.
A request is heard ambiguously	Use a concise explicit action and clarify the intended goal.
A task is assumed complete	Require read-back and a completion or failure report.
A critical finding stays local	Announce the finding and its implication to the leader and team.
The team follows an obsolete plan	Give a brief shared update after a major change, intervention or decision.
Hierarchy suppresses a concern	Invite challenge and acknowledge information that conflicts with the working explanation.

1.6 Protect the broad view

The leader synthesizes simultaneous findings, prioritizes action and recognizes when a procedure or striking injury has captured the team's attention. Closed-loop communication is a reliability tool, not a ceremonial repetition. Report failed access, ineffective treatment and unavailable resources as promptly as success. [1]

Use short decision-directed pauses when feasible: what threatens life now, what has been treated, what remains unexplained, and what is the next destination? A pause must not interrupt a time-critical lifesaving action. Documentation should record timing and response, not just that a procedure occurred.

Clinical pearl
A resuscitation can look busy while its principal threat remains untreated. Ask whether the current tasks are shortening time to effective control.

xABCDE: a dynamic priority framework

1.7 Survey and intervene together

The initial survey is structured to recognize immediately dangerous physiological problems. Sabiston uses xABCDE, with catastrophic external hemorrhage addressed before the traditional sequence when present. ACS ATLS 11 confirms this emphasis. This is a priority framework rather than a demand that a multidisciplinary team perform every task serially. [1,2]

Priority	Focused assessment	Immediate decision
x: exsanguinating external bleeding	Rapidly identify uncontrolled external loss.	Apply appropriate direct control while other essential work proceeds; confirm that control is effective.
A: airway with cervical protection	Assess patency, voice, obstruction and ability to protect/maintain the airway.	Support oxygenation/ventilation and escalate airway care when needed, with indicated spinal-motion protection.
B: breathing	Assess effort, chest movement, air entry and oxygenation/ventilation.	Identify and treat a time-critical thoracic or ventilatory threat.
C: circulation	Assess perfusion, bleeding sources, pressure/heart-rate trends and response.	Obtain access and appropriate resuscitation while pursuing hemorrhage or other cause control.
D: disability	Assess consciousness, pupils and relevant neurological findings.	Identify deterioration and reversible contributors; document findings and escalate neurological concerns.
E: exposure/environment	Expose enough to identify injury while controlling the environment.	Prevent heat loss and missed injury; re-cover and warm as assessment proceeds.

Do not let one letter obscure another concurrent threat. Catastrophic external loss can be controlled by one team member while an airway clinician manages obstruction. Details of individual procedures require the subsequent sections and the trained local pathway.

Clinical pearl
Completion of the mnemonic is not proof of stability. Reassess the threatened function and the effectiveness of treatment before moving on.

Adjuncts and the decision to leave the resuscitation area

1.8 Order a test for a decision it can change

Monitoring, focused ultrasound, selected radiographs and laboratory testing can refine the explanation and guide treatment. Their role is to support an urgent clinical decision, not to create a mandatory checklist before action. Distinguish a result that can redirect care now from one that only adds detail.

Adjunct / observation	Useful contribution	Limit
FAST / focused ultrasound	Can identify findings that support rapid decisions in the appropriate context.	A negative result does not exclude all important bleeding compartments or injuries.
Hemoglobin	Provides baseline and serial concentration information.	An initially plausible value does not exclude acute major hemorrhage.
Lactate / base deficit	Supports assessment of physiological stress and trajectory.	Not a stand-alone anatomical diagnosis or automatic fluid order.
Pressure / heart rate	Tracks circulation and support response.	Compensation, drugs, pacing and age can blunt expected abnormalities.
CT	Provides anatomical information that can redirect definitive care in suitable patients.	Transfer, delay and access to the patient can be unsafe in persistent instability.

1.9 Stability is a trajectory, not a snapshot

A brief pressure response followed by deterioration is different from sustained improvement without escalating support. Before CT, ask whether circulation, airway and ventilation can be supported safely during transport and scanning, whether the result changes immediate treatment, and what happens if the patient worsens. In persistent hemorrhagic instability without response, limit imaging to what directs intervention. [3]

This does not mean CT is never appropriate after injury. It means the diagnostic route is chosen from physiology, likely pathology, time and the available definitive options. Avoid an anatomical information detour that delays treatment of an already convincing immediately lethal cause.

Clinical pearl
A negative FAST and a single acceptable pressure cannot certify that an injured patient is safe to leave direct resuscitation and control capability.

Repeat the primary survey and plan definitive care

1.10 Reassessment begins before the first survey ends

Repeat the primary assessment after an important intervention, after deterioration, and when the clinical trajectory changes. A new problem may be injury-related, treatment-related, or an unrecognized second mechanism. Recheck access, monitoring and device function as well as anatomy and physiology. [1]

Trigger	Reassessment question
After airway intervention	Is placement/function confirmed by the appropriate method, is ventilation effective, and has circulation deteriorated?
After pleural treatment	Did respiratory and circulatory findings improve, and is definitive pleural management adequate?
After blood / fluid support	Was benefit sustained, is bleeding still occurring, and has treatment added congestion or another complication?
After a procedural or transport event	Could a new mechanical, delivery or monitoring problem explain the change?
Before secondary survey	Are immediate threats controlled sufficiently for a more detailed assessment?
Before transfer	What treatment is essential before departure, what capability is missing, and what can be supported en route?

1.11 Do not delay transfer for completeness

When required definitive capability is absent, begin coordination early. Provide essential stabilization and realistic transport support, communicate unresolved threats and treatments, and avoid tests that will not change pretransfer care. A transfer decision remains a clinical judgment: a patient may require an immediately available local intervention before a longer journey.

Once immediate threats are addressed and resuscitation permits, proceed to the secondary survey and indicated adjuncts. That transition does not end primary-survey vigilance. Subsequent deterioration returns the team to immediate threats rather than continuing a detailed examination by habit.

Clinical pearl
A good transfer is a continuation of care with explicit responsibility, physiological support and contingency planning, not simply a destination request.

Extended case: a reassuring number and an unsafe detour

1.12 Interpret a transient responder

A 32-year-old man arrives after a high-speed collision. Prehospital staff report initial pressure of 78/44 mm Hg, improved briefly after emergency support, followed by recurrent deterioration. He is speaking but restless. A large lower-limb wound is bleeding and pelvic injury is suspected. On arrival pressure is 104/62, heart rate 116/min and saturation 97% on oxygen. Hands are cool. The first FAST is negative and hemoglobin is 12.4 g/dL. A resident requests immediate whole-body CT because the latest pressure and scan appear reassuring. The airway clinician is assessing the patient while nursing staff struggle with access. Blood is available through the emergency pathway. CT requires a transfer away from the resuscitation room; the operating and interventional teams have not yet been alerted.

During handover, pressure falls again, the patient becomes less interactive, and external wound loss continues. The trauma leader is helping with an access procedure and no one is synthesizing the new findings. The team is performing many tasks, but definitive hemorrhage resources are not moving toward the patient.

Model judgment

Restore priority and leadership: Assign or resume overall coordination. Direct a named clinician to control external loss immediately, while airway/breathing assessment, access and appropriate blood support proceed in parallel. Confirm task completion and response.

Reject false reassurance: This is recurrent instability, not sustained recovery. Negative FAST does not exclude pelvic/retroperitoneal bleeding and early hemoglobin does not rule out major loss. Continue the source search without delaying control of known bleeding.

Change the route: Mobilize surgical, anesthesia, blood-bank and interventional capability now. Reassess whether any imaging is necessary and safe to direct immediate treatment; a routine CT detour is not justified by the earlier snapshot. Follow the local pelvic/control pathway and maintain indicated stabilization.

Reassess: Repeat xABCDE, monitor perfusion and treatment tolerance, prevent cooling and document the response and next control decision. Reopen the plan if an initial intervention fails.

Clinical pearl
The important question is whether the patient remains improved without increasing support, not whether one transient pressure crossed a familiar threshold.

Extended case: capacity limits and a missed neurological trajectory

1.13 Early transfer planning without abandoning immediate care

An 81-year-old woman is brought to a small hospital after a fall down stairs. She takes an anticoagulant and a beta blocker. Initial pressure is 132/74 mm Hg and heart rate 76/min. She is confused but speaks clearly; one forearm is deformed and painful. There is no obvious large external wound. The available team consists of an emergency clinician, surgeon, two nurses and a respiratory practitioner. CT is available, but there is no neurosurgical service and overnight blood-product access is limited. A resident focuses on reducing and splinting the forearm and attributes confusion to age and distress. The prehospital report, not yet reviewed fully, describes a decline in responsiveness during transport.

During assessment she becomes more drowsy and vomits. Saturation remains satisfactory on oxygen. The receiving trauma center can advise and accept transfer, but travel is substantial. The team must decide what can safely occur locally, what cannot wait and which investigations or treatments would actually change the immediate plan. The normal first pressure and heart rate have not explained the neurological trajectory.

Model judgment

Return to immediate threats: Reassess airway protection, ventilation, circulation and neurological findings promptly. Do not let a conspicuous fracture displace the evolving threat. Escalate to the most experienced available airway support when indicated; normal saturation does not prove safe airway protection.

Use history that changes risk: Establish the neurological trend and anticoagulant details, while evaluating for associated injuries and bleeding. Do not attribute new confusion or declining consciousness to baseline age without evidence.

Coordinate early: Contact the receiving trauma/neurosurgical pathway and transport service now. Determine whether local imaging can be obtained safely and will change urgent treatment, including agent-specific reversal decisions through the relevant protocol. Neither exhaustive local testing nor an unsupported immediate departure is an adequate default.

Prepare a supported transition: Clarify the essential predeparture actions, staff/equipment for transport, escalation if the airway or circulation worsens, and the destination handover. Record time, serial neurological examination, treatments and response. Continue the primary-survey loop while transfer is arranged.

Clinical pearl
A resource gap should be recognized while the patient is still supportable. Early transfer coordination creates options; waiting for collapse removes them.

Section 1: final review and sources

1.14 The first assessment should produce these decisions

Question	Required output
What is the immediate threat?	A prioritized working explanation, including dangerous alternatives.
What action cannot wait?	Named ownership of immediate treatment and a report of effectiveness.
What is happening in parallel?	Airway/breathing support, bleeding assessment, access, monitoring and resource activation as needed.
Is the patient actually improving?	A trajectory integrating examination, support requirements and response, not one numerical target.
What test changes the next action?	A safe, decision-directed adjunct rather than automatic completion of imaging.
Where is definitive care available?	A local control or transfer plan based on actual capability and time.
When do we reassess?	After important interventions and any deterioration, with clear responsibility.

Errors to recognize

Fixation on a visible injury; treating a transient pressure response as stability; excluding hemorrhage from hemoglobin or FAST; accepting an unconfirmed task as completed; proceeding to CT because it is available; waiting for a full history before urgent treatment; and delaying transfer coordination until local options are exhausted.

Sources and educational scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. In: Sabiston Textbook of Surgery. 22nd ed. Chapter 36, beginning p. 301. Core passages: printed pp. 313-314; contextual trauma-system and prehospital material pp. 301-303 and 308-312. The tables, pathway and cases are original synthesis, not reproduced textbook figures.

[2] American College of Surgeons. ATLS 11; Trauma Care Gets Major Upgrade with Launch of ATLS 11, 16 September 2025. Official update confirms the xABCDE emphasis on rapid control of exsanguinating external hemorrhage. https://www.facs.org/quality-programs/trauma/education/advanced-trauma-life-support/atls-11/.

[3] NICE. Major trauma: assessment and initial management. NG39, imaging recommendations 1.5.29-1.5.30 and related management guidance. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Used selectively for decision-directed imaging in persistent instability and limitations of a negative FAST. Sources checked 2 November 2026.

Next section: Airway assessment, airway management and protection of the cervical spine. Exact procedures, drug selection and injury-specific thresholds are developed in subsequent sections and require the appropriate trained local pathway.

2. Airway and cervical spine protection

2.1 Determine whether the airway is adequate now and likely to remain so

Evaluate airway patency, protection, oxygenation, ventilation and the anticipated course. A patient who can speak offers useful immediate information, but speech does not guarantee continuing protection from blood, vomit, progressive swelling or neurological deterioration. The airway decision is a trajectory assessment, not a single saturation or consciousness threshold. [1]

Question	Findings that change the plan
Is the airway open?	Obstruction, noisy breathing, blood/vomit, deformity, foreign material or progressive swelling.
Can the patient protect it?	Declining consciousness, ineffective cough, recurrent vomiting, inability to handle secretions or ongoing contamination.
Is gas exchange adequate?	Respiratory effort, chest movement, oxygenation and ventilation; fatigue or apnea despite an apparently open airway.
Will it remain adequate?	Evolving neck/facial injury, inhalational exposure, neurological decline, planned procedures or a long transfer.
What makes intervention hazardous?	Distorted anatomy, blood obscuring the view, restricted mouth opening, suspected spinal injury, shock and limited rescue capability.

2.2 A low GCS is a warning, not the whole decision

Markedly reduced consciousness, commonly GCS 8 or less, strongly raises concern about airway protection and ventilation. Assess the component examination, reversible contributors and trend. Conversely, a higher score does not exclude an airway that is obstructing or failing to handle ongoing contamination. Do not wait for a particular score in a patient with an immediate functional threat.

When major trauma prevents maintenance of airway or ventilation, definitive control is generally drug-assisted tracheal intubation by appropriately trained staff. Assessment, immediate support and preparation occur together; the need for a definitive airway does not justify an unprepared attempt. [2]

Clinical pearl
Normal saturation can coexist with an unsafe airway or inadequate ventilation, particularly while supplemental oxygen is being given.

Immediate support and the contaminated airway

2.3 Preserve oxygenation while organizing definitive control

Call experienced airway assistance early, assign roles and provide appropriate oxygen and ventilation support. Clear accessible contamination with suction and use suitable basic maneuvers and adjuncts according to consciousness, injury pattern and local practice. In suspected cervical injury, minimize unnecessary movement; jaw thrust is generally preferred to routine head tilt when a simple opening maneuver is needed. [3]

Problem	Useful principle	Limitation
Blood or vomit	Prepare effective suction and a contamination plan before the attempt.	An excellent device cannot provide a view through uncontrolled contamination.
Poor mask seal / facial disruption	Use trained assistance, appropriate adjuncts and an alternative oxygenation plan.	Do not assume mask rescue will be easy after induction.
Reduced airway reflexes	Use appropriate bridging support while definitive care is arranged.	A supraglottic device does not offer the same aspiration protection as a correctly placed cuffed tracheal tube.
Possible skull-base or major midface injury	Consider whether nasal instrumentation is appropriate before using it.	Do not choose a nasal route automatically from habit.
Evolving swelling / neck injury	Mobilize airway and surgical expertise before options narrow.	Repeated traumatic instrumentation can worsen the situation.

2.4 Choose a bridge deliberately

A supraglottic airway can restore oxygenation in suitable patients after failed intubation or when immediate definitive intubation is not feasible. Use a familiar available device and assess whether ventilation is actually effective. Significant contamination, disrupted anatomy or persistent inadequate oxygenation may defeat it. A bridge requires reassessment and a continuing definitive plan, not an assumption that risk has ended.

When bag-mask support is needed, optimize seal and airway opening with adequate assistance while minimizing unnecessary cervical movement. If a protective maneuver obstructs effective oxygenation, adapt it with skilled support rather than accept ongoing hypoxia. The goal is protection of both brain and spinal cord through effective resuscitation.

Clinical pearl
Before induction, ask whether the fallback can oxygenate this particular patient. “We have a mask” is not evidence that mask rescue will work.

The anatomically and physiologically difficult airway

2.5 Two forms of difficulty can coexist

Anatomical difficulty concerns access, visualization and tube delivery. Physiological difficulty concerns the patient's ability to tolerate induction, apnea and positive-pressure ventilation. A technically successful first pass can still be followed by cardiovascular collapse if the second problem was ignored. [1]

Hazard	Planning response
Hemorrhagic shock / poor effective filling	Pursue hemorrhage control and appropriate blood-based support in parallel; prepare a response to peri-intubation hypotension.
Severe hypoxemia	Optimize preoxygenation and available rescue oxygenation; minimize interruption and ineffective attempts.
Severe metabolic acidosis	Anticipate dependence on high minute ventilation; avoid prolonged apnea and plan adequate safe postintubation ventilation.
RV failure / obstructive physiology	Assess whether induction and positive pressure may worsen venous return or RV loading; treat an immediately reversible cause.
Traumatic brain injury	Avoid preventable hypoxemia and hypotension; coordinate neurological, airway and circulatory priorities.
Contaminated / distorted anatomy	Use the most appropriate experienced operator, effective suction and explicit alternative access plans.

2.6 Resuscitation before induction is goal-directed, not a delay ritual

If time permits, improve circulation and oxygen reserve before inducing apnea. Do not impose an arbitrary volume requirement or postpone an immediately necessary airway until every laboratory value normalizes. Conversely, a brief achievable stabilization can matter greatly in a profoundly depleted patient. Assign another clinician to hemorrhage and circulation while the airway team prepares.

Select induction and neuromuscular-blocking drugs from the current physiology, contraindications and trained local protocol. No agent guarantees hemodynamic stability; shock can alter requirements and responses. A paralytic does not provide sedation or analgesia. Ensure ongoing postintubation medication is prescribed before prolonged paralysis hides distress. Exact doses require patient-specific assessment rather than copying an elective regimen.

Clinical pearl
Airway success has two endpoints: effective gas exchange and a patient whose circulation survives the intervention.

Preparation, first-pass strategy and failure planning

2.7 Brief the plan that will actually be used

Preparation element	Decision to make explicit
People	Who leads the attempt, assists, manages drugs, supports circulation and maintains the overall trauma view?
Primary approach	Which technique fits injury, contamination, spinal precautions, expertise and equipment?
Oxygen reserve	How will preoxygenation and ventilation be optimized, and what ends an attempt early?
Equipment	Are suction, primary device, tube adjuncts, rescue devices, capnography and emergency front-of-neck equipment ready?
Failure path	What changes after an unsuccessful attempt, how is oxygenation restored, and who performs rescue access if needed?
Aftercare	Who confirms placement, secures the tube, checks pressure/ventilation and provides sedation/analgesia?

Videolaryngoscopy is favored where possible for intubation with suspected or confirmed cervical injury, using appropriate expertise; no single blade is universally best. Blood, vomit and access limitations can change the effective technique. An available unfamiliar device is not automatically superior to a planned approach the operator can use reliably. [3]

2.8 Do not repeat an unchanged failing attempt

After failure, restore oxygenation, call or escalate assistance, and identify what must change: operator, view, suction, adjunct, positioning, device or strategy. Repeated attempts consume oxygen reserve, cause trauma and can make later rescue harder. Follow the local difficult-airway attempt limits and declare failure clearly rather than allowing task fixation.

If intubation fails but oxygenation is adequate, use the rescue pathway and reconsider the definitive strategy. If intubation and oxygenation fail, declare the emergency and proceed promptly to the trained emergency front-of-neck access pathway. Do not continue laryngoscopy while an uncorrected oxygenation failure progresses. Technique selection and age-specific procedural details require dedicated training and local protocols.

Clinical pearl
The rescue plan should be executable before the first drug is given. Waiting for failure to locate equipment or assign a rescue operator wastes the remaining reserve.

Cervical protection during airway intervention

2.9 Minimize harmful movement without compromising lifesaving care

Suspected cervical injury requires a coordinated movement-minimizing strategy during airway support and intubation. Protection is more than leaving a rigid collar in place: the collar can restrict mouth opening and obstruct access. Document relevant neurological findings before drugs when feasible, without delaying emergency treatment.

Current multisociety guidance advises removal of the semi-rigid/rigid collar during intubation attempts, commonly by removing its anterior part, with coordinated support and minimization of movement. Use the local spine/airway pathway and adequate assistance. Do not apply traction or force alignment against resistance or a patient-specific deformity. [3]

Situation	Judgment
Collar restricts mouth opening	Plan supported anterior opening/removal rather than repeated poor-access attempts.
Movement-restricting assistance worsens access	Communicate and adapt with the experienced operator; do not accept persistent failed oxygenation in the name of a fixed maneuver.
Known deformity / pain with positioning	Respect the individual anatomy; avoid forced neutral alignment.
Unreliable examination	Maintain indicated precautions pending an appropriate clearance pathway.
Immediate airway threat before imaging	Treat the airway with appropriate protection; do not wait for spinal imaging to permit lifesaving care.

2.10 Airway protection is not spinal clearance

Successful intubation does not exclude cervical injury. Conversely, no neck pain or movement during an unreliable examination does not establish clearance. Clinical clearance tools apply only to their validated populations and conditions; intoxication, reduced consciousness, neurological deficit or other limitations can invalidate a simplistic bedside conclusion.

Use the local trauma/spinal imaging and specialist pathway to determine clearance, continued precautions and further assessment. A neurological deficit needs explanation even when an initial scan appears reassuring. Do not generalize one imaging rule to every age group, injury pattern or examination. Detailed spinal-injury assessment follows later in the chapter.

Clinical pearl
The safe objective is an oxygenated, perfused patient with unnecessary spinal movement minimized. A device or maneuver is a means to that objective, not an endpoint.

Confirmation, aftercare and sudden deterioration

2.11 Confirm function, then keep confirming it

Use sustained exhaled carbon dioxide on waveform capnography to confirm and continuously monitor tracheal placement alongside clinical assessment. Visual passage, chest movement, air entry and tube depth contribute, but a chest radiograph does not replace immediate capnographic confirmation. Reassess after movement, transfer and a new physiological change. [1]

Absent or equivocal carbon dioxide after intubation demands an immediate structured check of placement, ventilation and equipment. Very low pulmonary flow can reduce the signal, but that possibility must not become a convenient assumption that hides esophageal placement. If placement cannot be confirmed promptly, follow the emergency airway pathway while restoring effective oxygenation.

Postintubation change	Consider promptly
Hypoxemia / poor ventilation	Tube displacement or obstruction, mainstem position, equipment failure, aspiration and a new/worsening thoracic problem.
Abrupt hypotension	Induction effects, hemorrhage, impaired venous return, tension pneumothorax and other evolving shock mechanisms.
Rising airway pressure / unilateral findings	Tube depth, obstruction, bronchospasm and pleural pathology; reassess the patient and circuit.
New low CO2 signal	Placement/connection problems or severely reduced pulmonary flow in context.
Apparently quiet patient under paralysis	Check sedation, analgesia and awareness prevention; absence of movement is not comfort.

2.12 Close the loop before leaving the room

Record technique, confirmation, depth, fixation, complications, physiology and drugs. Recheck oxygenation, ventilation, pressure, neurological implications and ongoing hemorrhage needs. Prescribe continuing sedation/analgesia and a transport plan with monitoring and rescue capability. Intubation treats one component of the primary survey; it does not establish source control or readiness for unmonitored transfer.

Clinical pearl
New collapse after intubation is a diagnostic event. Do not attribute it automatically to the sedative or reflexively prescribe fluid without reassessing tube, chest and circulation.

Extended case: facial injury, hemorrhage and spinal risk

2.13 Plan the airway and resuscitation together

A 34-year-old man arrives after a high-energy collision with facial disruption, blood pooling in the mouth and a rigid cervical collar. He speaks in short phrases but repeatedly coughs blood, becomes more agitated and needs increasing oxygen. Blood pressure is 78/46 mm Hg, heart rate 126/min and the pelvis is suspicious for injury. Mouth opening is limited by the collar and pain. A resident considers speech proof that intubation can wait until after CT. Another prepares an elective-dose induction without confirming suction, rescue equipment or blood availability. The airway clinician anticipates both a poor view and difficult mask ventilation. There is no completed cervical scan, and external hemorrhage control is underway.

Over the next minutes he becomes less able to clear secretions. The surgeon must decide whether current airway function is durable, how to reduce preventable induction-related collapse, and how spinal precautions should be integrated without making effective airway access impossible. Experienced anesthesia and a surgical rescue operator can be mobilized immediately.

Model judgment

Recognize deterioration: Speech does not establish a protected airway in continuing contamination and declining function. Escalate experienced airway support now; a CT detour and spinal imaging must not delay a necessary airway intervention.

Prepare for both difficulties: Assign suction, preoxygenation/ventilation, primary and rescue strategies, drugs and monitoring. Anticipate that mask or supraglottic rescue may be impaired by facial injury. Have emergency front-of-neck capability ready through the trained pathway.

Resuscitate in parallel: Mobilize blood-based support and hemorrhage control, assess the chest and prepare for peri-induction hypotension. Do not use an arbitrary large crystalloid load or assume one induction drug removes the physiological risk.

Coordinate cervical access: Adapt collar access with supported anterior removal/opening as appropriate and minimize movement. Do not force alignment or allow rigid adherence to a device to prevent oxygenation. Confirm tube placement with sustained waveform capnography, secure it and reassess xABCDE and continuing medications.

Clinical pearl
The decision is not “airway or circulation.” In this patient, both need coordinated action, with a primary and rescue plan that fits the actual anatomy.

Extended case: intubation succeeds, the patient collapses

2.14 Reopen the primary survey immediately

A 62-year-old woman is intubated after blunt trauma because of declining consciousness and vomiting. A sustained capnographic waveform is obtained and the tube is secured. Soon after positive-pressure ventilation begins, pressure falls sharply, oxygen saturation decreases and airway pressure rises. Air entry is much quieter on the right. She has a chest injury and had received only limited circulatory support. A resident attributes the entire change to induction drugs and requests repeated crystalloid. Another wants an immediate CT because initial tracheal placement was confirmed. The trauma leader must decide which checks occur now and what should be treated without waiting for delayed imaging.

The waveform remains present but CO2 is lower than immediately after intubation. The tube could have moved, a mechanical ventilatory problem could be present, and tension physiology or continuing hemorrhage remain plausible. Successful airway placement has not made the subsequent thoracic or circulatory findings irrelevant.

Model judgment

Reassess airway and equipment: Confirm current depth, fixation and patency, ventilation/circuit function and capnography. Initial confirmation does not exclude later displacement or obstruction; right-sided findings cannot be interpreted without a current examination.

Act on a plausible lethal chest cause: In this unstable compatible setting, tension pneumothorax requires urgent assessment and emergency treatment by a trained clinician when clinically suspected. Do not wait for CT. Airway/equipment checks and chest action proceed in parallel.

Preserve the circulation differential: Induction effects and reduced venous return may contribute, but do not exclude hemorrhage or obstruction. Provide appropriate support while identifying the mechanism rather than treating all collapse with repeated crystalloid.

Interpret the response: Improvement after a chest intervention supports that contribution but does not erase other injuries. Repeat the primary survey, review bleeding, ventilation targets, sedation/analgesia and safe destination planning. A falling CO2 signal may reflect lower pulmonary flow as well as airway problems and requires contextual interpretation.

Clinical pearl
“The tube was confirmed” is a historical fact. The next decision depends on whether the airway, ventilation and circulation are effective now.

Section 2: final review and sources

2.15 A decision checklist for trauma airway management

Before / during / after	Required reasoning
Indication	What is failing now, what is likely to worsen, and why is current support insufficient?
Preparation	Who performs the attempt, who supports physiology, and what rescue will actually work?
Cervical protection	How will unnecessary movement be minimized without obstructing oxygenation and access?
Induction	How will shock, hypoxemia, acidosis and loss of spontaneous ventilation be managed?
Failed attempt	What ends the attempt, restores oxygenation and changes the next approach?
Confirmation	Is sustained waveform CO2 present and is current tube position/function credible?
Continuing care	Are ventilation, perfusion, fixation, sedation/analgesia and transport support appropriate?
Clearance	Has the spine been assessed through a valid separate pathway rather than assumed clear?

Sources and scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery. 22nd ed. Chapter 36. Airway and physiological preparation passages, printed pp. 308 and 316-318 (supplied PDF pp. 655 and 663-665), integrated with the primary-survey principles in Section 1. Tables and cases are original teaching synthesis.

[2] NICE. Major trauma: assessment and initial management. NG39, recommendations 1.2.1-1.2.2: definitive airway for inability to maintain airway/ventilation and rescue after failed RSI. https://www.nice.org.uk/guidance/ng39/chapter/recommendations.

[3] Wiles MD, et al. Airway management in patients with suspected or confirmed cervical spine injury: multidisciplinary guidelines. Anaesthesia. 2024. doi:10.1111/anae.16290. Official recommendation summary: https://das.uk.com/guidelines/cervical-spine-injury/. Used for movement minimization, device/access choices and team planning. The evidence supporting many recommendations is modest; technique and protection require individualization.

Supplementary guidance verified 2 November 2026. This adult educational section addresses judgment and team preparation; procedural execution, drug doses, pediatric rescue and detailed cervical clearance require dedicated training and the appropriate local pathway.

Next section: Assessment of breathing and life-threatening thoracic injuries.

3. Breathing and immediately threatening chest injuries

3.1 An open airway does not establish effective breathing

After assessing and supporting the airway, determine whether ventilation, oxygenation and thoracic mechanics are adequate. Chest injury can also cause shock through obstruction to venous return or hemorrhage. Airway, breathing and circulation therefore overlap: treating one component does not establish that the others are satisfactory. [1]

Assessment	Decision-relevant observations
Look	Work of breathing, respiratory rate, chest symmetry, wounds, paradoxical movement, cyanosis and altered consciousness.
Listen	Compare air entry; assess the patient and ventilator/circuit when intubated.
Feel	Tenderness, instability, subcutaneous emphysema and chest-wall movement; examine safely without unnecessary spinal motion.
Measure	Saturation, capnography when applicable, pressure, pulse and the trajectory of support; obtain gases when they change care.
Reassess	Repeat after an airway or pleural intervention and after deterioration, transport or a ventilation change.

3.2 Read the trajectory and the mechanism

Reduced unilateral air entry can reflect pleural air, pleural blood, mainstem intubation, obstruction, major airway injury, contusion or diaphragmatic injury. It is a clue rather than a diagnosis. In an unstable patient, rapidly distinguish conditions requiring immediate mechanical treatment from those needing supportive care and further investigation. [1]

Inspect accessible chest surfaces and identify wounds while preserving warmth and indicated spinal precautions. A posterior injury may be missed if the examination never extends beyond the anterior chest. Coordinate movement and timing with the team; a detailed turn must not delay an immediately necessary lifesaving intervention.

Clinical pearl
Assess the chest and the circulation together. Respiratory deterioration with shock may reflect a mechanically reversible thoracic problem, not simply a need for more oxygen or fluid.

Tension pneumothorax: recognize physiology and act

3.3 Do not wait for every classic sign

Suspect tension physiology when compatible chest injury or a procedure is followed by marked respiratory compromise and/or hemodynamic collapse, especially with unilateral reduced air entry. In a ventilated patient, rising airway pressures and abrupt deterioration are important clues. Neck-vein distension may be absent with blood loss, and tracheal deviation is a late or difficult sign. [1]

When clinical suspicion and instability or severe respiratory compromise warrant emergency treatment, decompress promptly through the trained local pathway rather than waiting for imaging. Needle decompression can be a temporizing option; open/finger decompression with subsequent appropriate drainage may be used by trained clinicians in the relevant setting. The selected approach depends on expertise, equipment and urgency. [1,2]

After emergency decompression	What must be checked
Physiological response	Did oxygenation, air entry, airway pressure and circulation improve?
Durability	Is effective pleural drainage established and maintained?
Failure mechanism	Could access have failed, become obstructed or displaced, or failed to enter the pleural space?
Alternative / additional cause	Reassess tube position, equipment, hemorrhage, contralateral pathology and other shock mechanisms.

3.4 An unsuccessful first maneuver does not settle the diagnosis

If there is no improvement, verify the intervention and reopen the differential. A blocked or ineffective decompression can leave the original problem untreated. Conversely, continued deterioration should not trigger endless identical procedures when the findings point elsewhere. Communicate what changed and what remains unexplained.

Positive-pressure ventilation can worsen an untreated pleural air problem. Anticipate that risk when preparing airway support in chest trauma, while treating a failing airway without harmful delay. Airway and chest clinicians should coordinate the sequence and rescue plan.

Clinical pearl
The emergency endpoint is effective relief of the physiological threat, followed by durable management and reassessment; performing a procedure is not itself proof of success.

Open pneumothorax and major airway disruption

3.5 Control the chest-wall communication without trapping pressure

An open pneumothorax allows air movement through a chest-wall defect and impairs effective ventilation. Provide appropriate oxygen and support while controlling the wound with a suitable vented seal or protocol-directed temporary dressing. Observe closely for tension after sealing, especially during positive-pressure ventilation. Worsening physiology requires immediate assessment of trapped pleural pressure and the dressing/drainage strategy. [1]

A temporary seal is not definitive pleural care. Arrange tube drainage through an appropriate separate site and definitive management of the wound according to injury and expertise. A simple airtight covering without a plan for air escape, monitoring and drainage can convert the problem into obstructive physiology.

3.6 Persistent large air leak needs an explanation

Finding	Consider	Next judgment
Large persistent air leak	Drain/circuit problem, lung injury or major tracheobronchial disruption.	Check the system and patient; do not assume all bubbling is the same process.
Failure of lung expansion despite apparently adequate drainage	Tube dysfunction/malposition, obstruction or major airway injury.	Verify drainage and involve thoracic/airway expertise promptly.
Poor ventilation with extensive emphysema	Major airway or lung injury, with potential competing tube/equipment problems.	Coordinate airway strategy and definitive investigation without repeated blind ineffective steps.

Bronchoscopy and specialist airway techniques may define and bridge a major airway injury. The optimal tube position and ventilation strategy depend on the lesion; repeated routine instrumentation can worsen the situation. Urgent support must be coordinated with definitive surgical capability. Detailed repair decisions belong to the injury-specific sections.

Clinical pearl
Persistent air leak plus ineffective ventilation is a clinical problem to solve, not merely a drain observation to record.

Massive hemothorax: ventilation and hemorrhage together

3.7 Decompression does not replace blood or hemostasis

A large pleural blood collection can impair ventilation while producing major circulatory loss. Consider it when reduced air entry and shock follow compatible injury. Bedside imaging can support the diagnosis when it does not delay necessary care. Mobilize appropriate drainage, blood-based resuscitation and definitive hemorrhage-control expertise in parallel. [1,3]

Clinical information	Interpretation
Initial large blood return	Signals significant thoracic hemorrhage and warrants immediate senior assessment and readiness for control.
Continuing brisk drainage	Interpret the rate with pressure, perfusion, product requirement and competing bleeding sources.
Little drainage despite shock	Does not exclude important retained blood or a blocked/malpositioned drain.
A temporarily improved pressure	Does not establish that ongoing intrathoracic bleeding has stopped.
Central penetrating trajectory	Consider associated cardiac or great-vessel injury; a pleural collection does not identify every injured structure.

3.8 Output thresholds are escalation triggers, not permission to wait

Large early output around 1500 mL, or persistent drainage around 200 mL/h over several hours, are commonly used warning thresholds for operative assessment. Definitions and observation windows differ between protocols. Hemodynamic instability, ongoing transfusion requirement or clear active bleeding can justify intervention before a numeric threshold is reached. Conversely, output must be checked for patency and interpreted in context. [3]

Select the drainage approach for urgency, blood burden and local expertise. A small catheter used successfully for a selected stable pleural air collection should not be generalized to every unstable massive hemothorax. Reassess residual collection, drainage function and the need for further intervention after initial stabilization.

Clinical pearl
The drain is both a treatment and an imperfect observation channel. A low recorded volume can reflect obstruction rather than hemostasis.

Chest-wall injury, contusion and evolving respiratory failure

3.9 Treat the patient, not the radiographic pattern alone

Rib fractures and an unstable chest segment can cause pain, splinting, ineffective cough and fatigue. Pulmonary contusion adds parenchymal injury and impaired gas exchange. These processes often coexist; the size of a visible flail segment does not by itself determine whether invasive ventilation is required. Early images can understate an evolving lung injury. [1]

Problem	Initial clinical response	Reassessment
Pain and splinting	Use appropriately titrated multimodal analgesia; consider regional options with relevant expertise and contraindication review.	Breathing effort, cough, alertness, oxygenation and treatment adverse effects.
Contusion-related gas-exchange impairment	Provide oxygen and support as indicated; avoid unnecessary fluid excess while maintaining perfusion.	Progression of hypoxemia, work of breathing and other pulmonary diagnoses.
Threatened ventilation / fatigue	Escalate respiratory support and airway assessment promptly.	Ability to protect the airway, clear secretions and sustain ventilation.
Selected stable cooperative patient	Noninvasive support may be considered with close monitoring and rescue readiness.	Failure must be detected early; do not use it to postpone necessary invasive control.

3.10 Recognize when a supportive strategy is failing

Increasing effort, declining consciousness, persistent hypoxemia/hypercapnia, exhaustion or inability to clear secretions can require escalation. Do not infer adequate ventilation from saturation alone. Noninvasive support is a poor fit for an unprotected airway, ongoing vomiting, severe instability or inability to cooperate.

If invasive ventilation is necessary, use a lung-protective strategy individualized to gas exchange, circulation and associated brain injury. Reassess the chest for a pleural problem before attributing every change to contusion. Avoid both uncontrolled fluid accumulation and withholding necessary circulation support from a bleeding patient.

Clinical pearl
An unstable chest-wall image is not an automatic intubation order; worsening physiological function is not a reason to wait for a more dramatic image.

Other thoracic threats and decision-directed imaging

3.11 Keep injuries outside the pleural space in view

Threat	Clues / concern	Judgment
Cardiac tamponade	Compatible penetrating/blunt mechanism with obstructive physiology; focused pericardial assessment.	Urgent expert control; absent classic signs or a limited negative view cannot exclude every traumatic cardiac injury.
Blunt aortic / major vascular injury	High-risk mechanism or trajectory, associated findings and unexplained hemorrhage.	Use appropriate vascular imaging when stable enough; a reassuring plain mediastinal appearance is not an exclusion test.
Diaphragmatic injury with herniation	Thoracoabdominal mechanism, unusual chest findings or failure of a simple pleural explanation.	Seek appropriate imaging/expertise when feasible; blind instrumentation of herniated viscera can add injury.
Esophageal injury	Compatible trajectory or clinical/imaging concern.	Requires targeted timely assessment; a completed primary survey does not exclude it.

3.12 Choose the next study from physiology

eFAST and a chest radiograph can rapidly inform the resuscitation when available and decision-relevant. Neither must delay treatment of a clinically convincing immediately lethal threat. CT is useful for defining injuries in a patient who can tolerate the journey and scan; it is not a mandatory detour before controlling persistent shock. [2]

Absent lung sliding is not specific to pneumothorax: ventilation, prior pleural disease, mainstem positioning and other conditions can affect the sign. Interpret multiple findings, technique and the clinical setting. A limited study should be described as limited, not reported as definitive exclusion.

Clinical pearl
One positive finding may explain part of the deterioration while another threat remains. Use imaging to answer the unresolved decision, not to replace it.

Reassessment after a chest intervention

3.13 Verify the result and anticipate complications

Immediately compare breathing, oxygenation, ventilation and circulation with the pretreatment state. Check drain position/function, tubing and collection system, and identify continuing air or blood loss. Repeat focused assessment or imaging as indicated. A chest intervention can improve one mechanism while hemorrhage, tube displacement or contralateral injury persists.

After treatment	Actionable question
No improvement	Was the intended problem present, and did the treatment reach and relieve it?
Brief improvement then recurrence	Has decompression or drainage failed, or is another source continuing?
New hypoxemia	Recheck airway/tube, ventilation, equipment, pleural findings and parenchymal causes.
New hypotension	Reassess hemorrhage, obstruction, drug effects and ventilation-related circulatory compromise.
Persistent air/blood loss	Is urgent operative, thoracic or endovascular assessment required?
Before transport	Can airway, ventilation, drainage and ongoing resuscitation be maintained safely with appropriate staff and monitoring?

A compact bedside sequence

Recognize threatened breathing or circulation. Support gas exchange and call for help. Reassess airway/device function and both sides of the chest. Treat a convincing time-critical pleural threat without a harmful imaging delay. Mobilize blood and definitive control when bleeding is likely. Confirm benefit and drainage function. Repeat xABCDE and choose the next destination from sustained physiology.

Avoid routine clamping of a drain in an actively leaking pneumothorax; trapped air can recreate tension. If a drain may have entered an organ or caused vascular injury, do not remove it reflexively without senior assessment and a controlled management plan. The appropriate response depends on instability and the suspected injury.

Clinical pearl
The postprocedure reassessment is part of the intervention, not optional follow-up.

Extended case: unilateral silence after intubation

3.14 Distinguish tube position, tension and hemorrhage

A 36-year-old man arrives after a collision with chest bruising and possible pelvic injury. He is intubated for deteriorating consciousness. Sustained exhaled CO2 is documented. Minutes later saturation falls, pressure declines and airway pressure rises. Air entry is markedly reduced on the left. The tube was secured before a difficult transfer between trolleys, but depth has not been rechecked. One resident declares a mainstem tube and proposes waiting for a radiograph. Another proposes repeated pleural procedures without examining the current tube or circuit. A third attributes hypotension solely to induction. Bedside ultrasound is being brought, but the patient is rapidly worsening.

The trauma leader must assign a coordinated response without turning a short differential into a sequential delay. Both an airway-position problem and a time-critical pleural process are plausible, and continued bleeding remains possible. The initial capnographic confirmation does not establish current bilateral ventilation.

Model judgment

Parallel reassessment: Assign immediate checks of tube depth, patency and equipment while another skilled clinician examines both hemithoraces and perfusion. Restore appropriate ventilation and oxygenation as the cause is evaluated.

Do not await delayed confirmation of a lethal threat: If the clinical pattern supports tension physiology in this unstable patient, proceed through the emergency decompression pathway. Rapid ultrasound can assist if immediately available without delaying necessary action. A radiograph is not a prerequisite for treating convincing unstable tension.

Interpret response: Improvement after correcting tube position supports that contribution; failure or incomplete improvement requires continued pleural and circulatory evaluation. A chest procedure must itself be checked for effectiveness. Do not repeat an unchanged failing intervention indefinitely.

Preserve the broader survey: Reassess bleeding, pelvic injury, ventilation effects and induction-related compromise. Mobilize appropriate support and choose definitive care from sustained response, not one transient pressure reading.

Clinical pearl
A short differential is useful only when the team can investigate and treat its urgent branches in parallel.

Extended case: low drain output during recurrent shock

3.15 A quiet collection chamber can be falsely reassuring

A 63-year-old woman with penetrating chest trauma receives tube drainage and blood-based support. An initial substantial blood return is recorded and pressure improves briefly. Over the next hour she becomes cooler and less interactive, needs more blood and develops increasing respiratory difficulty. Drain output falls to a small amount. The latest radiograph suggests persistent pleural opacity; tubing contains visible clot and the system has not been reassessed. A resident proposes continuing observation because the hourly output is below an operative threshold. Another recommends a CT detour to quantify the collection despite the recurring instability. Thoracic surgical expertise can be mobilized immediately.

The trajectory could reflect continued thoracic hemorrhage with ineffective drainage, a retained collection or another bleeding source. The surgeon must determine how much confidence the low output deserves, whether transport is safe and what action can establish durable control. The case does not supply a single numerical rule that can replace the bedside synthesis.

Model judgment

Recognize failed durable recovery: Increasing transfusion need and worsening perfusion are not neutralized by a low recorded drainage rate. Reassess drain patency, position, residual collection and other potential sources immediately.

Mobilize control: Coordinate senior trauma/thoracic and anesthesia teams with blood-bank support. Instability and ongoing loss can justify intervention before a numerical output threshold; a quiet blocked drain is not evidence of hemostasis.

Choose a safe diagnostic route: Use bedside information that changes immediate management. A routine CT journey can be unsafe in recurring shock; determine whether direct operative control or another urgent intervention is indicated from current physiology and capability.

Treat both burdens: Continue appropriate circulation support and correction of temperature/calcium/coagulation problems while addressing pleural ventilation and hemorrhage. Reassess after the intervention, including residual blood, continuing loss and respiratory function. Do not assume the initial response established lasting control.

Clinical pearl
Thresholds should accelerate concern, not create a waiting period for a patient whose physiology already demands action.

Section 3: final review and sources

3.16 Findings that must change the next decision

Finding	Required judgment
Shock with unilateral respiratory change	Reassess airway, pleural obstruction and blood loss promptly; treat a convincing lethal cause without harmful delay.
Open chest wound	Control communication with air-escape awareness and arrange definitive pleural/wound care.
Large or persistent air leak	Verify equipment/drain function and evaluate major airway/lung injury.
Ongoing blood need despite low output	Assess blocked drainage, retained collection and persistent bleeding; do not wait for a threshold.
Painful chest-wall injury with fatigue	Provide effective analgesia and reassess respiratory function; select support from physiology.
Apparently normal early imaging	Continue surveillance for evolving contusion and injuries not excluded by that test.
New deterioration after intervention	Repeat primary assessment and verify the treatment and devices, not merely the diagnostic label.

Sources and scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery. 22nd ed. Chapter 36, printed pp. 318-321 (supplied PDF pp. 665-668): primary-survey breathing assessment, pleural threats and linkage to circulation. Tables, decision sequence and cases are original educational applications.

[2] NICE. Major trauma: assessment and initial management. NG39. Chest assessment, urgent intervention and decision-directed imaging principles. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Applied selectively to avoid diagnostic delay in a clinically unstable patient.

[3] Coccolini F, Cremonini C, Moore EE, et al. Thoracic trauma WSES-AAST guidelines. World J Emerg Surg. 2025;20:78. doi:10.1186/s13017-025-00651-1. Used selectively for hemothorax drainage/control and the principle that physiology and clinical monitoring matter beyond output thresholds.

Contemporary sources checked 2 November 2026. Adult teaching framework; exact decompression/drain technique, device choice, ventilator prescriptions and operative thresholds require trained judgment and the local pathway. Definitive thoracic injury management is developed later in the chapter.

Next section: Circulation, identification of hemorrhage and initial resuscitation.

4. Circulation, hemorrhage recognition and initial resuscitation

4.1 Diagnose inadequate perfusion before collapse

The circulation assessment must answer three linked questions: Is tissue perfusion threatened? Where is blood being lost? What intervention can stop that loss now? Resuscitation and source control proceed together; an improved monitor reading does not establish that the injury has been controlled. The framework in this section is an original teaching synthesis of Sabiston, with selected guideline checks. [1-3]

Domain	Interpretation at the bedside
Mental state	Restlessness, confusion or reduced responsiveness may reflect poor perfusion, but also brain injury, hypoxemia, drugs or pain.
Skin and pulse	Cool extremities, weak peripheral pulses and delayed refill support concern; warm skin or a palpable pulse does not exclude shock.
Pressure and heart rate	Read trends and prior baseline. Older adults, beta blockade and pacing can blunt tachycardia; a seemingly normal pressure may represent substantial relative hypotension.
Metabolic evidence	Lactate and base deficit add information about oxygen debt and response. Neither identifies the bleeding compartment or substitutes for examination.
Support requirement	Increasing transfusion, recurrent hypotension or dependence on escalating support argues against durable recovery.

4.2 Avoid numerical exclusion rules

Early hemoglobin can remain near baseline despite important acute loss. Saturation measures oxygen saturation rather than circulating volume or total oxygen delivery. A single shock index, pressure or lactate cannot safely exclude hemorrhage. Use the mechanism, examination, serial physiology and treatment response to build a working diagnosis. [1]

Clinical pearl
Normal pressure is compatible with compensated hemorrhage. The decision to act should precede loss of compensation.

Find the source while controlling what is accessible

4.3 Search the major bleeding compartments

Location	Clues / bedside action	Limitation
External wounds	Expose selectively; apply effective direct pressure, packing or indicated tourniquet through the trained pathway.	A dressing may conceal continued loss. Confirm control and document tourniquet time.
Chest	Assess both sides; use focused ultrasound or radiograph when helpful; drain significant hemothorax and mobilize control.	Drain output can underestimate retained or clotted blood.
Abdomen	Examination and FAST inform urgent decisions; persistent instability with convincing intraperitoneal bleeding favors operative control.	Negative FAST does not exclude early, small-volume or technically missed bleeding.
Pelvis / retroperitoneum	Suspect from mechanism and findings; stabilize an appropriate suspected bleeding pelvic injury and activate the local pelvic pathway.	FAST does not exclude retroperitoneal hemorrhage.
Long bones / soft tissues	Inspect, align and splint as appropriate; consider large concealed losses and associated vascular injury.	An obvious fracture must not end the search for another source.

More than one compartment may be bleeding. Reinspect controlled wounds, drains and transfer surfaces during resuscitation. Obtain essential imaging at the bedside when it changes the next action; do not wait to finish a compartment checklist before treating an already identified life-threatening source. [1]

Clinical pearl
The visible wound is one possible source, not proof that all blood loss has been explained.

Pelvic bleeding and immediate mechanical control

4.4 Stabilize, then choose the fastest effective control route

In a compatible high-energy blunt injury with suspected pelvic bleeding, apply a purpose-made binder correctly over the greater trochanters through the trained local pathway. Do not repeatedly spring or manipulate the pelvis to reproduce instability. A binder is temporary stabilization; persistent shock requires further source assessment and definitive hemorrhage control. [1,3]

Pelvic hemorrhage may include venous, bony and arterial components. Packing, pelvic stabilization and embolization have complementary roles. Choose their sequence according to physiology, associated abdominal injury, immediate expertise and time to treatment. An angiography service that cannot become available promptly is not an effective immediate solution for a rapidly deteriorating patient.

Situation	Decision emphasis
Shock persists; abdominal source likely	Do not delay an indicated laparotomy for a routine pelvic imaging pathway. Coordinate pelvic control as needed.
Pelvic bleeding suspected; no immediate abdominal operation required	Select packing/stabilization and/or embolization through the institutional pathway, considering availability and ongoing support.
Binder appears ineffective	Check position and application; reassess other sources rather than simply tightening repeatedly.
Before removal or transfer	Communicate binder placement/time, suspected injury, physiology and control plan; avoid uncontrolled removal during active instability.

Splint major limb injuries and address external bleeding in parallel. Absent or worsening distal perfusion adds an urgent vascular problem; reduction, vascular assessment and definitive treatment need appropriate expertise. A normal distal pulse does not exclude every vascular injury.

Clinical pearl
A binder buys an opportunity for control. It does not certify that pelvic hemorrhage has stopped.

Start blood-based resuscitation without delaying control

4.5 Activate resources from physiology and trajectory

Activate the major hemorrhage pathway early when mechanism, shock, continuing loss or response to initial treatment predicts substantial ongoing transfusion. Do not wait for a retrospective definition of massive transfusion or a single score to be satisfied. Alert the surgeon, anesthesia team, blood bank and relevant procedural teams with a clear location and immediate objective. [1,2]

Obtain short, large-bore peripheral access when feasible. If access fails, use an appropriate intraosseous bridge while further access is established. A central line is not a prerequisite for beginning emergency blood support. Send blood group/crossmatch, blood count, coagulation tests including fibrinogen, blood gas, lactate and ionized calcium as available, without delaying time-critical treatment.

Priority	Practical judgment
Blood availability	Use emergency-release products through the blood-bank protocol when waiting for crossmatched blood is unsafe.
Hemostatic support	Use an approved whole-blood pathway or balanced components; do not treat major ongoing hemorrhage with red cells alone.
Component meaning	For a 1:1:1 plasma:platelet:RBC strategy, count platelet equivalents correctly. One adult apheresis dose is not the same as one single-donor platelet unit.
Crystalloid	Avoid large-volume crystalloid substitution for blood in active hemorrhage; if blood is temporarily unavailable, a limited bridge must not delay control or transfer.
Temperature	Warm the patient and delivered products; monitor temperature and use appropriate rapid-infusion equipment.

Clinical pearl
Resuscitation sustains the patient while bleeding is stopped. Escalating infusion cannot make an uncontrolled injury safe.

Pressure goals, coagulopathy and treatment limits

4.6 Individualize the bridge to source control

Before hemorrhage control, selected adults may benefit from restrictive volume resuscitation rather than attempts to normalize every pressure reading. This is a short bridge with repeated assessment, not acceptance of prolonged hypoperfusion. Suspected traumatic brain injury changes the balance: avoid secondary cerebral injury and use a less restrictive approach when needed to preserve cerebral perfusion. Consider spinal injury, age and baseline cardiovascular disease rather than applying one pressure target to everyone. [1,2]

Vasopressors may occasionally be a temporary adjunct for peri-intubation hypotension or a concurrent vasodilatory mechanism under experienced supervision. They do not replace blood, relieve obstructive shock or control hemorrhage. A pressure restored by a pressor alone does not establish adequate flow. [1]

Problem	Response during ongoing control
Hypothermia / acidosis	Prevent cooling, restore perfusion and control loss. Correcting a laboratory number alone will not reverse continued hemorrhage.
Citrate-associated hypocalcemia	Monitor ionized calcium during substantial transfusion; replace using the local protocol and reassess.
Coagulation deficits	Start the hemorrhage protocol, then adapt to timely conventional or viscoelastic results and the clinical picture.
Fibrinogen / platelets	Identify and replace relevant deficits through the protocol; do not assume plasma alone corrects every defect.
Anticoagulants	Identify agent, dose and last administration; use agent-specific reversal for major bleeding with expert support. Normal routine tests may not exclude a clinically relevant DOAC effect.

Give tranexamic acid promptly when significant traumatic bleeding is present or suspected and the patient is within the indicated early window. Routine initiation beyond three hours after injury is not recommended without evidence of hyperfibrinolysis under an appropriate pathway. TXA does not replace definitive control. [2]

Use response to choose the next destination

4.7 A response is a trajectory, not a one-time label

Pattern	Meaning	Next decision
Sustained improvement	Perfusion improves and remains acceptable without escalating support.	Consider definitive imaging if the journey and study are tolerable; continue reassessment.
Transient response	Initial improvement followed by recurrent shock or continuing high support.	Assume unresolved bleeding or another untreated cause until reassessed; accelerate control.
Minimal / no response	Persistent inadequate perfusion despite initial treatment.	Check delivery and intervention effectiveness; urgently address uncontrolled hemorrhage, obstruction or mixed shock.

A negative FAST does not make a nonresponder safe for routine CT. Repeat a focused examination or ultrasound when useful, check chest and pelvis, and choose operative or interventional control from the most plausible treatable source and available capability. In a sustained responder, CT can define injuries and guide nonoperative or endovascular care. Tolerance depends on the whole journey, access to rescue and the support needed to remain stable. [1,2]

4.8 Reopen the differential without abandoning hemorrhage control

Tension pneumothorax, tamponade, cardiac dysfunction, spinal cord-associated vasodilation and drug or ventilation effects may coexist with blood loss. Use mechanism, examination, bedside cardiac/chest assessment and procedural timing. Bradycardia with weakness can suggest neurogenic shock, but does not rule out simultaneous hemorrhage. A pressor response cannot distinguish these diagnoses reliably.

Repeat perfusion examination, pressure/pulse, mental state, temperature and treatment requirements after major actions. Follow gases and lactate trends when useful, recognizing delayed clearance and confounding. Urine output provides additional information after safe catheter placement when appropriate; do not delay control to obtain it or force catheterization when urethral injury is suspected.

Clinical pearl
If apparent stability requires progressively more support, change the control plan rather than congratulating the resuscitation.

Extended case: negative FAST with recurrent shock

4.9 Choose a control route under competing explanations

A 46-year-old motorcyclist arrives 45 minutes after a collision. Prehospital pressure was 76/48 mm Hg. A pelvic binder was applied over the iliac crests, and a thigh wound was dressed. He now has pressure 102/62, pulse 118/min, cool hands and increasing anxiety. Oxygen saturation is 98% on supplemental oxygen. The first hemoglobin is 13.1 g/dL and FAST is negative, although the pelvic view is limited. A resident argues that the normal hemoglobin and empty abdomen favor a stable isolated femoral fracture. Emergency blood briefly improves pressure, but it falls to 82/50 as the second unit runs. The dressing is becoming saturated. CT is ready on another floor. The operating team can assemble immediately, whereas the embolization team estimates a 40-minute arrival.

The chest examination is unchanged without evidence of a major pleural collection. A portable pelvic image shows a displaced pelvic ring injury. The patient is becoming less interactive. Anesthesiology requests a clear destination before induction, and the blood bank asks whether to continue the hemorrhage pathway. A second clinician proposes norepinephrine so that transport to CT can proceed.

Model judgment

Recognize unresolved shock: This is a transient responder with ongoing support needs. Neither the first hemoglobin nor the negative, partly limited FAST excludes major hemorrhage. Do not use a pressor to manufacture transport eligibility.

Treat accessible losses now: Confirm effective wound control; reassess distal perfusion and splint the limb. Correct binder placement over the greater trochanters with trained assistance. Continue blood-based resuscitation, warming and early-window TXA when indicated, while repeating the focused source assessment.

Resolve the destination: Mobilize immediate surgical pelvic-control capability through the local pathway. Consider packing/stabilization rather than waiting passively for delayed embolization; retain embolization as a complementary option. Reassess the abdominal indication and coordinate laparotomy if warranted. Routine remote CT is unsafe in this deteriorating trajectory.

Clinical pearl
The key judgment is not which single injury explains everything; it is which available action can stop lethal loss soon enough.

Extended case: a normal pulse and mixed shock

4.10 Separate improvement in pressure from restoration of flow

A 78-year-old woman taking a beta blocker and apixaban is brought after a high-speed collision. She has chest bruising, lower abdominal tenderness and reduced movement in both legs. Pressure is 108/64 mm Hg, pulse 72/min and temperature 35.2 C. Her family reports usual systolic readings near 165. She is confused, with cool mottled feet and a lactate of 5.4 mmol/L. Hemoglobin is 11.8 g/dL. FAST shows a small amount of fluid near the liver, but the operator is uncertain. The resident attributes the modest pulse and leg weakness to neurogenic shock and requests a vasopressor before any blood is released. Another clinician wants complete spine CT before deciding whether the abdominal finding matters.

During preparation, the pressure falls to 84/50. The airway team anticipates intubation because consciousness is worsening. Bedside reassessment finds bilateral air entry without a large pleural collection; the cardiac view is technically limited. A small blood bolus improves pressure briefly. Apixaban timing and renal function are unknown. The local hospital has an operating team and emergency blood, but no overnight spinal surgery service; transfer coordination has not started.

Model judgment

Read the context: Beta blockade, relative hypotension, abnormal perfusion and recurrent deterioration outweigh the reassuring pulse. Neurogenic and hemorrhagic mechanisms can coexist. Reevaluate the pericardium/chest when indicated without delaying treatment of likely bleeding.

Act on the dangerous working diagnosis: Activate the hemorrhage pathway, repeat focused abdominal assessment as useful and urgently obtain surgical source-control judgment. Do not send an unstable patient to complete spine imaging before addressing likely ongoing loss. Identify anticoagulant exposure and arrange appropriate reversal for major bleeding; do not wait for routine tests to exclude apixaban effect.

Coordinate the next minutes: Prepare airway intervention with blood, monitoring and a rescue plan because induction may precipitate collapse. Maintain spinal precautions and appropriate perfusion. Begin specialist transfer coordination while treating immediately controllable threats locally; provide the receiving team with unresolved injuries, support requirements and trajectory.

Clinical pearl
A plausible alternative diagnosis is not permission to leave hemorrhage untreated. Mixed shock requires parallel reasoning and explicit priorities.

Section 4: final decisions and review sources

4.11 The circulation assessment must produce an action

Question	Expected output
Is perfusion adequate?	Integrated assessment of examination, trends, baseline and support requirements.
Where might blood be lost?	External, chest, abdominal, pelvic/retroperitoneal and long-bone/soft-tissue search.
What can be controlled now?	Effective external measures, appropriate stabilization and immediate source-control activation.
What supports the bridge?	Reliable access, timely blood-based resuscitation, warming and monitoring; targeted adjuncts.
Has treatment worked?	Sustained improvement rather than temporary pressure normalization.
Where should the patient go?	Operating room, interventional control, decision-directed CT or supported transfer according to trajectory and capability.
What remains unexplained?	A plan for persistent loss, failed treatment or a second shock mechanism.

Errors that reveal weak judgment

Excluding blood loss with early hemoglobin; calling a negative FAST a complete bleeding screen; accepting a misplaced binder; delaying activation until a score is positive; giving repeated crystalloid to normalize pressure; interpreting pressor dependence as stability; sending a transient responder to remote CT without a realistic rescue plan; and labeling hypotension neurogenic before evaluating hemorrhage.

Sources and scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36. Core circulation discussion: printed pp. 321-323 (source PDF pp. 668-670). Tables and cases here are original educational synthesis.

[2] NICE. Major trauma: assessment and initial management. NG39, recommendations 1.5.1-1.5.30. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Used for early hemorrhage control, activation by physiology, access, restrictive resuscitation with brain-injury considerations, blood support, TXA and decision-directed imaging.

[3] NICE. Fractures (complex): assessment and management. NG37, pelvic hemorrhage and binder recommendations. https://www.nice.org.uk/guidance/ng37/chapter/recommendations. Sources checked 2 November 2026.

Educational adult-trauma framework: pediatric, pregnancy and injury-specific targets require the relevant pathway. Product preparation, drug doses, reversal selection and invasive procedures follow trained institutional protocols. Next: disability, exposure, prevention of secondary injury and reassessment.

5. Disability, exposure and prevention of hypothermia

5.1 A rapid neurological assessment must change care

Disability is a brief assessment of brain and spinal function within the primary survey. It identifies threatened neurological function and establishes a baseline for comparison. Exposure identifies otherwise hidden injuries while environmental control limits further heat loss. Neither task suspends treatment of airway compromise, hypoxemia or hemorrhage. [1]

Assessment	Record	Decision
Consciousness	Eye, verbal and motor responses, with time and confounders.	Identify deterioration; support airway and perfusion while seeking the cause.
Pupils	Size, symmetry and light response on each side; ocular injury or prior abnormality.	New asymmetry or loss of reactivity requires urgent reassessment.
Motor function	Movement of each limb, asymmetry and gross sensory findings when feasible.	Suspect brain, spinal, peripheral nerve or limb injury according to the pattern.
Glucose	Prompt bedside measurement in altered consciousness.	Treat a reversible abnormality without abandoning evaluation of traumatic injury.
Temperature / exposure	Reliable temperature trend, wet clothing, concealed wounds and examination limitations.	Begin heat conservation and warming while completing a safe examination.

Whenever feasible, document the neurological findings before sedatives, analgesics or neuromuscular blockade. Never delay a lifesaving airway intervention solely to complete a score. If treatment has already obscured the examination, record the last reliable findings, their source, medication timing and what cannot now be tested.

Clinical pearl
A neurological score is a baseline and a trend. It is not an explanation for why the patient is deteriorating.

Glasgow Coma Scale: measure and interpret

5.2 Report the components rather than only the total

Component	Responses and score
Eye opening	4 spontaneous; 3 to sound; 2 to pressure; 1 none.
Verbal response	5 oriented; 4 confused; 3 words; 2 sounds; 1 none.
Motor response	6 obeys commands; 5 localizes; 4 normal flexion/withdrawal; 3 abnormal flexion; 2 extension; 1 none.

Use a standardized assessment and appropriate stimulus through the trained pathway. Record E, V and M separately, then a total only when all components are testable. Intubation, marked facial swelling, aphasia, language barriers, deafness, sedatives and paralysis can limit interpretation. An untestable verbal response is not a measured verbal score of 1. Do not manufacture a comparable total from untestable components.

5.3 Preserve clinically important detail

The best motor response determines the motor component, but it must not conceal a weaker limb on the other side. Document lateralizing findings separately. A patient who obeys with the right hand but does not move the left arm has a focal abnormality even if the best motor score is 6.

A reliable post-resuscitation GCS of 8 or less signals severe impairment and demands urgent airway and brain-injury management. Airway adequacy, protective function, gas exchange, agitation, associated injuries and the anticipated trajectory also matter; clinically important airway risk can exist with a higher score. [1,2]

Serial comparison is meaningful only when conditions are stated. A fall in the motor response before medication is different from absent movement during neuromuscular blockade. Record who examined the patient, when, after which intervention, and whether a change reflects a new finding or a change in testability.

Clinical pearl
E3 V4 M6 with a new unilateral deficit conveys more useful information than an isolated statement of GCS 13.

Neurological deterioration: protect first, then define the lesion

5.4 Revisit xABC before anchoring on the head

A decline in responsiveness may arise from expanding intracranial injury, but also from hypoxemia, inadequate ventilation, hypoperfusion, seizure, glucose disturbance or medication effects. Repeat immediate physiological assessment while obtaining an urgent focused neurological reassessment. Do not attribute confusion to intoxication simply because alcohol or drug use is reported.

New finding	Immediate reasoning
Falling consciousness	Check airway, oxygenation, ventilation, circulation, glucose and recent drugs while escalating head-injury assessment.
New pupil asymmetry / motor deficit	Consider intracranial deterioration urgently; document ocular injury and baseline without using them to dismiss a new change.
Seizure or persistent unexplained unresponsiveness	Protect airway and physiology, treat active seizures through protocol and seek appropriate neurological assessment.
No movement after induction	Check blockade and sedation timing; use the premedication examination and pupils rather than inventing a neurological prognosis.

5.5 Prevent secondary injury during every transition

Avoid hypoxemia and hypotension, maintain appropriate ventilation and reassess after intubation or transport. Routine prophylactic hyperventilation can reduce cerebral blood flow and should not be used simply because head injury is suspected. In a clinical herniation emergency, protocol-directed temporizing treatment, including carefully controlled ventilation when indicated, accompanies urgent specialist and definitive care; it does not replace it. [2]

Arrange head CT and neurosurgical involvement according to findings and physiological tolerance. A deteriorating patient with suspected intracranial injury needs urgent coordinated action, but an uncontrolled extracranial threat may require treatment before an unsafe trip to the scanner. Assign responsibility for balancing the competing threats and communicating with receiving specialists.

Clinical pearl
Protect the injured brain by correcting systemic threats as well as identifying the intracranial lesion.

Spinal function and the danger of diagnostic anchoring

5.6 Find deficits without creating additional risk

Assess spontaneous movement or command-following in all limbs, then gross sensation when feasible. Document asymmetry, a possible sensory level and limitations caused by pain, fractures, sedation or impaired communication. Preserve appropriate spinal motion restriction during examination and necessary transfers; a brief apparently normal motor screen does not clear the cervical spine. [1]

Weakness can arise from central injury, peripheral nerve damage, limb ischemia, pain or medication. Identify the pattern rather than equating every immobile limb with cord injury. Do not force movement through an unstable or painful injury to complete a checklist. Obtain further spinal imaging and specialist assessment through the appropriate pathway once immediate threats are managed.

Term / situation	Judgment
Neurogenic shock	A hemodynamic syndrome from loss of sympathetic tone after a compatible spinal injury. Hypotension with relative bradycardia may support it, but hemorrhage still needs evaluation.
Spinal shock	Transient depression of neurological reflex activity below an acute cord injury; this is not a synonym for circulatory shock.
Mixed injury	Spinal injury and active bleeding can coexist. Treat perfusion and bleeding in parallel rather than selecting one label prematurely.
New deficit during care	Reassess physiology, positioning and the neurological examination; escalate urgently and review preceding transfers or interventions.

Communicate the last reliable limb examination before induction. After drugs or procedures, report what is untestable and when a meaningful repeat examination may be possible. Do not make an early irreversible prognostic conclusion from an examination confounded by shock, hypothermia or medication.

Clinical pearl
Recognizing a cord injury should increase attention to perfusion and safe handling, not end the search for hemorrhage.

Exposure: complete the examination without losing control

5.7 Look beyond the visible injury

Remove clothing as necessary to identify hidden bleeding, wounds, deformity, burns and devices. Inspect the back and other concealed surfaces when clinically appropriate with coordinated assistance. Preserve dignity, communicate what is being done, secure belongings and promptly cover areas no longer under examination. [1]

Task	Safety question
Examine concealed surfaces	Could an unseen wound or expanding hematoma change immediate treatment?
Coordinate movement	Can the team protect the airway, spine, pelvis, lines and drains during this maneuver?
Choose timing	Would turning now interrupt lifesaving treatment or destabilize an inadequately supported patient?
Maintain coverage	Can examination proceed in stages with immediate re-covering?
Document limitations	Which surface or region remains unexamined, why, and who will complete it?

Exposure means achieving an adequate examination, not leaving the patient uncovered until all investigations are complete. Plan any turn around the injury pattern and team capability. Avoid an automatic log roll of an unstable patient merely to mark exposure complete; use an appropriate coordinated technique and defer nonessential movement until it is safer.

5.8 An incomplete examination needs explicit ownership

If posterior examination is temporarily unsafe, state the limitation at handover and assign its completion. Reassess dressings, splints and pressure areas when appropriate. A documented primary survey can still contain an unexamined region; treating documentation as proof of completeness invites missed injury.

Clinical pearl
Expose with a purpose, move with a plan, and re-cover immediately. An unsafe maneuver is not justified by a checklist heading.

Hypothermia: prevention begins before the temperature falls

5.9 Stop ongoing loss and support rewarming

Injured patients lose heat through environmental exposure, wet clothing, uncovered skin and treatment-related factors. Shock limits heat production and distribution, while anesthesia can worsen heat loss. Cooling aggravates coagulation dysfunction and complicates resuscitation. Preventing further cooling belongs in the initial treatment, not after imaging or surgery. [1,3]

Measure	Application
Environment and insulation	Reduce drafts and unnecessary exposure; use a suitably warm treatment space and insulating coverage.
Wet clothing	Remove wet garments when feasible, dry the patient and replace with dry insulation.
Active warming	Use approved warming equipment correctly with skin protection and monitoring. Avoid unregulated direct heat.
Blood and fluid delivery	Use appropriate warming devices during resuscitation; coordinate with rapid-infusion equipment and blood-bank practice.
Temperature monitoring	Measure with an appropriate method, repeat and record the trend. A peripheral reading may poorly represent core temperature in shock.
Transitions	Maintain coverage and warming during CT, operating-room transfer and interhospital transport; name who will continue monitoring.

A blanket limits loss but may be insufficient in a cold, shocked patient receiving major transfusion. Combine heat conservation, active warming and correction of the cause of shock. Do not postpone hemorrhage control to normalize temperature; warming continues alongside definitive treatment.

Severe hypothermia with dysrhythmia, arrest or a major environmental exposure requires a dedicated hypothermia pathway and specialist input. Accidental cooling in hemorrhagic trauma is not a reason to initiate therapeutic hypothermia for presumed neuroprotection.

Clinical pearl
Temperature is a resuscitation variable. Recheck it after transfer rather than assuming the warming order was delivered.

Extended case: a neurological emergency during hemorrhage care

5.10 Competing threats require one coordinated plan

A 39-year-old man arrives after a collision. At handover he opens his eyes to sound, speaks confused sentences and obeys commands with all limbs. Pupils are equal and reactive. He has an unstable pelvic injury and cool extremities. Blood support and a correctly positioned binder improve pressure from 78/46 to 106/64 mm Hg. Fifteen minutes later, while the team prepares transfer for definitive bleeding control, he stops following commands with the left hand. The right pupil is now larger and sluggish. Saturation reads 95%, the pressure has fallen to 86/52 and blood is still being infused. No sedative or paralytic has yet been administered. Glucose is normal. The CT scanner requires a journey away from the resuscitation room; neurosurgery is at the regional center, whereas a local operating team is ready.

A resident suggests that hypotension explains everything and wants to continue the original plan without notifying neurosurgery. Another asks for immediate CT before any further resuscitation. The airway clinician anticipates loss of airway protection during transport. The patient is uncovered, with a temperature of 35.0 C, and the warming device has not been connected.

Model judgment

Identify a true new deficit: The documented predrug examination makes the lateralizing change interpretable. Do not dismiss it as a nonspecific effect of shock. Escalate suspected intracranial deterioration while immediately reassessing airway, ventilation and perfusion.

Coordinate rather than sequence blindly: Continue blood support and urgent hemorrhage-control planning; involve neurosurgery and anesthesia immediately. Decide whether urgent local control, a supportable scan or direct specialist transfer offers the safest achievable route. Neither a routine CT detour during collapse nor ignoring the neurological change is defensible.

Protect during intervention: If airway control is required, prepare for peri-induction deterioration, preserve spinal precautions and document pupils and component responses before drugs when feasible. Avoid routine uncontrolled hyperventilation. Begin active warming and maintain it throughout the chosen route.

Clinical pearl
Good judgment makes the competing risks explicit and assigns a time-sensitive plan for both brain perfusion and hemorrhage control.

Extended case: the examination disappears after induction

5.11 Interpret what can and cannot be measured

A 67-year-old woman is found after a fall outdoors in rain. She is confused and hypothermic, with pressure 92/56 mm Hg and pulse 64/min while taking a beta blocker. Before induction she opens her eyes to sound, makes confused statements, squeezes with both hands but cannot lift either leg. The examination is limited by pain and a deformed thigh. These findings are relayed verbally but not charted. She is intubated for worsening respiratory function and receives an opioid, induction agent and neuromuscular blocker. At the receiving hospital no limb movement is seen. A junior clinician records GCS 3 and suggests a devastating irreversible spinal injury. Temperature is 33.8 C. Wet clothing remains under the transport sheet, and the posterior trunk has not been examined.

The transport pressure was maintained with increasing support. FAST is negative, the abdomen is difficult to examine and the thigh is swollen. The team proposes a complete log roll before addressing the falling pressure, followed by prolonged imaging to establish a neurological prognosis. A nurse asks whether the absent motor response should be communicated as a new change.

Model judgment

Recover the reliable baseline: Obtain and document the preinduction E, V and limb findings with source and time. The current pharmacologically obscured examination cannot establish GCS 3 as a comparable measured total or prove new paralysis. Record components as untestable when appropriate.

Reopen circulatory assessment: Increasing support, relative bradycardia and a negative FAST do not exclude hemorrhage. Evaluate the thigh and other compartments, continue appropriate resuscitation and maintain spinal precautions. Suspected neurogenic shock may coexist, but does not settle the diagnosis.

Correct avoidable exposure: Remove wet garments safely, dry, insulate, actively warm and monitor temperature. Defer a destabilizing turn until essential support and personnel are ready; explicitly assign the unfinished posterior examination. Arrange spinal and neurological evaluation without premature prognostic conclusions.

Clinical pearl
An absent response during paralysis is an assessment limitation. The clinical task is to preserve physiology and recover an interpretable examination.

Section 5: final review and sources

5.12 What must survive the handover?

Required information	Why it matters
Last reliable E, V and M, with time	Provides a comparable neurological baseline.
Pupil findings and limb asymmetry	Preserves focal abnormalities hidden by a total score.
Drugs and examination limitations	Distinguishes deterioration from loss of testability.
Oxygenation, ventilation and perfusion trend	Identifies preventable secondary injury and transport risk.
Spinal concern and handling plan	Protects against unsafe movement and missed evolving deficits.
Temperature and warming actually delivered	Prevents cooling from being lost between teams.
Unexamined regions and named follow-up	Keeps incomplete exposure visible and actionable.

Errors that reveal weak judgment

Calling every low score primary brain injury; assigning a measured total despite untestable components; missing asymmetry because the best motor score is normal; dismissing new pupil changes as intoxication; using routine hyperventilation; equating spinal shock with neurogenic shock; accepting hemorrhage exclusion from a negative FAST; leaving the patient wet or uncovered; and performing unsafe movement solely to complete documentation.

Sources and educational scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36. Core Disability and Exposure passage: printed p. 323 (source PDF p. 670). This section expands that brief primary-survey framework through original tables and cases; it is not a verbatim textbook extract.

[2] American College of Surgeons. Best Practices Guidelines: The Management of Traumatic Brain Injury. 2024. https://www.facs.org/media/vgfgjpfk/best-practices-guidelines-traumatic-brain-injury.pdf. Selected cross-checks: neurological assessment, airway/ventilation, secondary injury prevention and rescue treatment for deterioration.

[3] NICE. Major trauma: assessment and initial management. NG39, recommendation 1.6.1, and supporting Warming chapter. https://www.nice.org.uk/guidance/ng39/chapter/recommendations; https://www.ncbi.nlm.nih.gov/books/NBK368081/. Sources checked 2 November 2026.

Adult educational framework. Detailed intracranial-pressure therapy, spinal-cord perfusion targets, rewarming in severe environmental hypothermia and pediatric assessment require their dedicated specialist pathways.

6. Adjuncts and imaging selected by physiological stability

6.1 Order a study to resolve a decision

Adjuncts refine the working diagnosis, monitor treatment and direct the next intervention. They do not replace the primary survey or justify delaying treatment of a clinically evident lethal threat. Before requesting a test, state what it could change: immediate control, the operative or endovascular route, safe observation, specialist involvement or transfer. [1]

Clinical trajectory	Useful approach	Danger to avoid
Persistent instability / poor response	Minimal rapid bedside studies that direct immediate intervention; continue resuscitation and mobilize control.	Completing an imaging package while shock progresses.
Transient response	Reassess ongoing loss, support and available rescue; decide whether a brief study is truly supportable.	Calling a single improved pressure stable.
Sustained response / stable physiology	Appropriate CT or targeted imaging to define injury and guide treatment.	Assuming that improvement eliminates the need for continued monitoring.

Stability is operational: can the patient tolerate the journey, positioning, scan and return while effective support continues? Consider airway protection, ventilation, blood requirements, mental state, temperature and access to rescue. A remote scanner and an integrated resuscitation scanner do not create identical risks.

6.2 Distinguish information from delay

The test with the most anatomical detail is not always the test with the greatest immediate value. Conversely, repeatedly performing low-yield bedside studies can delay appropriate CT in a patient who is ready for it. Define the unanswered question and choose the shortest safe route to a management decision.

Clinical pearl
Imaging eligibility depends on trajectory and rescue capability, not a single blood-pressure threshold.

Bedside adjuncts: rapid answers with defined limits

6.3 Match the modality to the clinical question

Adjunct	What it can contribute	What it cannot establish alone
eFAST	Pericardial or intraperitoneal fluid; pleural fluid and selected pneumothorax signs.	A complete inventory of injuries or reliable exclusion of retroperitoneal and hollow-viscus injury.
Portable chest radiograph	Pleural collections, gross thoracic abnormalities and selected device-position checks.	Exclusion of all aortic, diaphragmatic or occult pleural injury.
Pelvic radiograph	Rapid identification of important pelvic ring disruption when this directs urgent control.	Absence of bleeding from every pelvic or retroperitoneal source.
ECG / focused cardiac assessment	Rhythm, possible cardiac injury or a medical cause of collapse; focused hemodynamic clues.	Exclusion of cardiac injury from one normal test.
Laboratory tests	Blood preparation, oxygen debt, metabolic disturbances and hemostatic deficits.	An anatomical bleeding location or proof of adequate perfusion from one result.

Use these tools while other team members continue treatment. Identify who performs the study, who interprets it and who communicates a critical result. A technically inadequate study is an unresolved question, not a negative result. Document the limitation and select the next step from physiology and clinical suspicion. [1]

If a patient has a convincing tension pneumothorax with severe respiratory or hemodynamic compromise, treatment should not await a radiograph. Similarly, a bedside image that already establishes the need for immediate control should trigger action rather than an automatic sequence of additional tests.

Clinical pearl
A rapid adjunct is useful when its result reaches the person making the next decision in time to matter.

FAST: interpret the result in its clinical setting

6.4 A negative study does not close the hemorrhage search

FAST seeks fluid in selected spaces. Performance depends on timing, volume, body habitus, access and operator technique. Bleeding may be early, outside the examined compartments or obscured by technical limitations. A positive examination in the appropriate context raises concern for traumatic bleeding, but does not by itself identify the injured organ or every competing source. [1]

Finding and physiology	Judgment
Positive abdominal FAST with persistent shock	Urgently consider operative hemorrhage control in the compatible setting; do not require routine CT confirmation first.
Negative FAST with persistent shock	Reassess chest, pelvis/retroperitoneum, external wounds and long bones; repeat a focused study only when useful without delaying control.
Positive FAST with sustained response	Appropriate CT can define injuries and management options when the patient can tolerate it.
Limited / equivocal study	Report the uncertainty explicitly; choose repeat examination, CT or intervention from the whole clinical picture.

6.5 Avoid using FAST as a gatekeeper to CT

When immediate CT is already appropriate, requiring serial FAST examinations or routine preliminary films can add delay without changing management. A negative scan must not be used to cancel a clinically indicated CT. NICE specifically separates the unstable nonresponder pathway from the responding or stable patient pathway. [2]

A complete trauma assessment also looks for injuries that may produce little early free fluid: bowel, mesentery, pancreas, diaphragm and retroperitoneal structures. Persistent symptoms or deterioration after initially reassuring imaging require re-evaluation rather than reassurance by repetition of the original report.

Clinical pearl
FAST is a focused question about selected findings. It is not a declaration that the torso is uninjured.

CT: define the injury when the patient can tolerate the process

6.6 Select coverage and protocol deliberately

In adults with major blunt trauma and suspected injuries in several regions, a whole-body CT approach can efficiently characterize injury. Targeted imaging may be appropriate when suspicion is localized. The chosen protocol must answer the relevant brain, vascular, thoracic, abdominal and pelvic questions; a generic scan name is not a substitute for communication with radiology. [1,2]

Question	Protocol implication
Intracranial bleeding	Noncontrast head imaging is typically the initial CT examination for acute traumatic hemorrhage.
Torso organ / vascular injury	Appropriate intravenous contrast and acquisition timing are important; communicate suspected arterial, venous or urinary injury.
Blunt cerebrovascular or aortic concern	Use an indicated angiographic protocol rather than assuming routine nonangiographic images exclude vascular injury.
Possible bladder / urethral injury	Dedicated studies may be needed; routine abdominal CT does not answer every urinary-tract question.
Spinal / neurological discrepancy	CT characterizes many bony injuries; MRI may be needed for selected cord, ligamentous or unexplained neurological findings.

Do not routinely substitute adult whole-body protocols for pediatric selective imaging. In pregnancy, balance maternal injury risk with appropriate imaging expertise; necessary lifesaving diagnosis should not be abandoned solely because radiation is involved. These groups require tailored pathways rather than automatic extension of the adult framework.

Review contrast history and renal concerns when feasible, but weigh them against the immediate danger of missing a life-threatening injury. Choose the diagnostic protocol with the responsible team; a nondiagnostic compromise can expose the patient to both delay and repeat imaging.

Clinical pearl
Request the examination that answers the injury question, and tell radiology why the answer is urgent.

Monitoring, laboratory tests and transport readiness

6.7 Adjuncts should follow resuscitation, not distract from it

Send type and crossmatch, blood count, blood gas, lactate/base deficit, electrolytes, ionized calcium and coagulation studies as indicated by severity and treatment. Use fibrinogen and viscoelastic assessment where available to guide evolving hemostatic support. Repeat selected measurements to assess trajectory; avoid treating early hemoglobin or a single reassuring gas as evidence that bleeding has stopped. [1]

Continuous ECG, oxygen saturation and pressure monitoring support serial assessment; capnography is important in an intubated patient. Interpret measurements with waveform quality and clinical examination. Urine output may add perfusion information after safe catheter placement, but catheterization should not delay control or be forced when urethral injury is suspected.

Before departure for imaging	Required decision
Airway and ventilation	Can oxygenation, ventilation and device security be maintained in the scanner?
Circulation	Is improvement durable, and can needed blood/support continue with reliable access?
Personnel and equipment	Who accompanies the patient, monitors changes and has the skills and equipment to respond?
Rescue and destination	What stops the scan, where will the patient go if deterioration occurs, and are control teams ready?
Communication	Has radiology received the suspected injuries, protocol need and physiological risk?
Warmth and movement	Will warming, spinal precautions and protection of lines/drains continue?

Reassess immediately before departure. A decision made ten minutes earlier expires when physiology changes. If deterioration occurs during imaging, stop and treat the new threat rather than finishing the study merely because only one sequence remains.

Clinical pearl
Transport to CT is a clinical intervention with staffing, support and an exit plan.

Extended case: a normal pressure sustained by increasing support

6.8 Decide whether CT is an opportunity or a dangerous detour

A 52-year-old man arrives after a high-speed collision. His pressure was initially 74/42 mm Hg and has risen to 108/66 during emergency transfusion. He is intubated, with a secured tube and acceptable ventilation. The first FAST is negative; the pelvic view is poor. A chest film shows no large pleural collection. He has lower abdominal bruising and a displaced pelvic ring injury with a correctly positioned binder. The surgical resident requests immediate whole-body CT because the pressure is now normal. The blood bank reports that six red-cell units have been issued in the past 25 minutes. A nurse notes that the pressure falls whenever the infusion slows. Lactate has risen from 4.2 to 6.0 mmol/L and the hands remain cool. The scanner is on a different floor; the operating team is ready, but interventional radiology has not yet been contacted.

As transport arrives, the pressure is 96/58 on continuing rapid blood delivery. The radiographer asks whether the patient is stable enough for a 15-minute visit. A colleague proposes a vasopressor increase to maintain pressure during the journey. Another suggests repeating FAST until an abdominal source is demonstrated before any intervention is considered.

Model judgment

Reject snapshot stability: Continuing high support and deteriorating perfusion indicate unresolved shock. Neither normal pressure during rapid transfusion nor a limited negative FAST establishes transport readiness.

Choose decision-directed adjuncts: Reassess likely sources and treatment effectiveness at the bedside. A repeat focused examination can help if immediate and actionable, but serial scanning must not become a requirement for hemorrhage control. Pelvic/retroperitoneal bleeding remains plausible despite negative abdominal views.

Mobilize control: Coordinate the fastest appropriate operative and/or endovascular pathway with anesthesia and the trauma leader. Do not use a pressor to conceal inadequate control for remote CT. Continue blood support, warming and reassessment, and reconsider imaging if sustained improvement and a realistic rescue route make it useful and tolerable.

Clinical pearl
Dependence on accelerating resuscitation is evidence against stability, even when the latest pressure looks satisfactory.

Extended case: stable enough to scan, unsafe to stop thinking

6.9 Act on the unresolved question after reassuring imaging

A 31-year-old woman is evaluated after a restrained collision. She remains alert with pressure 118/72 mm Hg and pulse 94/min without escalating support. She has a prominent abdominal belt mark and focal lower abdominal tenderness but no generalized rigidity. FAST is negative. A resident proposes observation without CT because the ultrasound shows no fluid. The trauma leader requests contrast-enhanced abdominal/pelvic CT to evaluate the mechanism and examination. Imaging shows a small mesenteric hematoma and a limited amount of unexplained free fluid without a definite solid-organ source, active arterial bleeding or clear perforation. The preliminary report is summarized during handover as no major injury. Analgesia reduces her pain initially, and the team considers discharge because vital signs remain normal.

Four hours later she develops increasing tenderness and persistent tachycardia. Blood pressure is still 114/70 and hemoglobin has changed little. A nurse reports that the abdomen is more distended. Another clinician argues that the negative FAST, stable hemoglobin and lack of free air on the earlier CT make operative injury unlikely. The surgeon must decide between continued observation, repeat targeted imaging and exploration.

Model judgment

Identify the initial indication: Stable physiology permitted CT; negative FAST did not cancel the need to evaluate suspected bowel/mesenteric injury. The first CT contained unresolved findings and should not have been translated into an unqualified negative handover.

Use the evolving examination: Worsening pain, tenderness and tachycardia require urgent reassessment, including repeat primary-survey review and senior surgical examination. Early bowel or mesenteric injury can be subtle. Unchanged hemoglobin does not exclude a developing nonhemorrhagic abdominal threat.

Choose the next action: If peritonitis or deterioration establishes an operative indication, do not delay for routine repeat imaging. If the patient remains supportable and findings remain equivocal, targeted re-imaging and close serial assessment may clarify the question under senior ownership. Observation requires explicit triggers and a monitored setting, not passive waiting or discharge based on the original report.

Clinical pearl
A CT report belongs to a moment in an evolving injury. New clinical evidence can change the plan without making the original scan a failure.

Section 6: final algorithm and review sources

6.10 A compact decision sequence

Repeat xABCDE and treat immediate threats. Identify the unresolved management question. Assess sustained physiology and support requirements. For persistent instability, use only rapid adjuncts needed to direct immediate control. For a supportable responder, select appropriate CT or targeted imaging without redundant preliminaries. Maintain resuscitation and a rescue plan during movement. Review findings with the clinical team, act on critical results and re-examine after the study.

Situation	Decision to preserve
Nonresponder with suspected bleeding	Control is the priority; a full imaging inventory is not mandatory first.
Transient responder	Reassess eligibility immediately; the scan environment and rescue capability matter.
Negative FAST	Continue injury-directed evaluation when suspicion remains.
Stable adult with suspected multiple blunt injuries	Consider an appropriate whole-body CT pathway.
Equivocal CT with evolving symptoms	Senior review, serial examination and targeted further evaluation; do not dismiss new findings.
Transfer needed	Avoid local studies that delay definitive care without changing pretransfer management; communicate images and unresolved questions.

Errors to recognize

Equating support-dependent pressure with stability; repeating bedside tests before already indicated CT; ordering a generic scan without an injury question; treating technically limited FAST as negative; finishing imaging despite collapse; assuming routine CT replaces dedicated studies; and failing to reconcile the final report with the bedside examination.

Sources and scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36, printed p. 325 (source PDF p. 672), with circulation context pp. 321-322. Original teaching tables and cases expand the discussion of adjuncts, targeted studies and repeated evaluation.

[2] NICE. Major trauma: assessment and initial management. NG39, recommendations 1.5.29-1.5.36 and chest-imaging recommendations. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Checked 2 November 2026. Selective verification of imaging by physiological response, FAST limitations and adult versus pediatric CT strategy.

Adult trauma teaching framework. Detailed radiological protocols and organ-specific operative indications require the appropriate local and specialist pathways. No single normal test replaces serial clinical assessment.

7. Secondary survey, mechanism and unrecognized injuries

7.1 Begin after immediate threats are addressed

The secondary survey is a systematic history and head-to-toe examination after the primary survey and initial resuscitation permit it. Its purpose is to identify significant injuries that were not the focus of immediate lifesaving treatment. Monitoring and resuscitation continue throughout. New deterioration interrupts the examination and returns the team to xABCDE. [1]

Before starting	Required judgment
Physiology	Immediate threats have been addressed and the patient can tolerate a more detailed assessment.
Leadership	A clinician coordinates findings and actions while monitoring continues.
Examination conditions	Provide analgesia, light, exposure, warmth, appropriate assistance and communication.
Limitations	State what sedation, pain, language, intoxication or injury prevents you from assessing.
Documentation	Record positive findings, relevant negatives, uncertainty and the plan for incomplete regions.

The secondary survey is not permission to delay an already indicated operation or transfer. When urgent treatment interrupts it, hand over exactly which elements remain incomplete and assign responsibility for completing them. A completed form does not establish that every region has been examined adequately.

7.2 Preserve dignity while obtaining essential information

Explain the examination, seek permission when possible and use appropriate privacy and chaperoning for intimate assessment. Exposure should be purposeful and followed by re-covering. Coordinate necessary movement to protect the spine, pelvis, airway and devices rather than turning the patient automatically to satisfy a sequence.

Clinical pearl
The secondary survey expands the search. It never removes the obligation to recognize a renewed primary-survey threat.

AMPLE history and mechanism: build hypotheses, not exclusions

7.3 Obtain history from more than one source

AMPLE item	Decision-relevant detail
Allergies	Agent and actual reaction; distinguish intolerance from a serious allergic response.
Medications	Anticoagulants, antiplatelets, beta blockers, insulin and other drugs affecting physiology or treatment.
Past illness / pregnancy	Relevant operations, baseline neurological function, comorbidity, pregnancy possibility and functional status.
Last meal	Timing and nature of intake for anesthesia planning; do not delay emergency treatment to satisfy an elective fasting interval.
Events / environment	Mechanism, timing, restraint, ejection, entrapment, exposure, collapse before impact and prehospital trajectory.

Ask the patient when possible, then reconcile prehospital reports, witnesses, family and available records. An unavailable history is unknown, not negative. Clarify whether a medical event preceded the injury: syncope, seizure, hypoglycemia or a cardiac event may require evaluation alongside the traumatic lesions. [1]

7.4 Mechanism changes suspicion

Determine energy transfer, direction, contact points and vulnerable anatomy. Deceleration raises concern for internal shear injury; a belt mark prompts careful abdominal evaluation; axial loading suggests associated spinal and lower-limb injury; crush and prolonged entrapment raise soft-tissue, compartment and metabolic concerns. These are prompts for assessment, not proof of a lesion.

A low-energy mechanism does not exclude serious injury in an older, frail or anticoagulated patient. Conversely, a dramatic mechanism does not require every available test without clinical reasoning. Integrate the mechanism with examination reliability, physiology and targeted investigations.

Clinical pearl
Mechanism tells you where to look harder. It cannot certify what is injured or safely exclude what is not.

A deliberate head-to-toe examination

7.5 Examine hidden regions and connect findings to actions

Region	Important assessment / consequence
Head and face	Inspect scalp, mouth and nose; assess vision, pupils and ocular movement when possible. New visual loss, tense orbital swelling or a septal hematoma needs prompt targeted assessment.
Neck	Assess wounds, swelling, voice change, tenderness and neurological concerns with appropriate motion protection. Evolving swelling may threaten the airway.
Chest	Reassess breathing, chest-wall injury, wounds and tenderness; reconsider pleural or cardiac injury when symptoms or physiology change.
Abdomen and pelvis	Inspect bruising and wounds, assess tenderness/distension and look for evolving peritonitis. Avoid repeated pelvic manipulation.
Perineum / concealed surfaces	Look for injury when indicated, including meatal blood or pelvic/perineal wounds; intimate or rectal examination should have a clinical indication.
Limbs and joints	Examine each limb, joints and adjacent regions; record distal perfusion, motor and sensation, including before and after reduction or splinting.
Back and neurological function	Complete safe posterior assessment and a more detailed neurological examination; document areas that remain inaccessible or untestable.

A palpable pulse does not exclude compartment syndrome or all arterial injury. Severe progressive pain, pain with passive stretch, tense swelling or evolving neurological findings require urgent reassessment. In an unconscious or heavily medicated patient, absence of a pain complaint is not reassuring; use the appropriate specialist evaluation pathway.

For penetrating trauma, account for wounds in skin folds, axillae, scalp, groin and buttocks as appropriate. Do not infer a safe internal trajectory by drawing a straight line between external wounds or by pairing entry and exit sites without evidence. Avoid blind probing of wounds. [1]

Clinical pearl
The most obvious fracture must not become the boundary of the examination.

Why injuries remain unrecognized

7.6 Separate a negative finding from an unreliable assessment

Failure mode	Practical countermeasure
Distracting injury / fixation	After addressing the dominant lesion, restart a systematic examination rather than relying on memory.
Sedation, intoxication or brain injury	Document limited reliability and repeat when the patient can participate.
Emergency surgery before full assessment	Record the incomplete survey and assign postoperative completion.
Transferred diagnosis accepted as complete	Review original images/reports and examine independently; clarify what was never assessed.
Early or subtle evolving injury	Use serial assessment and explicit escalation triggers rather than one-time reassurance.
Report / handover failure	Reconcile preliminary and final reports, acknowledge critical findings and close the treatment loop.

Initial CT is valuable but does not abolish diagnostic uncertainty. Some bowel, mesenteric, ligamentous and peripheral injuries may be subtle or outside the acquired field. New pain, focal tenderness, neurological change, inability to bear weight or unexplained physiology must be reconciled with the earlier findings, not dismissed because a scan was described as negative.

7.7 Use an unresolved-findings list

Maintain three categories: confirmed injuries with management plans; suspected or equivocal findings requiring decisions; and unexamined or unreliable regions requiring reassessment. Each unresolved item needs a named clinician, a next action, a timing or trigger and an escalation route. Incidental findings also need appropriate follow-up, but must not obscure urgent traumatic questions.

Clinical pearl
Not examined, not visible, not reported and normal are four different states. Handover should preserve the difference.

The tertiary survey and diagnostic closure

7.8 Repeat when the patient and the evidence become clearer

A tertiary survey revisits history, examination and investigations after the initial resuscitation and urgent procedures. Sabiston describes reassessment the day after admission and again when altered consciousness resolves. A practical pathway commonly targets the first 24 hours, with further examination after extubation or restoration of reliable participation. Do not wait for a scheduled survey when new symptoms appear. [1]

Review component	Output
History and mechanism	Resolve missing details, medication exposure and preinjury function.
Repeat examination	Head-to-toe review, including previously inaccessible regions and newly localizing symptoms.
Imaging reconciliation	Check final reports, acquisition coverage and discrepancies; obtain expert review when findings and examination conflict.
Laboratory / procedural review	Explain persistent abnormalities, operative findings and complications that may mimic additional injury.
Mobility and function	When safe and appropriate, identify pain or deficits emerging with participation and movement.
Updated injury list	Document new diagnoses and explicit plans for every unresolved question.

The survey is a process of reassessment, not a guarantee that nothing will emerge later. Research definitions of missed injury vary; discovering an injury during tertiary review is not identical to discovering one after the review or after discharge. Audit the timing, clinical significance and mechanism of delay rather than comparing unqualified percentages. [3]

Before discharge or transfer, ensure key final reports have been reviewed or that responsibility for pending results is explicitly accepted. Provide specific return advice for evolving pain, neurological symptoms, respiratory difficulty or other relevant warning signs, together with the planned follow-up and contact route.

Clinical pearl
Diagnostic closure requires an accountable plan for uncertainty, not a statement that all scans are normal.

Extended case: the fracture that concealed a second emergency

7.9 Reassess after the distracting injury is treated

A 44-year-old construction worker falls from a platform and lands on both feet before striking his torso. He arrives with a painful deformed right leg. Initial airway and breathing assessments are satisfactory. Blood pressure remains 122/76 mm Hg without escalating support, and the first FAST is negative. A displaced tibial fracture dominates the examination. The secondary survey is interrupted for urgent reduction and fixation because the skin is threatened. CT of the torso is reported without an acute major visceral injury. The patient receives substantial analgesia and later becomes easier to examine. During morning rounds he describes left heel pain and focal thoracolumbar discomfort. A resident attributes both to generalized bruising because the right leg operation went well and the torso CT was reassuring.

Meanwhile the right calf becomes increasingly tense. The foot remains warm with palpable pulses, but analgesic requirements rise and passive toe movement causes marked pain. The postoperative note contains no documented neurological or compartment comparison. Nursing staff ask whether the planned tertiary survey can wait until discharge because he has already had a full scan. The operative team is busy and the overnight trauma clinician assumes orthopedics has reviewed all symptoms.

Model judgment

Recognize a time-critical change: Progressive pain, tense swelling and pain on passive stretch require urgent compartment assessment. Palpable pulses do not exclude the diagnosis. Notify the responsible surgical team now; do not defer this to a scheduled survey.

Reconstruct the incomplete examination: The initial survey was interrupted and pain limited reliability. Axial loading and newly localizing heel/spinal symptoms justify targeted reassessment and review of actual CT coverage and reconstructions, followed by appropriate imaging or specialist assessment. A torso report does not evaluate every foot injury.

Close ownership gaps: Document pre- and postintervention neurovascular findings, assign review of new symptoms and complete the tertiary survey. Successful fixation is one completed treatment, not evidence that the injury list is complete.

Clinical pearl
The patient becoming examinable is a new diagnostic opportunity, not simply a sign that documentation can stop.

Extended case: a transferred injury list becomes an anchor

7.10 New evidence overrides a reassuring summary

A 73-year-old man taking an anticoagulant is transferred after a road collision. The referring note lists rib fractures and a stable pelvic fracture and says whole-body CT negative otherwise. He was initially confused and later intubated for respiratory deterioration. At the receiving center he is extubated the next morning, with stable pressure and improving oxygen requirements. He reports left hand weakness, increasing lower abdominal pain and difficulty seeing clearly from the right eye. The transfer packet includes preliminary reports but not all images. The receiving note copies the referring injury list. A final radiology addendum mentioning equivocal mesenteric change has not been acknowledged. A junior clinician assumes the hand complaint is an old problem, the abdominal pain is constipation and the visual complaint reflects lost glasses.

On repeat assessment the abdomen is more tender and the right eye is swollen; the onset of the hand deficit remains uncertain. No complete preintubation neurological examination is available. The patient is being considered for transfer to a lower-acuity ward. Family can describe his baseline function, but no one has yet spoken with them. Both hospitals believe the other team will review outstanding imaging.

Model judgment

Reopen the diagnostic task: These are unresolved neurological, visual and abdominal symptoms, not established benign explanations. Repeat immediate physiological assessment and perform urgent targeted examinations, with prompt specialist escalation for threatened vision or new focal deficit.

Reconcile evidence: Obtain the actual images and final reports, clarify the addendum with radiology and involve the appropriate surgeon for the evolving abdominal findings. If the examination establishes an urgent operative indication, do not delay for routine repeat imaging. Clarify baseline and symptom timing with family and prior clinicians.

Accept explicit responsibility: Pause the routine ward-transfer decision until urgent questions have a supportable plan. Name who reviews each pending result and who reassesses each symptom. Record the limitations of the earlier assessment and complete tertiary review after reliable participation returns.

Clinical pearl
A copied injury list is a handover hypothesis. It must be reconciled with the patient who is now in front of you.

Section 7: final review and sources

7.11 A practical sequence for preventing diagnostic delay

Confirm that immediate threats are controlled. Obtain AMPLE history and reconstruct the mechanism. Perform a systematic examination while monitoring continues. Record limitations and unresolved findings. Review relevant investigations and final reports. Repeat the assessment after resuscitation, procedures and return of reliable participation. Escalate new findings immediately. Before transfer or discharge, assign every pending result and follow-up task.

Trigger	Required response
Deterioration during secondary survey	Interrupt and repeat xABCDE.
Previously untestable patient now alert	Repeat history, neurological and head-to-toe assessment.
New pain / functional deficit	Targeted examination and injury-directed evaluation.
Clinical-imaging mismatch	Review images/protocol and seek appropriate expert input.
Preliminary-final report discrepancy	Acknowledge, communicate and document the changed plan.
Pending result at handover	Name the receiving clinician and escalation action.

Errors to recognize

Finishing a survey during renewed shock; equating mechanism with diagnosis; labeling an untestable region normal; overlooking the limb opposite the obvious fracture; excluding compartment syndrome because pulses are present; copying a transfer summary without reconciliation; and postponing urgent reassessment until a scheduled tertiary round.

Sources and scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36, printed pp. 324-325 (source PDF pp. 671-672). Secondary survey, AMPLE history, systematic examination, targeted adjuncts and tertiary reassessment. Tables and cases are original synthesis.

[2] Victorian State Trauma System. Early Trauma Care: Secondary Survey. https://trauma.reach.vic.gov.au/specialist/early-trauma-care/secondary-survey/. Used to cross-check timing after immediate threats and integration of mechanism and reassessment.

[3] Keijzers GB et al. A prospective evaluation of missed injuries in trauma patients, before and after formalising the trauma tertiary survey. https://pmc.ncbi.nlm.nih.gov/articles/PMC3889299/. Used for the distinction between detection during review and later missed-injury outcomes, not a universal guarantee of benefit. Sources checked 2 November 2026.

Adult educational framework. Detailed ocular, vascular, spinal and compartment emergencies follow the relevant trained specialist pathways. An urgent clinical concern should not wait for scheduled survey completion.

8. Operation, intervention, transfer and definitive care

8.1 Select the action that changes the dangerous trajectory

The next destination follows the untreated threat, physiological reserve and actual capability to deliver treatment. An operating room, angiography suite, intensive care unit or receiving trauma center is useful only when the required team and support are available in time. The decision is therefore about an intervention and its timing, not simply a location.

Decision variable	Question for the trauma leader
Threat	What is likely to cause death, irreversible ischemia or neurological loss next?
Trajectory	Is improvement sustained or dependent on increasing support?
Anatomy	What lesion or compartment is sufficiently established to direct treatment?
Capability	Which team can control it now, and what additional expertise is needed?
Delay	What is the likely harm of waiting for imaging, personnel or transfer?
Fallback	If the chosen approach fails, what rescue can occur immediately?

Persistent hemorrhagic instability, a convincing operative abdominal emergency, uncontrolled contamination, threatened limb perfusion or another time-critical lesion may require immediate intervention. The exact indication is injury-specific. A complete anatomical inventory is not a prerequisite when the available findings already justify urgent control. [1]

Conversely, physiology that permits investigation creates an opportunity for a more selective plan. Do not equate severe anatomical injury with mandatory laparotomy in every patient, or normal pressure with permission to observe without appropriate monitoring and rescue.

Clinical pearl
The correct destination is the place where the necessary action can happen soon enough, with support appropriate to the patient.

Operation, embolization and combined pathways

8.2 Match the treatment to what it can actually control

Approach	Useful role	Boundary
Open surgery	Rapid access to control bleeding, contamination or other surgically correctable threats.	A long definitive reconstruction may exceed the patient's current physiological reserve.
Endovascular intervention	Selected vascular lesions and arterial hemorrhage amenable to embolization or repair.	Does not treat every venous/bony bleeding source, bowel perforation or competing operative injury.
Combined / staged care	Addresses different injury components through coordinated operative and endovascular steps.	Requires explicit sequencing and immediate rescue rather than disconnected referrals.
Observation / nonoperative care	Selected injuries in a supportable patient with appropriate surveillance and escalation.	Unsafe when required monitoring or rescue is unavailable.

Choose the sequence from the dominant threat and time to effective treatment. In a patient with suspected abdominal contamination and arterial pelvic bleeding, an angiographic opportunity does not remove the abdominal question. Similarly, surgery may control one compartment while another still requires embolization. Communicate what each step is intended to accomplish and what remains untreated.

8.3 Avoid procedure-driven reasoning

An available technical procedure should not create its own indication. Ask whether the lesion is suitable, the patient can tolerate the setup and the intervention can be completed with definitive support. Temporary occlusion devices and other advanced bridges require trained systems and immediate control capability; they are not substitutes for arranging it.

Clinical pearl
The fastest procedure to start is not always the fastest route to effective control.

Damage control versus definitive repair

8.4 Limit the operation when physiology cannot support completion

Damage control is an intentional staged strategy: abbreviated control of hemorrhage and contamination, appropriate temporary management, resuscitation, and planned return for definitive treatment. Sabiston emphasizes both its lifesaving role in severe physiological derangement and the morbidity of unnecessary use. [1]

Decision point	Reasoning
Worsening physiology	Ongoing shock, cooling, acidosis, coagulopathy and escalating support can make prolonged reconstruction unsafe.
Complexity and duration	Consider whether definitive repair will consume reserve faster than resuscitation can restore it.
Adequate temporary endpoint	Ensure the abbreviated procedure has controlled the immediate threat rather than merely deferred uncontrolled bleeding.
Recovery and return plan	State what must improve, who reassesses and when reoperation is intended; deterioration may require earlier return.
Definitive repair possible	When physiology and injury permit safe completion, avoid unnecessary staging and its added morbidity.

Do not wait for every feature of the lethal triad or one numerical cutoff to justify stopping an unsafe operation. Equally, do not use damage control reflexively for every major injury. The decision integrates trajectory, bleeding, contamination, repair complexity, associated injuries and available expertise. [1,2]

Temporary abdominal closure, retained packs, bowel left in discontinuity or a temporary vascular shunt require a documented continuing plan. Record their presence, intended purpose, monitoring requirements and retrieval or definitive treatment plan. A staged operation creates obligations for the next team.

Clinical pearl
Damage control means a shorter operation with a complete rescue strategy, not an incomplete plan.

Nonoperative management is active treatment

8.5 Check eligibility, monitoring and rescue together

Selected injuries can be managed without immediate surgery when physiology, examination and imaging support that approach and the institution can detect and treat failure promptly. Injury grade alone does not establish suitability. An initially stable patient may still have a vascular lesion, evolving bowel injury or another condition needing targeted intervention.

Requirement	Explicit plan
Clinical eligibility	No current indication for urgent operation; explain relevant injury-specific uncertainties.
Surveillance	Define serial examination, physiology and selected laboratory/imaging reassessment.
Reliable setting	Choose a location with staffing and monitoring appropriate to deterioration risk.
Escalation	Specify findings that trigger senior review, repeat imaging, embolization or operation.
Rescue availability	Confirm blood, anesthesia, surgery and relevant interventional expertise are actually accessible.
Patient factors	Consider examination reliability, comorbidity, anticoagulation and competing injuries.

Increasing pain or tenderness, recurrent shock, continuing transfusion, falling hemoglobin in context or new organ dysfunction requires reassessment. Do not wait for a rigid single threshold if the clinical trajectory already indicates failure. Conversely, one laboratory change alone should be interpreted with examination, fluids and the full treatment course.

If local rescue is unavailable, early transfer may be necessary even while the patient looks stable. The relevant comparison is monitored care with timely rescue versus the delay created by discovering failure later in a setting unable to respond.

Clinical pearl
Observation is a treatment pathway with ownership, checkpoints and a failure response.

Transfer: coordinate early and treat time-critical threats

8.6 Compare the risk of delay with the risk of the journey

Identify missing capability early and communicate with the receiving service while resuscitation continues. Transfer preparation should not wait until local options are exhausted. Provide the mechanism, injuries, physiological trajectory, support requirements, treatments and unresolved questions. Confirm the receiving clinician, destination and transport arrangement. [3]

Before departure	Decision / preparation
Immediate threat	Perform necessary available lifesaving treatment when delay to the receiving center is intolerable.
Unnecessary delay	Avoid nonessential local tests or definitive procedures that do not improve transport safety or change immediate management.
Support en route	Secure airway, ventilation, access and devices; arrange appropriate blood/support, warmth, monitoring and skilled escort.
Information	Send images, reports, operative details, medications, times, response and outstanding results.
Contingency	Agree actions for deterioration, equipment failure or diversion; communicate a major change before departure.
Reassessment	Repeat the primary survey and confirm that the current transport plan still matches the patient.

Do not demand normalization of every variable before transfer when definitive treatment is the only way to correct the problem. Do not send a rapidly collapsing patient on a long journey merely because a specialist center has accepted them if an essential lifesaving intervention can and must be performed locally. These decisions require senior coordination, actual capability and realistic timing, not a universal transport rule.

Clinical pearl
Acceptance by a receiving hospital establishes a destination. It does not by itself establish readiness for the journey.

Definitive care and the next handover

8.7 Completion of a procedure is not completion of care

After control, reassess whether perfusion is improving, support requirements are decreasing and the intervention achieved its intended endpoint. Persistent deterioration may reflect ongoing bleeding, another compartment, obstruction, cardiac dysfunction or a treatment complication. Do not attribute every abnormality to residual shock without reconsidering correctable causes.

Handover domain	Required information
What was controlled	Lesion, procedure, evidence of success and residual uncertainty.
What remains temporary	Packs, shunts, temporary closure, external stabilization or incomplete reconstruction.
Physiology	Blood use, support, ventilation, temperature, metabolic/coagulation trajectory and important complications.
Next decision	Reoperation, further intervention, imaging or specialist assessment, with ownership and triggers.
Whole-patient care	Completion of surveys, pain control, nutrition, prophylaxis when appropriate, mobility and rehabilitation planning.
Communication	Explain the staged or definitive plan to patient/family when feasible, including uncertainty and foreseeable next steps.

Intensive care continues resuscitation and surveillance; it is not an appropriate substitute for needed source control. A patient with an open abdomen or another staged injury requires active coordination among surgery, anesthesia, intensive care and relevant specialists. Reoperation timing follows the injury and trajectory through the local pathway, with urgent return if control fails.

Document an updated injury list and pending reports. Review the definitive radiology interpretation and complete tertiary assessment when feasible. Once bleeding and other contraindications permit, integrate prevention of avoidable complications and rehabilitation into the plan rather than treating them as unrelated later tasks.

Clinical pearl
A definitive-care plan states what is finished, what is still temporary and what finding changes the next step.

Extended case: local control or immediate transfer?

8.8 Choose the shortest achievable route to lifesaving treatment

A 28-year-old man arrives at a district hospital after penetrating abdominal trauma. He is intubated, with pressure 78/44 mm Hg despite ongoing emergency blood support. FAST shows intraperitoneal fluid and the abdomen is increasingly distended. The on-call surgeon and anesthetist can begin laparotomy promptly; emergency blood and postoperative ventilatory support are available, but complex vascular reconstruction is not. The regional center has accepted him and estimates 80 minutes to arrival after dispatch. A colleague argues that all major trauma should go directly to the specialist center and proposes departure without local intervention. Another suggests a prolonged definitive operation locally to avoid a second procedure. The surgeon must decide what the local hospital can safely accomplish before specialist care.

During preparation pressure briefly rises, then falls again. Temperature is 34.6 C and coagulation results are worsening. The receiving surgeon asks whether bleeding has been controlled and offers real-time coordination. The transport team can deliver blood but cannot perform operative hemorrhage control en route.

Model judgment

Identify the immediate hazard: This is uncontrolled suspected intra-abdominal hemorrhage with persistent instability. A long transfer without control may be unsurvivable. Confirm available local capability and proceed with necessary lifesaving control while coordinating with the regional surgeon, rather than delaying for routine CT.

Choose a proportionate endpoint: Obtain rapid hemorrhage and contamination control within the team's competence. Worsening physiology argues against a long reconstruction. If staged temporary management is needed, ensure an appropriate endpoint and ongoing resuscitation before transfer; do not leave correctable uncontrolled bleeding simply to shorten operating time.

Make transfer concrete: Communicate operative findings, temporary measures, blood use and residual needs. Reassess transport support and destination after the operation, with an explicit definitive-treatment and reoperation plan.

Clinical pearl
Early transfer coordination and necessary local lifesaving treatment are compatible parts of the same rescue plan.

Extended case: stable anatomy, inadequate rescue capability

8.9 A nonoperative option depends on the system that supports it

A 59-year-old woman sustains blunt abdominal trauma. After initial support her pressure remains 118/70 mm Hg, pulse 92/min and lactate is improving. Contrast CT shows a substantial solid-organ injury with a focal arterial bleeding concern but no convincing bowel injury. She is alert with localized tenderness and no peritonitis. The hospital has an operating team, but interventional radiology will not be available until the next morning. The referral center can provide embolization and specialist observation and is 55 minutes away with a critical-care transport team. A resident proposes ward observation because her blood pressure is normal. Another recommends immediate organ removal solely because the CT injury appears severe. The senior surgeon must balance preservation, treatment delay and rescue capacity.

A second unit of blood has been given during the first hour, but the patient has not required escalating support over the last 30 minutes. The radiologist requests direct discussion of the arterial finding. Blood is available locally, the operating team can remain ready and transport can depart soon. The patient asks why she needs transfer if she currently feels better.

Model judgment

Clarify the lesion and trajectory: Discuss the arterial finding, injury-specific options and associated injuries. Sustained improvement permits deliberate planning but does not make a vascular bleeding concern irrelevant. Severe anatomical grade alone does not mandate immediate organ removal.

Account for rescue capability: Routine ward observation without suitable monitoring or an available intervention plan is inadequate. Arrange early specialist transfer for appropriate embolization and monitored care if the journey remains supportable, maintaining local operative readiness and blood support until departure.

Set the condition for changing course: Recurrent instability, increasing support or a new operative indication may require immediate local control rather than continuing the transfer plan. Explain to the patient that transfer provides access to the treatment and rescue options her injury may need, even while current physiology is improved.

Clinical pearl
The same anatomical injury can justify different immediate plans when access to monitoring and rescue differs.

Section 8: final review and sources

8.10 State the decision, its deadline and its fallback

Question	Required output
Does the patient need control now?	Identify the operative, endovascular or other time-critical threat.
Can definitive repair be tolerated?	Choose definitive or staged care from physiology and complexity.
Is nonoperative care supportable?	Confirm surveillance, failure triggers and timely rescue.
Is capability missing?	Start senior referral and transport coordination early.
Can the patient tolerate the journey?	Reassess immediate treatment needs and support en route.
What happens after control?	Specify residual injuries, temporary measures and the next definitive step.

Errors to recognize

Waiting for complete imaging despite an established intervention indication; choosing a procedure because it is available; treating embolization as a solution for all bleeding mechanisms; extending reconstruction during physiological collapse; using damage control without a return plan; calling unsupported observation conservative care; and confusing transfer acceptance with transport safety.

Sources and scope

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36. Core damage-control discussion: printed p. 325 (source PDF p. 672); circulation/source-control context pp. 321-322. Cases and decision tables are original synthesis, not reproduced textbook algorithms.

[2] NICE. Major trauma: assessment and initial management. NG39, recommendations 1.5.37-1.5.39. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Selected cross-check of damage-control versus definitive operative strategy by response to resuscitation.

[3] NICE. Major trauma: service delivery. NG40, transfer between emergency departments and specialist definitive care. https://www.nice.org.uk/guidance/ng40/chapter/recommendations. Sources checked 2 November 2026.

Adult educational framework. Organ-specific embolization criteria, technical procedures, transport standards and thresholds for reoperation require the relevant trained institutional pathways. The cases illustrate judgments under stated capabilities rather than universal rules for every hospital.

9. Special circumstances and difficult trauma judgments

9.1 Preserve priorities while adapting the interpretation

Special circumstances change how injury presents, how reliably the examination can be interpreted and what support is required. They do not remove the need to identify immediate threats, control hemorrhage and reassess response. This section applies the Sabiston primary-survey and reassessment framework to selected populations, with explicitly identified supplementary guidance. [1-5]

Context	Potentially misleading feature	Judgment adjustment
Older / frail patient	Minor mechanism, modest pulse or seemingly acceptable pressure.	Compare baseline and reserve; look for occult injury and impaired perfusion.
Pregnancy	Altered anatomy and apparently reassuring maternal observations.	Prioritize maternal resuscitation and add appropriate obstetric/fetal assessment.
Child	Preserved pressure despite physiological stress; limited communication.	Use age-appropriate interpretation, equipment, dosing and expertise.
Anticoagulation	Normal routine coagulation results or uncertain medication history.	Determine the actual agent and clinically relevant exposure.
Unreliable examination	Intoxication, sedation, language barriers, dementia or paralysis.	Record limitations and arrange repeat assessment rather than labeling findings normal.
Limited resources	Temporary improvement mistaken for an adequate local care pathway.	Plan monitoring, rescue and transfer from actual capability.

The recurring task is to distinguish adaptation from exception-making. A lower threshold for reassessment may be justified; indiscriminate procedures are not. Ask what feature of this patient makes the standard signal unreliable and what additional evidence or safeguard addresses that problem.

Clinical pearl
Adapt the interpretation and support. Keep the obligation to recognize deterioration and deliver timely control.

Older adults: reserve, baseline and goals of care

9.2 Normal-looking numbers may conceal substantial injury

Older adults may have serious injury after lower-energy trauma. Beta blockade, pacing and other factors can blunt tachycardia; chronic hypertension can make a seemingly normal pressure relatively low. Frailty, comorbidity and anticoagulant exposure influence risk independently of chronological age. Interpret examination, perfusion, baseline function and trajectory together. [2]

Assessment	Decision value
Baseline cognition and function	Distinguish new confusion or weakness from previous disability; obtain collateral history.
Medication reconciliation	Identify anticoagulants, antiplatelets and drugs that alter physiological responses.
Frailty and comorbidity	Anticipate reduced reserve, delirium, respiratory complications and rehabilitation needs.
Mechanism and symptoms	Do not let a ground-level fall exclude head, spine, pelvic or other important injury.
Response to support	Avoid both under-recognition of shock and uncritical repeated fluid administration in limited cardiac reserve.

9.3 Discuss proportional treatment without age-based shortcuts

Seek the patient's preferences, available advance-care information and an appropriate surrogate when needed. Clarify the meaning of a treatment limitation: a resuscitation order is not automatically a refusal of surgery, transfusion, analgesia or other indicated treatment. Consider reversible injury, expected functional outcome and the burdens of treatment. Avoid declaring futility solely from age or an early confounded examination.

Provide analgesia and monitor its effects rather than withholding it to preserve an examination. Use repeated assessment, attention to hearing/vision and delirium prevention to improve reliability. When the patient cannot describe symptoms well, unexplained physiological or functional change deserves investigation.

Clinical pearl
Frailty informs the plan and the conversation. It does not replace assessment of a reversible threat.

Anticoagulants, antiplatelets and uncertain exposure

9.4 Identify the drug before selecting reversal

Determine the medication, indication, last dose, renal function and potential interactions. Ask family, pharmacy or available records when the history is unreliable. A normal PT/INR or aPTT does not exclude every clinically important direct oral anticoagulant effect. Agent-appropriate testing can help when available, but must not delay urgent hemorrhage control. [2]

Problem	Reasoned response
Major bleeding with relevant exposure	Coordinate rapid agent-specific reversal through the current institutional pathway while controlling the source.
Unknown drug / dose	Actively resolve the history and obtain expert support rather than giving an arbitrary universal antidote.
Antiplatelet use	Do not assume anticoagulant reversal treats platelet inhibition; tailor management to the injury, bleeding and planned procedure.
No active or suspected major bleeding	Do not reverse reflexively solely because a drug appears on the medication list.
After bleeding control	Revisit thrombosis risk, prophylaxis and eventual resumption through an individualized multidisciplinary plan.

Choice and availability of reversal products can change and vary by jurisdiction. Use the current agent-specific protocol rather than extrapolating one product to every drug. Reversal does not drain an intracranial hematoma, stop a disrupted artery or remove the need for procedural control.

Judgment under competing risks

An indication such as a mechanical valve or recent thrombosis raises the consequences of reversal and interruption, but does not justify leaving life-threatening bleeding untreated. State the immediate priority, obtain relevant expertise and make the later reassessment explicit. Record the reversal given and communicate it to the receiving team.

Clinical pearl
Treat the bleeding lesion and the drug effect together. Neither task substitutes for the other.

Pregnancy: coordinated maternal and obstetric assessment

9.5 Maternal resuscitation remains the first priority

Recognize pregnancy when possible, involve obstetric expertise early and adapt positioning in later gestation to reduce aortocaval compression while maintaining necessary spinal protection. Preserve maternal oxygenation and perfusion; an apparently reassuring fetal observation does not establish maternal stability. [3,4]

Decision	Practical implication
Imaging	Do not withhold medically indicated diagnostic imaging solely because of pregnancy; select an appropriate protocol with radiology.
Fetal assessment	After rapid maternal assessment and primary-survey priorities, add gestation-appropriate obstetric evaluation and monitoring.
Observation	A viable pregnancy requires formal observation through the obstetric pathway; EAST 2025 conditionally supports at least 4-6 hours, with longer care when concerning features persist.
Bleeding / contractions / uterine pain	Consider obstetric injury, including abruption, alongside maternal traumatic lesions; normal initial ultrasound does not settle every concern.
Rh status	Assess Rh status and anti-D requirements with obstetrics; fetomaternal hemorrhage testing may guide dosing when indicated.

Maternal injury control and fetal care require coordinated priorities rather than separate sequential teams. If transfer is needed, match the receiving center to maternal trauma capability and obstetric/neonatal needs. Do not delay treatment of maternal hemorrhage to finish fetal testing.

Maternal traumatic arrest is a distinct emergency requiring immediate activation of the trained maternal-resuscitation pathway, including assessment for resuscitative hysterotomy when indicated. This is not an ordinary interhospital-transfer decision. Detailed timing and technique require team preparation and the applicable emergency protocol.

Clinical pearl
Pregnancy changes the team and assessment. Necessary maternal diagnosis and treatment remain central to fetal survival.

Children and patients whose examination is unreliable

9.6 Do not apply adult thresholds and logistics automatically

Children can preserve blood pressure until advanced circulatory compromise. Interpret perfusion using age-appropriate physiology and serial examination, not an adult pressure threshold alone. Use weight-based drug and blood protocols, suitable airway/access equipment and early pediatric expertise. Small size increases the importance of precise preparation and temperature protection.

Choose imaging from the injury question and pediatric pathway. NICE advises against routine whole-body CT in children; this does not mean withholding targeted CT when indicated. Consider development, communication, distracting pain and the reliability of observation. [5]

Barrier	Safeguard
Intoxication / sedatives	Continue injury evaluation; document drug timing and repeat the examination when reliable.
Dementia / communication difficulty	Obtain baseline and use communication support or an interpreter; do not infer absence of symptoms.
Paralysis / severe brain injury	Use objective findings and appropriate adjuncts; record what cannot be tested.
Obesity / difficult access	Plan positioning, equipment, imaging quality and safe transport capacity before a failed attempt creates delay.
Possible abuse / assault	Treat urgent injury, document findings objectively and use the appropriate safeguarding pathway.

For children and vulnerable adults, a concerning mismatch between history, developmental ability and injury pattern warrants safeguarding assessment. Ask necessary questions respectfully without conducting repeated accusatory interviews. Preserve privacy and coordinate appropriate specialist support.

Clinical pearl
An unreliable examination increases the need for a documented reassessment plan; it does not make the result negative.

Extended case: anticoagulation, frailty and a misleading mechanism

9.7 Separate proportional care from premature limitation

An 84-year-old woman falls from standing and arrives with hip pain. She takes apixaban and a beta blocker and has chronic kidney disease. Her usual systolic pressure is about 160 mm Hg; arrival pressure is 116/68 with pulse 70/min. She is quieter than usual, with cool hands and an enlarging flank bruise. Hemoglobin is 11.6 g/dL, INR 1.1 and the first FAST is negative. A resident proposes a routine orthopedic pathway because the mechanism was minor and coagulation appears normal. Her daughter reports that she normally lives independently and has an advance document declining CPR, but has previously accepted major surgery. The local hospital can provide emergency blood and surgery but not immediate embolization.

During assessment she becomes more confused and the pressure falls to 94/56. The last apixaban dose is uncertain. A colleague suggests avoiding escalation because of age and the resuscitation limitation; another proposes transfer without further treatment because the referral center has vascular expertise. The transport journey is expected to take more than an hour.

Model judgment

Recognize occult physiological deterioration: Relative hypotension, cool peripheries and worsening cognition outweigh the reassuring pulse, early hemoglobin and low-energy label. Negative FAST does not exclude retroperitoneal hemorrhage; normal INR does not exclude relevant apixaban effect.

Act and clarify simultaneously: Reassess xABCDE, activate appropriate blood support and obtain urgent source-directed evaluation. Resolve exposure and renal context and arrange agent-specific reversal for major bleeding when indicated. Involve senior surgical and receiving expertise early; decide on local lifesaving control versus a supportable transfer from trajectory and available capability.

Respect the actual preference: Clarify the advance document and speak with the patient if possible. Declining CPR is not a blanket refusal of reversible injury treatment. Explain likely benefits, burdens and uncertainty without substituting age for individualized judgment.

Clinical pearl
A minor mechanism, normal pulse and treatment-limitation label can combine into powerful false reassurance.

Extended case: maternal concern versus diagnostic delay

9.8 A fetal question must not conceal maternal hemorrhage

A 29-year-old at 30 weeks of pregnancy arrives after a restrained collision. She is alert, with abdominal pain and a belt mark. Pressure is 108/66 mm Hg and pulse 112/min. She has cool extremities, increasing tenderness and an initial negative FAST. A brief fetal assessment detects a heart rate, and the family asks that no CT be performed because of radiation. The team has obstetric support but is awaiting the trauma surgeon. A resident proposes prolonged fetal observation before further maternal investigation. Another clinician suggests that any abdominal CT should wait until MRI becomes available later that evening. Blood has been drawn but treatment has not escalated.

Twenty minutes later maternal pressure is 92/54 and she is more anxious. Obstetric monitoring is concerning but has not established the cause. There is no large external blood loss. The hospital has immediate operating and CT capability; a center with higher-level neonatal support is 70 minutes away. A colleague proposes immediate transfer solely because the fetus may need specialized care.

Model judgment

Reprioritize maternal physiology: Repeat immediate assessment, support oxygenation/perfusion and urgently evaluate hemorrhage. Reassess positioning for aortocaval compression while preserving injury precautions. Fetal cardiac activity and negative FAST do not establish maternal safety.

Choose diagnosis or control from the trajectory: If supportable, obtain the medically indicated maternal imaging with appropriate radiology input and concise counseling. Do not delay for MRI solely to avoid radiation. If deterioration and findings establish a need for urgent control, proceed through the operative pathway without a routine CT detour.

Coordinate both teams: Continue obstetric assessment for abruption and other complications while trauma treatment proceeds. Plan referral around maternal transport tolerance and both maternal and neonatal capability. An unstable patient must not be sent on a long journey merely because the receiving neonatal service is preferable.

Clinical pearl
The family's understandable concern deserves explanation and involvement, while the team actively addresses the immediate maternal threat.

Section 9: judgment checklist and sources

9.9 Identify what makes this patient different

Question	Expected action
Which usual sign is unreliable?	Interpret baseline, medications, age and examination conditions.
Which threat could be hidden?	Extend source assessment and targeted investigation as indicated.
What support needs adaptation?	Use appropriate equipment, dosing, positioning and specialist input.
What remains uncertain?	Document a repeat examination or diagnostic plan with ownership.
What does the patient want?	Clarify capacity, preferences and the actual scope of treatment limitations.
Can this setting rescue deterioration?	Arrange early escalation or transfer while preserving essential immediate care.

Sources and boundaries

[1] Henry SM et al. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36. General framework from printed pp. 321-325: shock interpretation, AMPLE history including pregnancy, examination limitations and reassessment. Population-specific material below is supplementary synthesis, not a claim that this chapter provides a full special-populations protocol.

[2] WSES. The 2023 WSES guidelines on the management of trauma in elderly and frail patients. Published 2024. https://pmc.ncbi.nlm.nih.gov/articles/PMC11140935/. Geriatric risk, frailty, anticoagulant exposure and individualized management. Reversal products must follow current local availability and agent-specific guidance.

[3] Appelbaum RD et al. Trauma in pregnancy: systematic review, meta-analysis and EAST practice management guideline. J Trauma Acute Care Surg. 2025;99:298-309. https://www.east.org/education-resources/practice-management-guidelines/details/trauma-in-pregnancy-a-systematic-review-metaanalysis-and-practice-management-guideline-from-the-east. Conditional recommendations are identified in the text.

[4] Qamar SR et al. CETARS/CAR Practice Guideline on Imaging the Pregnant Trauma Patient. 2024. doi:10.1177/08465371241254966. Maternal imaging and radiation/contrast considerations.

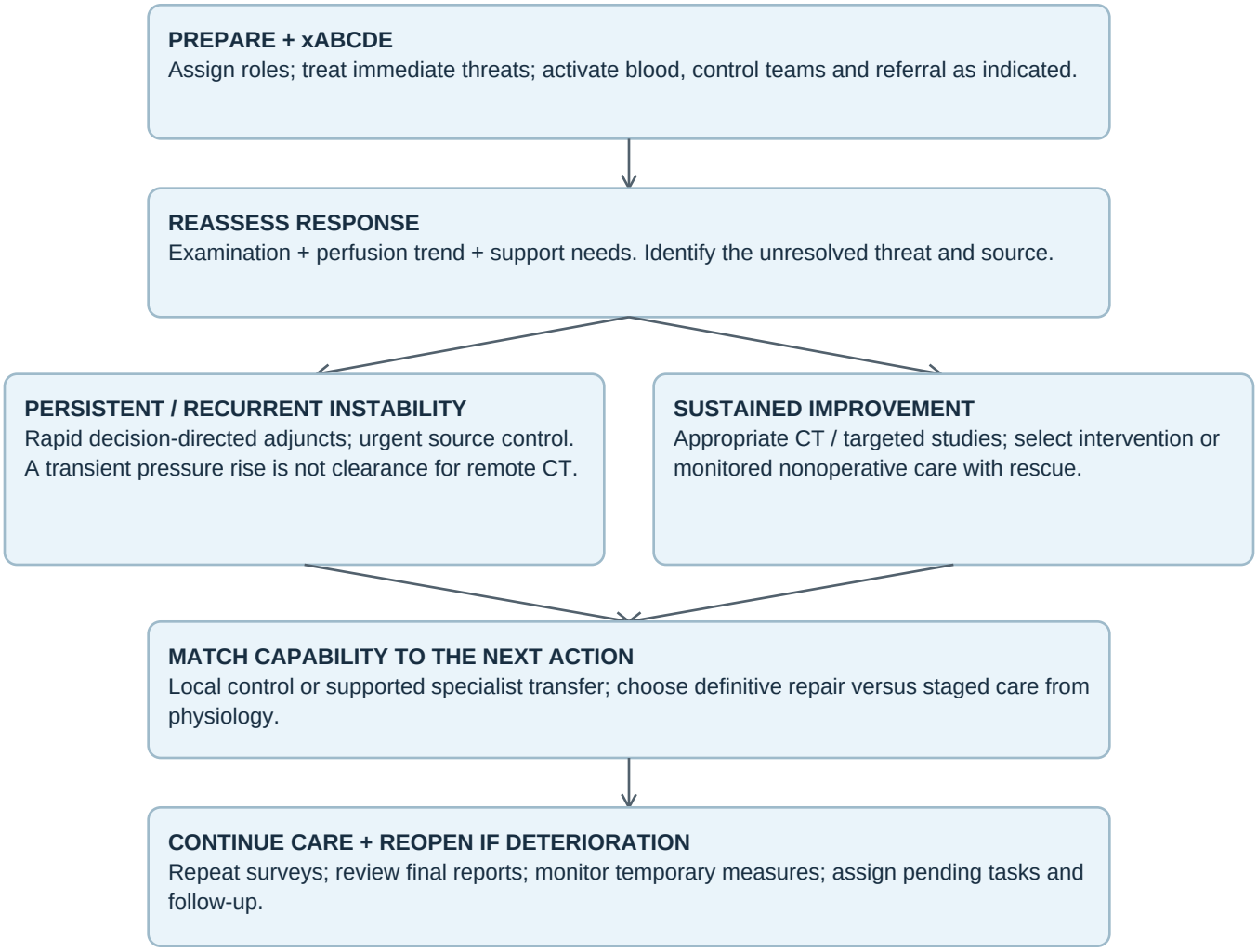
[5] NICE. Major trauma: assessment and initial management. NG39, pediatric imaging guidance. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Sources checked 2 November 2026.

The cases and tables are original educational material. Pediatric resuscitation, obstetric emergencies, safeguarding and drug reversal require the corresponding trained specialist pathways.

10. Integrated algorithm and final review tables

10.1 From arrival to definitive care

Use this original synthesis as a decision map alongside the detailed sections. Assessment, treatment and resource activation run in parallel. Any deterioration returns the team to immediate threats; the pathway is not a once-only checklist. [1,2]



Clinical pearl
At every branch ask: what must happen now, who owns it, and what finding will change the plan?

Primary-survey decisions: threat, action and proof of effect

10.2 The xABCDE review matrix

Priority	Immediate question	Action and reassessment
x: external hemorrhage	Is accessible blood loss immediately lethal?	Control with appropriate pressure/packing or indicated tourniquet; confirm effectiveness and timing.
A: airway / cervical protection	Can the patient maintain and protect the airway now and during the next step?	Support oxygenation, suction and secure the airway when indicated; protect the spine, confirm tube position and anticipate shock.
B: breathing	Is ventilation or oxygenation threatened by a reversible chest problem?	Treat a convincing unstable pleural threat without harmful imaging delay; verify drainage, ventilation and response.
C: circulation	Is perfusion inadequate and where is blood being lost?	Control sources, deliver appropriate blood support and mobilize definitive care; reassess trajectory and competing shock causes.
D: disability	Is consciousness or focal neurological function changing?	Record component responses/pupils, check reversible causes and protect brain perfusion; escalate new deficits.
E: exposure / environment	What is concealed, and is the patient cooling?	Examine safely, re-cover, warm and monitor temperature; assign incomplete examination.

Treatment is incomplete until its effect is assessed

An order is not a completed action; a completed action is not proof of success. After an important intervention compare the threatened function with its pretreatment state. If improvement is absent or temporary, check technical failure, an incorrect working diagnosis and a second untreated mechanism.

Clinical pearl
A useful primary-survey report states the threat, treatment, response and unresolved decision.

Response, imaging and source-control choices

10.3 Read the trajectory rather than a snapshot

Trajectory	Interpretation	Decision emphasis
Sustained responder	Improvement persists without escalating support.	Appropriate imaging can define injuries; continue surveillance.
Transient responder	Improvement is followed by recurrent shock or maintained only by increasing support.	Reassess uncontrolled loss and rescue capability; accelerate control.
Poor / nonresponder	Perfusion remains inadequate despite initial support.	Verify treatment delivery and urgently address bleeding, obstruction or mixed shock.

10.4 Match the question to the test

Finding / context	Interpretation and next action
Negative FAST	Does not exclude important hemorrhage or bowel/retroperitoneal injury; continue clinically directed evaluation.
Positive FAST with persistent shock	Consider urgent operative control in the compatible setting; routine CT confirmation may add harmful delay.
Supportable adult with suspected multiple blunt injuries	Use an appropriate CT pathway without redundant preliminary tests.
New deterioration during a scan	Stop, reassess and treat; completing images is no longer the priority.
Equivocal imaging with evolving symptoms	Senior reassessment and targeted further evaluation; an established operative indication need not await another scan.

For a transient responder, scanner location, ongoing support and immediate rescue affect what is tolerable. This category is not an absolute imaging prohibition or an automatic permission. The leader must state why the proposed study is useful and supportable.

Clinical pearl
If more support is needed to preserve the same pressure, the trajectory has not improved.

Hemorrhage, resuscitation and operative strategy

10.5 Integrate the source search with the bridge to control

Task	Review point
Search sources	External wounds, chest, abdomen, pelvis/retroperitoneum and long-bone/soft-tissue compartments; more than one can bleed.
Begin support	Reliable access and early major-hemorrhage activation when indicated; blood-based hemostatic support through the local pathway.
Prevent deterioration	Warm patient/products; monitor calcium, acid-base and coagulation trajectory; adapt treatment to deficits.
Use adjuncts deliberately	Early-window TXA and agent-specific reversal when indicated; neither replaces mechanical source control.
Individualize perfusion	Restrictive support before control may suit selected bleeding adults; brain/spinal injury and patient context alter the goals.
Avoid false rescue	Repeated crystalloid or pressors cannot make an uncontrolled lesion safe.

10.6 Choose the treatment endpoint

Pathway	Necessary conditions / obligations
Definitive repair	The lesion, physiology and capability permit safe completion.
Damage control	Abbreviate when prolonged repair is unsafe; control immediate threats and document temporary measures and return plan.
Endovascular care	Treat a suitable lesion with timely access and rescue; retain a plan for other bleeding or contamination.
Nonoperative management	Appropriate injury selection, reliable monitoring, explicit failure triggers and prompt intervention capability.

Clinical pearl
The endpoint is effective control with a supportable next step, not simply departure from the resuscitation room.

Transfer, reassessment and special-population safeguards

10.7 The next team must inherit the uncertainty as well as the diagnosis

Transition	Required information / action
Before transfer	Receiving clinician and destination; necessary local lifesaving treatment; support, escort and deterioration plan.
After an operation	What was controlled, what remains temporary, current physiology and explicit reoperation/escalation decisions.
Secondary survey	AMPLE history, mechanism, systematic examination and documented limitations while monitoring continues.
Tertiary review	Repeat examination, final-report reconciliation, new symptoms and completion when participation improves.
Discharge / ward transfer	Pending-result ownership, appropriate surveillance and follow-up; do not hand over unresolved urgent threats as routine tasks.

10.8 Signals that require adjusted interpretation

Context	Safeguard
Older / frail or beta-blocked	Consider relative hypotension, baseline function and muted tachycardia.
Anticoagulant exposure	Identify agent and timing; normal routine tests may not exclude a DOAC effect.
Pregnancy	Prioritize maternal resuscitation and indicated diagnosis with coordinated obstetric care.
Child	Use age/weight-specific assessment and treatment; avoid routine adult whole-body CT protocols.
Sedated / intoxicated / communication barrier	Describe testability and repeat assessment; do not label an unreliable examination normal.

Clinical pearl
A handover should contain confirmed injuries, unresolved findings and unexamined regions, each with an accountable plan.

Cognitive traps and a final surgeon judgment check

10.9 Replace the shortcut with an observable decision

Tempting shortcut	Better question
The pressure is normal.	What support is required to maintain it, and is tissue perfusion improving?
FAST is negative.	Which injuries or bleeding compartments remain unevaluated?
The hemoglobin is unchanged.	Could acute loss or an evolving nonhemorrhagic injury still be present?
The tube / drain is in.	Has its position and function been checked, and did physiology improve?
The scan was negative.	Was the relevant region/protocol assessed, and have symptoms evolved?
The fracture explains the pain.	Have other limbs, adjacent joints, spine and compartments been examined?
The center has accepted transfer.	What must be treated locally and what support makes the journey tolerable?
The operation is finished.	What remains temporary or uncontrolled, and who owns the next decision?
The survey is complete.	Were findings reliable, final reports reviewed and limitations resolved?

10.10 The final six questions

1. What threatens the patient next? **2.** What evidence supports that explanation and what contradicts it? **3.** What action cannot safely wait? **4.** Can this team deliver it in time? **5.** What constitutes success or failure? **6.** Who reassesses, and where does the patient go if the plan fails?

These questions describe clinical reasoning rather than a validated prediction score. They cannot replace injury-specific assessment or trained procedural pathways.

Clinical pearl
Good judgment is visible in the prioritization, the response to conflicting evidence and the explicit plan for failure.

Chapter review map and reference boundaries

10.11 Return to the detailed section when a decision remains unclear

Section	Pages	Review focus
1. Principles and team preparation	1-10	Roles, resources, xABCDE and initial coordination.
2. Airway and cervical protection	11-19	Airway adequacy, difficult physiology, confirmation and rescue.
3. Breathing / chest threats	20-29	Pleural emergencies, hemorrhage and respiratory deterioration.
4. Circulation and hemorrhage	30-38	Source search, blood support and treatment response.
5. Disability and exposure	39-47	Neurological interpretation, secondary injury and warming.
6. Adjuncts and imaging	48-55	FAST limitations, CT eligibility and evolving findings.
7. Secondary / tertiary assessment	56-63	Mechanism, systematic review and missed-injury prevention.
8. Intervention and definitive care	64-72	Operation, staging, observation and transfer.
9. Special circumstances	73-80	Frailty, drugs, pregnancy, childhood and unreliable examination.
10. Integrated review	81-87	Decision map, comparison tables and judgment checks.

Source boundaries

[1] Henry SM, Harfouche M, Broderick M, Rejowski B, Whitehurst B, Sutyak JP. Management of Acute Trauma. Sabiston Textbook of Surgery, 22nd ed., chapter 36, beginning p. 301. This review consolidates the source-grounded teaching developed in Sections 1-9; it does not replace the complete organ-specific trauma chapter.

[2] NICE. Major trauma: assessment and initial management. NG39, especially imaging and operative-strategy recommendations 1.5.29-1.5.39. https://www.nice.org.uk/guidance/ng39/chapter/recommendations. Verified 2 November 2026. Other supplementary primary sources are identified in the relevant preceding sections.

The flow diagram, tables, case analyses and review questions are original educational synthesis. Apply local trained pathways for procedures, blood products, reversal, pediatric/obstetric care and transport. The next assessment section can use long cases to test prioritization, competing explanations, response to treatment and rescue planning.

11. One hundred extended surgical judgment questions

How to use this assessment

This bank contains 100 original single-best-answer questions arranged across ten domains. Every question includes a long scenario, four options, an explanatory answer and individual option analysis. The situations test the next defensible decision under the capabilities and constraints stated, rather than recognition of one isolated fact.

Questions	Domain
1-10	Team preparation, leadership and priorities
11-20	Airway and cervical protection
21-30	Breathing and chest threats
31-40	Circulation and hemorrhage
41-50	Disability, exposure and temperature
51-60	Adjuncts and imaging
61-70	Secondary survey and missed injuries
71-80	Intervention, staging and nonoperative care
81-90	Transfer and limited resources
91-100	Special populations and integrated judgment

First commit to an option and state the threat, the evidence that changes the plan and the fallback if your chosen action fails. Then read the analysis. Some alternatives could become appropriate later or in a different setting; their timing, indication or incompleteness makes them inferior in the scenario given.

Answer explanations appear immediately beneath each question. A compact answer key follows Question 100. These educational items have not been prospectively validated or calibrated for examination difficulty; they should not be used alone for high-stakes competence decisions.

The assessment applies the principles developed in Sections 1-10. Sabiston Chapter 36 is the core source framework; supplementary guidance is explicitly identified in those sections, including NICE NG39/NG40, ACS brain-injury guidance, WSES geriatric guidance and EAST 2025 pregnancy guidance. Cases, choices and analyses are original synthesis.

Question 1 | Team preparation and priority

A 34-year-old arrives after a collision with a bleeding thigh wound, shallow breathing and pressure 82/46 mm Hg. Two clinicians begin difficult intravenous access while nobody controls the wound. The leader is looking for an ultrasound probe. Emergency blood is available, but the operating team has not been alerted. A nurse reports that the dressing is rapidly saturating and asks which task should take precedence. The airway clinician can begin assessment now, and another nurse can deliver blood once instructed. The patient is still making purposeful movements, but the team has no shared account of whether bleeding is controlled. The nearest definitive team needs an early activation call rather than a complete diagnostic label. The surgeon must restore coordination without delaying treatment already underway. Select the single best next decision under the capabilities and constraints described. Which leadership action is best now?

A. Assign immediate hemorrhage control and parallel airway/resuscitation tasks, while activating definitive help.

B. Finish the access attempts before assigning additional tasks.

C. Complete FAST before deciding whether to activate blood support.

D. Have the leader personally perform every urgent procedure in sequence.

Answer: A

Why this decision is best: The team must control accessible loss while supporting threatened physiology and mobilizing definitive care. Restoring oversight and named ownership allows simultaneous action.

Analysis of the options

A - Best answer: The team must control accessible loss while supporting threatened physiology and mobilizing definitive care. Restoring oversight and named ownership allows simultaneous action.

B - Inferior in this scenario: Access matters, but it does not justify leaving accessible exsanguinating bleeding uncontrolled.

C - Inferior in this scenario: A bedside scan is not a prerequisite for recognizing this physiological emergency.

D - Inferior in this scenario: Serial personal task execution creates an oversight gap and delays parallel care.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 2 | Team preparation and priority

A 45-year-old with suspected pelvic bleeding improves after emergency blood. Pressure is now 106/64, but each interruption of rapid delivery causes another fall. The receiving nurse calls him stable because the latest measurement is normal. CT is on another floor and transport has arrived. The surgical team has not heard that transfusion requirements are increasing. His hands remain cool and mental state is worsening. The scan would separate the patient from the current rapid transfusion setup unless additional equipment and personnel are arranged. There has been no sustained interval of improvement without active support. The leader is asked to authorize departure based on the latest charted pressure, while the bedside nurse is describing a different trajectory. The decision must reconcile those two accounts. Select the single best next decision under the capabilities and constraints described. What is the most important correction to the shared plan?

A. Proceed to CT because pressure has crossed 100 mm Hg.

B. Describe support-dependent recurrent shock and reassess the route to hemorrhage control before remote CT.

C. Wait for a second hemoglobin before deciding whether shock continues.

D. Increase a pressor solely to preserve the CT appointment.

Answer: B

Why this decision is best: Increasing support and poor perfusion contradict sustained recovery. The team needs an updated physiological synthesis and control decision.

Analysis of the options

A - Inferior in this scenario: An isolated pressure does not establish tolerance of the scanner journey.

B - Best answer: Increasing support and poor perfusion contradict sustained recovery. The team needs an updated physiological synthesis and control decision.

C - Inferior in this scenario: Early hemoglobin cannot reliably arbitrate ongoing loss and should not delay treatment.

D - Inferior in this scenario: Manufacturing a pressure target does not control the lesion or establish adequate flow.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 3 | Team preparation and priority

A 67-year-old falls down stairs. He is confused with pressure 118/70 and pulse 78 while taking a beta blocker. Prehospital staff describe a pressure of 84 systolic before treatment. The handover is interrupted by a request to transfer him onto another trolley. Important medication and response details are lost. A resident proposes a low-acuity pathway based on the current pulse and pressure. The paramedic remains available briefly and can clarify which interventions preceded the improved pressure. Family members are trying to identify the patient's medications. No clinician has yet compared current cognition with baseline. Immediate life threats can be assessed while these details are obtained; the practical problem is preserving decision-relevant information without making resuscitation wait for a perfect history. Select the single best next decision under the capabilities and constraints described. Which process best protects the next decision?

A. Delay all examination until a full written history arrives.

B. Repeat only the current observations and discard prehospital values as unreliable.

C. Accept the initial triage category until CT proves a major injury.

D. Assign someone to capture and confirm the remaining handover while the patient receives immediate reassessment.

Answer: D

Why this decision is best: Prehospital deterioration, treatment response and medication exposure change interpretation. A named recipient preserves information while urgent assessment proceeds.

Analysis of the options

A - Inferior in this scenario: Important history can be gathered in parallel with treatment.

B - Inferior in this scenario: Discarding trajectory removes decision-relevant evidence rather than resolving uncertainty.

C - Inferior in this scenario: Triage labels must change when physiology and risk information warrant it.

D - Best answer: Prehospital deterioration, treatment response and medication exposure change interpretation. A named recipient preserves information while urgent assessment proceeds.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 4 | Team preparation and priority

A 29-year-old requires pleural decompression during resuscitation. The trauma leader performs the procedure, then helps secure the drain. Meanwhile blood availability is delayed, the pelvis remains unassessed and a new pressure of 68/40 is not announced. Nobody has explicitly accepted overall coordination. A junior clinician notices that individual tasks are progressing but the patient's global condition is deteriorating. Several team members believe that someone else has contacted the blood bank, but there is no read-back or completion report. The procedural clinician cannot simultaneously see the monitor and assess every untreated compartment. The remaining team can continue essential interventions if roles are explicitly reassigned. The leader must avoid allowing technical task completion to substitute for whole-patient management. Select the single best next decision under the capabilities and constraints described. What should happen immediately?

A. Stop all procedures for a full formal team debrief.

B. Explicitly transfer or resume overall leadership and announce the deterioration while immediate treatment continues.

C. Assume the most senior person present is already monitoring all tasks.

D. Wait until the drain is completely dressed before changing roles.

Answer: B

Why this decision is best: The oversight gap must be closed explicitly. A brief shared update coordinates urgent parallel treatment without interrupting necessary lifesaving work.

Analysis of the options

A - Inferior in this scenario: A prolonged debrief during collapse can delay treatment.

B - Best answer: The oversight gap must be closed explicitly. A brief shared update coordinates urgent parallel treatment without interrupting necessary lifesaving work.

C - Inferior in this scenario: Seniority does not establish acknowledged responsibility or situational awareness.

D - Inferior in this scenario: Finishing a dressing does not justify leaving severe deterioration unsynthesized.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 5 | Team preparation and priority

A 51-year-old is being assessed after blunt trauma. A junior nurse twice reports new unilateral loss of breath sounds after intubation, but the team continues pelvic stabilization. The leader says the chest was already checked. Oxygenation is falling, and no one has repeated the airway or chest examination. The patient still has a plausible pelvic source of shock, so team members disagree about whether another diagnosis matters. The new observation was made after a procedure that could change tube position or thoracic physiology. Pelvic stabilization remains necessary and can continue with another team member. The concern can be assessed rapidly at the bedside, and the nurse is asking for acknowledgment rather than demanding abandonment of the original diagnosis. The challenge is managing simultaneous threats without fixation. Select the single best next decision under the capabilities and constraints described. Which response best demonstrates appropriate judgment?

A. Keep the original plan because one cause of shock has already been identified.

B. Ask the nurse to document the concern for review after resuscitation.

C. Obtain pelvic CT before revisiting breathing.

D. Acknowledge the new finding and reassess airway and chest immediately while maintaining hemorrhage treatment.

Answer: D

Why this decision is best: A prior survey is time-specific. New respiratory deterioration may represent an additional reversible threat and demands immediate reassessment.

Analysis of the options

A - Inferior in this scenario: A pelvic lesion does not exclude simultaneous airway or pleural pathology.

B - Inferior in this scenario: Documentation is not a substitute for timely clinical response.

C - Inferior in this scenario: The proposed sequence leaves threatened breathing untreated.

D - Best answer: A prior survey is time-specific. New respiratory deterioration may represent an additional reversible threat and demands immediate reassessment.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 6 | Team preparation and priority

A 38-year-old has a penetrating torso wound and persistent hypotension. The abdomen is distended and FAST is clearly positive. The local surgeon and anesthesia team are ready. A trainee requests a complete history, repeat ultrasound and CT before any operative decision because the exact organ injury is unknown. The patient's pressure continues to fall despite blood, and there is no evidence that a competing chest emergency explains the collapse. Blood products are being delivered through reliable access, and anesthesia is preparing the patient for the next intervention. There is no indication that another scan would change the immediate source-control route before further collapse. The patient cannot provide a detailed medication history, but collateral information can follow. The team must decide how much diagnostic certainty this emergency actually requires. Select the single best next decision under the capabilities and constraints described. What is the most defensible next step?

A. Give repeated fluid challenges until pressure becomes normal enough for routine CT.

B. Proceed toward urgent operative control while resuscitation and essential preparation continue.

C. Complete anatomical imaging before making any operative commitment.

D. Wait until all AMPLE elements are available.

Answer: B

Why this decision is best: The established physiological and compartment findings justify urgent control without a complete organ inventory.

Analysis of the options

A - Inferior in this scenario: Continued volume delivery cannot render uncontrolled hemorrhage safe indefinitely.

B - Best answer: The established physiological and compartment findings justify urgent control without a complete organ inventory.

C - Inferior in this scenario: Additional anatomy is useful only if its benefit exceeds the delay in this deteriorating patient.

D - Inferior in this scenario: Missing nonessential history does not override a lifesaving indication.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 7 | Team preparation and priority

A 76-year-old with chest injury repeatedly asks for pain relief. She is breathing shallowly, but oxygenation and circulation are currently acceptable. Staff withhold all analgesia because they want a reliable examination and fear changing her GCS. Her hearing aid was removed and she misunderstands several commands. A consultant interprets her poor responses as neurological deterioration without checking communication or medication conditions. Her responses improve when staff face her and speak clearly. Pain limits coughing and makes it difficult to distinguish unwillingness from inability during movement commands. The team can titrate treatment and document the conditions of each examination. The surgeon needs interpretable serial information, not an untreated patient whose apparent neurological impairment is partly created by the assessment environment. Select the single best next decision under the capabilities and constraints described. Which approach best improves assessment reliability?

A. Record only a total GCS without noting hearing limitations.

B. Provide monitored analgesia and communication support, then document and repeat a focused examination.

C. Withhold analgesia until the entire tertiary survey is finished.

D. Treat misunderstanding as proof of brain injury severity.

Answer: B

Why this decision is best: Pain and communication barriers reduce reliability. Appropriate treatment and explicit documentation improve interpretation without abandoning neurological vigilance.

Analysis of the options

A - Inferior in this scenario: A total without testability conditions conceals important uncertainty.

B - Best answer: Pain and communication barriers reduce reliability. Appropriate treatment and explicit documentation improve interpretation without abandoning neurological vigilance.

C - Inferior in this scenario: Prolonged untreated pain can worsen breathing and examination quality.

D - Inferior in this scenario: A barrier to understanding is a confounder, not an established lesion.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 8 | Team preparation and priority

A 43-year-old needs emergency blood after a motorcycle crash. The team leader asks someone to call the blood bank. Several people hear the request, but nobody responds. Ten minutes later staff discover that no call was made. The patient has recurrent hypotension, and one clinician assumes that the delay means no products are available. The blood bank could have released products immediately if contacted. The blood bank later confirms that no technical barrier prevented release. Several people independently recall hearing the request, yet none understood that they personally owned it. The leader needs a communication method that reveals both successful completion and failure early enough to change care. The problem is accountability within the resuscitation, rather than lack of awareness that transfusion matters. Select the single best next decision under the capabilities and constraints described. Which change most directly prevents recurrence?

A. Direct the request to a named role and require confirmation of contact, availability and any delay.

B. Ask each staff member to make an independent call.

C. Avoid activating blood support until a laboratory score is available.

D. Issue the same unassigned request more loudly.

Answer: A

Why this decision is best: Named ownership and a completion or failure report close the communication loop and reveal resource problems early.

Analysis of the options

A - Best answer: Named ownership and a completion or failure report close the communication loop and reveal resource problems early.

B - Inferior in this scenario: Duplicate uncoordinated calls can add confusion without ensuring accountability.

C - Inferior in this scenario: A score is not required before responding to this clinical bleeding emergency.

D - Inferior in this scenario: Volume does not resolve ambiguity about ownership.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 9 | Team preparation and priority

A 58-year-old develops hypotension while the secondary survey reaches the hands. Earlier airway and chest findings were satisfactory. The resident wants to finish the remaining limb examination because only a few minutes are needed. The nurse reports increasing oxygen requirements and reduced interaction. The trauma surgeon is nearby but has not heard the change. No procedure has been performed in the interval. The earlier reassuring findings were obtained before the oxygen requirement increased. There is no requirement to complete documentation before calling the surgeon, and other staff can preserve the unfinished survey details. A repeat focused assessment could identify a newly reversible problem. The decision concerns whether adherence to the original sequence should survive a meaningful change in patient physiology. Select the single best next decision under the capabilities and constraints described. What is the best next action?

A. Attribute the change to fatigue until the next scheduled observations.

B. Complete the hand examination before returning to vital functions.

C. Interrupt the detailed survey, announce the change and repeat immediate xABCDE assessment.

D. Order a broad laboratory panel and await results before reassessment.

Answer: C

Why this decision is best: Deterioration reopens primary-survey threats regardless of prior findings or proximity to checklist completion.

Analysis of the options

A - Inferior in this scenario: Fatigue is not an adequate explanation without evaluating dangerous causes.

B - Inferior in this scenario: A nearly completed survey does not take priority over new instability.

C - Best answer: Deterioration reopens primary-survey threats regardless of prior findings or proximity to checklist completion.

D - Inferior in this scenario: Laboratory testing can accompany, but cannot replace, immediate bedside reassessment.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 10 | Team preparation and priority

A 26-year-old has severe multisystem injury at a small hospital. The team has controlled an external wound and begun blood support, but definitive pelvic and neurosurgical capabilities are absent. The leader postpones referral until all imaging and consultations are complete. The patient currently tolerates treatment but has already shown one episode of recurrent hypotension. Transport availability becomes more limited later in the evening. The referral process can start without committing to immediate departure, and the receiving team can help clarify what local treatment is necessary. Waiting for complete certainty may leave fewer transport options if another episode of shock occurs. The patient still needs close reassessment and essential stabilization. The leader must separate early coordination from the later judgment that the journey is tolerable. Select the single best next decision under the capabilities and constraints described. Which planning choice is most appropriate?

A. Wait for diagnostic certainty before any referral contact.

B. Transfer immediately without assessing support or required local treatment.

C. Begin receiving-center and transport coordination now while necessary local stabilization continues.

D. Keep the patient locally until all physiological values normalize.

Answer: C

Why this decision is best: Early coordination creates options without preventing necessary local lifesaving care. Readiness and timing remain clinical decisions.

Analysis of the options

A - Inferior in this scenario: Waiting until certainty or collapse can remove a viable rescue route.

B - Inferior in this scenario: Referral urgency does not eliminate airway, circulation or transport requirements.

C - Best answer: Early coordination creates options without preventing necessary local lifesaving care. Readiness and timing remain clinical decisions.

D - Inferior in this scenario: Definitive treatment may be necessary to correct the physiology; normalization is not always achievable locally.

Review: teaching domain 1; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 11 | Airway and cervical protection

A 41-year-old has facial bleeding and pressure 80/48 after a collision. He is agitated, repeatedly removes oxygen and cannot clear blood from his mouth. Two suction devices and emergency blood are available. The airway clinician anticipates difficult laryngoscopy and profound peri-induction hypotension. A trainee proposes giving a standard induction dose immediately because the oxygen saturation is still 96%, with airway rescue equipment to be located afterward. The suction devices have been checked, and a second experienced clinician can support the attempt or take over if needed. Continued bleeding means that even a technically successful intubation could be followed by circulatory collapse. The team must define both an oxygenation rescue and a hemodynamic plan, rather than treat airway anatomy and blood loss as unrelated sequential problems. Select the single best next decision under the capabilities and constraints described. What preparation best addresses the combined risks?

A. Give a large crystalloid load as the sole prerequisite for intubation.

B. Prepare suction, oxygenation, a difficult-airway rescue plan and concurrent blood support before a coordinated urgent attempt.

C. Induce immediately and address failed oxygenation only if it occurs.

D. Delay every airway intervention until pressure is completely normal.

Answer: B

Why this decision is best: Anatomical contamination and physiological collapse risks coexist. Preparation must address both without an indefinite delay in a threatened airway.

Analysis of the options

A - Inferior in this scenario: Crystalloid alone does not correct ongoing hemorrhage or replace tailored preparation.

B - Best answer: Anatomical contamination and physiological collapse risks coexist. Preparation must address both without an indefinite delay in a threatened airway.

C - Inferior in this scenario: Unprepared rescue increases the consequences of a failed first attempt.

D - Inferior in this scenario: A threatened airway may not permit waiting for complete normalization.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 12 | Airway and cervical protection

A 32-year-old is intubated after blunt trauma. Sustained capnography confirms tracheal placement. Minutes later oxygenation falls, left air entry is reduced and pressure declines. The tube mark is deeper than initially documented after a transfer. There is no obvious chest wound. The operator says tracheal confirmation excludes an airway explanation and requests immediate bilateral chest drains without checking depth, ventilation or the circuit. The waveform remains present but the delivered volumes have changed, and the patient has just been moved between surfaces. The team can rapidly inspect the circuit and tube while another clinician reassesses the pleural spaces. If a convincing tension emergency is found, treatment need not await formal imaging. The challenge is acting quickly without confusing one confirmation sign with complete airway safety. Select the single best next decision under the capabilities and constraints described. Which assessment should occur immediately?

A. Wait for formal CT to separate all possible causes.

B. Reassess tube depth and function, circuit and both chest sides while treating any clinically convincing tension emergency.

C. Assume all unilateral findings represent tension because the tube is tracheal.

D. Remove the tube solely because saturation has fallen.

Answer: B

Why this decision is best: Capnography confirms tracheal ventilation, not optimal depth or absence of simultaneous pleural disease. Rapid structured reassessment guides urgent treatment.

Analysis of the options

A - Inferior in this scenario: CT delays evaluation of potentially reversible bedside problems.

B - Best answer: Capnography confirms tracheal ventilation, not optimal depth or absence of simultaneous pleural disease. Rapid structured reassessment guides urgent treatment.

C - Inferior in this scenario: Mainstem positioning and other causes remain plausible.

D - Inferior in this scenario: Reflex removal may sacrifice a secured airway without identifying the cause.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 13 | Airway and cervical protection

A 55-year-old with a cervical injury needs intubation for deteriorating ventilation. A rigid collar restricts mouth opening. The experienced airway clinician requests removal of its anterior portion while an assistant maintains appropriate support and movement minimization. Another clinician refuses because any collar adjustment is believed to worsen cord injury. Oxygenation is becoming harder to maintain, and a compatible rescue plan is ready. An assistant is ready to maintain alignment and the operator has a primary and rescue plan. No one is proposing a diagnostic maneuver or elective neck movement. The device that normally helps restrict motion is now limiting access to a failing airway. The team must preserve the purpose of protection while avoiding a rigid application that prevents necessary lifesaving treatment. Select the single best next decision under the capabilities and constraints described. Which choice best balances the threats?

A. Remove all protection and use unrestricted neck extension.

B. Permit necessary collar adjustment with coordinated cervical support to facilitate safe airway management.

C. Delay airway care until cervical imaging clears the neck.

D. Maintain the collar unchanged even if access becomes impossible.

Answer: B

Why this decision is best: Airway treatment must remain feasible while minimizing avoidable movement. Collar use should not create an untreated oxygenation emergency.

Analysis of the options

A - Inferior in this scenario: Necessary access does not justify abandoning movement precautions.

B - Best answer: Airway treatment must remain feasible while minimizing avoidable movement. Collar use should not create an untreated oxygenation emergency.

C - Inferior in this scenario: Imaging clearance is not a prerequisite for lifesaving airway support.

D - Inferior in this scenario: An obstructive device cannot take priority over a failing airway.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 14 | Airway and cervical protection

A 24-year-old has a GCS of 14 but progressive neck swelling after penetrating injury, a changed voice and increasing difficulty handling secretions. Saturation is 97% with oxygen. The patient is currently cooperative, and the team has skilled airway support available. A resident suggests CT first because the GCS does not meet a numerical intubation threshold. Transport would take the patient away from immediate rescue capability. The swelling has progressed during the observation period, and the patient is finding it harder to lie comfortably. The scanner cannot provide the same immediate airway access as the resuscitation room. A controlled intervention is currently more feasible than it may become after further anatomical distortion. The decision must account for foreseeable deterioration rather than only present oxygen saturation. Select the single best next decision under the capabilities and constraints described. What is the best interpretation?

A. CT should always precede airway intervention in a speaking patient.

B. Normal saturation proves the swelling cannot obstruct the airway soon.

C. A threatened future airway may justify controlled early management despite a relatively high GCS.

D. A GCS above 8 reliably excludes a need for airway intervention.

Answer: C

Why this decision is best: Trajectory, secretion handling and evolving anatomy predict airway loss independently of the total GCS.

Analysis of the options

A - Inferior in this scenario: Speaking now does not establish safety during transport or further swelling.

B - Inferior in this scenario: Saturation can remain satisfactory before sudden obstruction.

C - Best answer: Trajectory, secretion handling and evolving anatomy predict airway loss independently of the total GCS.

D - Inferior in this scenario: The score is one warning signal, not the sole indication.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 15 | Airway and cervical protection

A 63-year-old with hemorrhagic shock is oxygenated by a face mask while blood arrives. He needs urgent intubation for worsening consciousness. The anesthetist plans a modified approach accounting for reduced reserve and has a temporary pressor ready for severe peri-induction hypotension. A surgeon objects that pressors are never acceptable in any bleeding patient and insists that induction must wait until hemorrhage is definitively stopped. The airway cannot safely remain unprotected much longer, but the patient also cannot tolerate an unprepared induction. Blood delivery and surgical activation are continuing rather than being replaced by medication. The proposed vasoactive support is a monitored temporary adjunct, not a strategy for normalizing every number. The question is whether an absolute rule improves or worsens this specific rescue situation. Select the single best next decision under the capabilities and constraints described. Which position is most appropriate?

A. Prohibit any temporary vasoactive support regardless of the circumstances.

B. Postpone airway protection indefinitely until the operation is completed.

C. Use carefully selected adjunctive support for the urgent airway while continuing blood and source-control treatment.

D. Use a pressor instead of blood because it acts faster.

Answer: C

Why this decision is best: Selected temporary hemodynamic support can accompany urgent airway care; it does not replace volume restoration or control.

Analysis of the options

A - Inferior in this scenario: An absolute prohibition ignores the peri-intubation physiological emergency.

B - Inferior in this scenario: The patient may not safely wait for completion of definitive hemorrhage care.

C - Best answer: Selected temporary hemodynamic support can accompany urgent airway care; it does not replace volume restoration or control.

D - Inferior in this scenario: A pressure response alone does not restore oxygen-carrying volume or stop loss.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 16 | Airway and cervical protection

A 36-year-old undergoes several unsuccessful intubation attempts. Each attempt provides a worse view as bleeding and edema increase. Oxygen saturation is now falling despite attempted ventilation. The same operator requests another identical attempt because the cords were briefly visible earlier. A trained airway-rescue clinician and emergency front-of-neck equipment are immediately available. The leader must determine whether persistence is helping or delaying oxygenation. The available oxygenation reserve has been consumed by repeated attempts, and the airway is becoming more difficult rather than easier. The rescue clinician is asking for an explicit declaration so that the next step is coordinated. A brief earlier view does not guarantee that another identical attempt will succeed. The team must recognize when persistence has become a source of delay. Select the single best next decision under the capabilities and constraints described. What is the best next decision?

A. Continue attempts without calling the available rescue clinician.

B. Wait for radiology to identify the obstruction.

C. Repeat the same attempt until the tube passes.

D. Declare failed oxygenation and move promptly through the trained rescue pathway rather than repeat an ineffective attempt.

Answer: D

Why this decision is best: The priority is oxygenation and timely rescue. Repeating a failing strategy can worsen injury and consume remaining reserve.

Analysis of the options

A - Inferior in this scenario: Available expertise should be activated before further avoidable delay.

B - Inferior in this scenario: Imaging is not the next step in a failed-oxygenation emergency.

C - Inferior in this scenario: Persistence is harmful when it ignores deterioration and alternative rescue.

D - Best answer: The priority is oxygenation and timely rescue. Repeating a failing strategy can worsen injury and consume remaining reserve.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 17 | Airway and cervical protection

A 47-year-old is ventilated after a difficult emergency airway. Saturation is acceptable on high oxygen, but there is no sustained exhaled-carbon-dioxide waveform. Staff report that the tube passed under limited visualization. The patient is not in cardiac arrest and has a palpable pulse. The operator attributes the finding to the trauma and begins securing the tube for transfer, without checking the device or ventilation system. The saturation may reflect prior oxygen administration and can remain deceptively acceptable for a short interval. Equipment failure is possible, but it has not been demonstrated. The team must resolve the contradiction between the claimed procedural success and missing objective confirmation before moving the patient. A secured tube is only useful if it actually provides effective tracheal ventilation. Select the single best next decision under the capabilities and constraints described. What should the team do now?

A. Wait for a delayed radiograph while continuing the same assumption.

B. Document successful intubation solely from the operator's impression.

C. Urgently reassess placement and ventilation using the airway confirmation/rescue pathway before transfer.

D. Accept saturation as definitive proof of tracheal placement.

Answer: C

Why this decision is best: The missing sustained waveform in this context is a major warning requiring immediate assessment of placement, delivery and equipment.

Analysis of the options

A - Inferior in this scenario: A delayed film should not postpone resolving possible failed airway placement.

B - Inferior in this scenario: Visual impression under difficult conditions is insufficient when objective confirmation is absent.

C - Best answer: The missing sustained waveform in this context is a major warning requiring immediate assessment of placement, delivery and equipment.

D - Inferior in this scenario: High inspired oxygen can temporarily mask inadequate ventilation.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 18 | Airway and cervical protection

A 70-year-old becomes hypotensive immediately after intubation. Blood pressure had already been falling before induction, and rapid transfusion continues. Bilateral air entry and capnography are present, but airway pressure is higher than expected. A resident attributes the entire collapse to the induction drug. Another requests immediate abdominal CT to look for bleeding. The trauma leader notes that several mechanisms could have worsened at once. The patient may have lost compensatory sympathetic tone during induction, but the new ventilatory conditions could also worsen venous return. Ongoing hemorrhage has not yet been definitively controlled. Bedside reassessment can occur while blood continues. The surgeon must avoid choosing a convenient single explanation solely from the timing of the collapse and must look for rapidly correctable contributors. Select the single best next decision under the capabilities and constraints described. Which action best addresses the uncertainty?

A. Perform rapid airway/ventilation and chest reassessment while continuing hemorrhage evaluation and resuscitation.

B. Assume the timing proves a drug-only cause.

C. Proceed directly to remote CT without checking reversible mechanical causes.

D. Give repeated pressor boluses and defer bedside reassessment.

Answer: A

Why this decision is best: Drug effects, hemorrhage and ventilation-related obstruction can coexist. Timing should guide, not terminate, the differential.

Analysis of the options

A - Best answer: Drug effects, hemorrhage and ventilation-related obstruction can coexist. Timing should guide, not terminate, the differential.

B - Inferior in this scenario: Temporal association does not exclude a simultaneous treatable lesion.

C - Inferior in this scenario: Bedside threats should be assessed before an unsafe diagnostic journey.

D - Inferior in this scenario: Support without diagnosing correctable causes may conceal worsening shock.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 19 | Airway and cervical protection

A 30-year-old with a contaminated airway initially improves after intubation. During movement to CT the capnogram becomes abnormal, ventilation is difficult and saturation falls. A suction catheter cannot pass through the tube. The tube remains taped at the recorded depth, and the chest was normal several minutes earlier. The transport clinician proposes increasing ventilator pressure and completing CT because traumatic brain injury is also suspected. The transport route has limited space for a repeat airway procedure, and completion of CT would delay intervention further. The clinician can stop movement and summon immediate assistance. A functioning airway cannot be inferred from tape security or the original procedural note. The decision must protect oxygen delivery before pursuing the anatomical information that the scan is intended to provide. Select the single best next decision under the capabilities and constraints described. What is the best priority?

A. Defer airway reassessment until the brain images are obtained.

B. Increase pressure until the obstruction is overcome and continue scanning.

C. Assume unchanged tube depth excludes a tube problem.

D. Stop transport and urgently assess obstruction or device failure through the airway rescue pathway.

Answer: D

Why this decision is best: A nonpassing catheter and difficult ventilation raise concern for obstruction. Oxygenation takes precedence over completing imaging.

Analysis of the options

A - Inferior in this scenario: Brain injury increases the need to prevent hypoxemia, not tolerate it.

B - Inferior in this scenario: Higher pressure may add harm without relieving an obstructed device.

C - Inferior in this scenario: Depth does not establish luminal patency or function.

D - Best answer: A nonpassing catheter and difficult ventilation raise concern for obstruction. Oxygenation takes precedence over completing imaging.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 20 | Airway and cervical protection

A 48-year-old is intubated with neuromuscular blockade and transferred before any repeat examination. At the receiving center he has no movement and an untestable verbal response. The referral note contains a predrug description of command-following with all limbs, but no total GCS. A clinician assigns a measured GCS of 3 and uses it to downgrade the perceived value of aggressive hemorrhage treatment. The referring team can supply exact drug times and the earlier motor observations. There is no evidence that the current absence of movement began before medication. The receiving surgeon still needs to identify and treat reversible threats. The key interpretive issue is whether a numerical total can be compared across conditions in which several components were never actually testable. Select the single best next decision under the capabilities and constraints described. What is the most appropriate correction?

A. Infer that the predrug description is unusable without a total score.

B. Treat all absent responses as new brainstem failure.

C. Record current testability and drugs, preserve the predrug examination and avoid prognostic conclusions from paralysis.

D. Stop resuscitation because the current total appears very low.

Answer: C

Why this decision is best: The examination is pharmacologically confounded. Component findings and their conditions are more useful than an invented comparable total.

Analysis of the options

A - Inferior in this scenario: A reliable descriptive baseline remains valuable.

B - Inferior in this scenario: Paralysis and sedation can abolish responses without establishing new structural injury.

C - Best answer: The examination is pharmacologically confounded. Component findings and their conditions are more useful than an invented comparable total.

D - Inferior in this scenario: Treatment limitation cannot be justified by this confounded score alone.

Review: teaching domain 2; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 21 | Breathing and chest threats

A 27-year-old with chest trauma develops rapidly worsening ventilation, unilateral absent air entry and profound hypotension. He is receiving positive-pressure ventilation. The ultrasound machine is being used on another patient and the radiographer estimates ten minutes. Neck veins are not distended, and a resident argues that this makes tension unlikely. The trained procedural clinician has decompression equipment ready while blood support continues. The patient's deterioration followed a change to positive-pressure ventilation, and waiting for a full set of classic signs would add delay. A different team member can continue access and blood delivery. The intervention must be followed by assessment of physiological benefit and effective drainage. The clinician must decide whether immediate mechanical rescue is justified before another diagnostic study becomes available. Select the single best next decision under the capabilities and constraints described. What is the best next action?

A. Wait for neck-vein distension before intervention.

B. Increase inspired oxygen alone while awaiting radiography.

C. Obtain CT because ultrasound is unavailable.

D. Treat the clinically convincing tension emergency promptly without waiting for imaging.

Answer: D

Why this decision is best: Compatible respiratory and circulatory collapse warrants immediate mechanical treatment. Hypovolemia may obscure classic signs.

Analysis of the options

A - Inferior in this scenario: Absence of a classic sign does not exclude tension physiology.

B - Inferior in this scenario: Oxygen does not relieve obstructed venous return or trapped pleural pressure.

C - Inferior in this scenario: Remote imaging delays treatment of a potentially immediately reversible cause.

D - Best answer: Compatible respiratory and circulatory collapse warrants immediate mechanical treatment. Hypovolemia may obscure classic signs.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 22 | Breathing and chest threats

A 39-year-old briefly improves after needle decompression, then deteriorates again with recurrent unilateral quietness and hypotension. Positive-pressure ventilation continues. The first intervention produced an audible release, and the operator considers the diagnosis resolved. Staff suggest giving more blood alone because the pleural emergency has already been treated. A trained clinician can perform definitive pleural management immediately at the bedside. The patient remains exposed to the same ventilation-related pressure stress that existed before the first maneuver. A release of air earlier is evidence about that moment, not proof that the pleural space remains decompressed. The team can verify patency and establish a more durable solution. Failure to improve should also trigger a search for an additional untreated cause of shock. Select the single best next decision under the capabilities and constraints described. Which response is best?

A. Reassess decompression effectiveness and establish effective durable pleural drainage through the trained pathway.

B. Assume the initial release proves continuing decompression.

C. Repeat identical needle attempts without reassessing function or alternatives.

D. Send the patient to CT before checking the treated side.

Answer: A

Why this decision is best: A temporizing maneuver can fail or cease to function. Recurrent compatible physiology requires verification and effective drainage.

Analysis of the options

A - Best answer: A temporizing maneuver can fail or cease to function. Recurrent compatible physiology requires verification and effective drainage.

B - Inferior in this scenario: An initial response is not a guarantee of continuing patency.

C - Inferior in this scenario: Repeated ineffective maneuvers can delay definitive relief.

D - Inferior in this scenario: The bedside mechanical problem should be addressed before transport.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 23 | Breathing and chest threats

A 33-year-old has an open chest wound after assault. A dressing is applied and breathing briefly improves. During transfer preparation distress and hypotension worsen, with reduced breath sounds on that side. The dressing is tightly sealed. The receiving clinician requests that nobody disturb it because a closed wound looks safer. Skilled pleural intervention and drainage are available locally, and the airway remains patent. The dressing was intended to help control the open defect, but its current effect must be judged from physiology rather than appearance. The team can assess the wound and pleural function without waiting for transport. Bleeding and other shock mechanisms still require consideration. The immediate task is to recognize whether a useful initial measure has created or failed to prevent a new mechanical threat. Select the single best next decision under the capabilities and constraints described. What should happen immediately?

A. Preserve the seal unchanged until arrival at the specialist center.

B. Treat the deterioration solely with analgesia.

C. Add more occlusive layers without reassessment.

D. Reassess for trapped pleural pressure, address the dressing and provide indicated pleural treatment with monitoring.

Answer: D

Why this decision is best: An occlusive dressing can trap air; worsening physiology requires reassessment and relief through the appropriate pathway.

Analysis of the options

A - Inferior in this scenario: Appearance does not override new tension-compatible physiology.

B - Inferior in this scenario: Analgesia cannot correct the mechanical circulatory threat.

C - Inferior in this scenario: More occlusion can worsen trapping.

D - Best answer: An occlusive dressing can trap air; worsening physiology requires reassessment and relief through the appropriate pathway.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 24 | Breathing and chest threats

A 58-year-old has a large traumatic hemothorax. The chest tube drains only 250 mL, but ultrasound and radiography still show a substantial collection. Pressure remains 78/46 despite blood, and the tubing contains visible clot. A resident recommends observation because the initial drainage did not reach a customary operative threshold. The operating team is available, and no alternative bleeding source clearly explains the persistent shock. The remaining collection could contain blood that never reached the measuring chamber. The patient has not developed a durable response to resuscitation, and the drainage system's performance is questionable. A numeric threshold is being considered as if it were an exclusion rule. The decision needs to integrate retained volume, mechanism, ongoing support and the availability of effective thoracic control. Select the single best next decision under the capabilities and constraints described. Which interpretation should guide the decision?

A. Drain output may underestimate retained blood; persistent shock and the full picture require urgent control assessment.

B. Low measured output excludes major thoracic blood loss.

C. Wait several hours to satisfy a drainage-rate criterion.

D. Remove the drain blindly to improve measurement.

Answer: A

Why this decision is best: Clot or ineffective drainage can conceal loss. Numerical output guides cannot override refractory physiology and retained collection.

Analysis of the options

A - Best answer: Clot or ineffective drainage can conceal loss. Numerical output guides cannot override refractory physiology and retained collection.

B - Inferior in this scenario: The measurement may reflect drainage failure rather than limited bleeding.

C - Inferior in this scenario: Waiting for a threshold can delay necessary treatment.

D - Inferior in this scenario: Unplanned removal may add harm and does not establish source control.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 25 | Breathing and chest threats

A 46-year-old with flail-segment rib fractures is alert and hemodynamically stable. Pain causes shallow breathing and a weak cough, but gas exchange improves with oxygen and careful analgesia. He can protect his airway and cooperate. The resident proposes mandatory intubation because a flail segment is visible. The team can monitor closely and has escalation and regional analgesia expertise available. The patient has improved cough effort after treatment and no current loss of protective function. However, pulmonary injury may evolve and the team cannot assume that current success will persist. A monitored setting and explicit escalation criteria are available. The question is whether the anatomical label alone should determine an invasive intervention, rather than current respiratory function and likely trajectory. Select the single best next decision under the capabilities and constraints described. Which plan is most appropriate?

A. Intubate solely because paradoxical movement is present.

B. Base respiratory support on function and trajectory, optimize analgesia and monitor with clear escalation triggers.

C. Discharge because blood pressure is normal.

D. Withhold analgesia to preserve respiratory drive.

Answer: B

Why this decision is best: Anatomy informs risk but does not alone mandate ventilation. Functional failure, support needs and monitoring capability determine escalation.

Analysis of the options

A - Inferior in this scenario: Automatic intubation ignores current function and potential treatment response.

B - Best answer: Anatomy informs risk but does not alone mandate ventilation. Functional failure, support needs and monitoring capability determine escalation.

C - Inferior in this scenario: Stable circulation does not establish safe respiratory discharge.

D - Inferior in this scenario: Pain can worsen ventilation and secretion clearance.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 26 | Breathing and chest threats

A 62-year-old develops worsening oxygenation six hours after blunt chest trauma. Initial radiography was modestly abnormal, and pleural drainage is patent. He has increasing work of breathing and new diffuse parenchymal opacities. A clinician dismisses progression because the admission film did not show extensive injury. Another proposes a large fluid bolus despite no evidence of hypoperfusion. The patient is tiring but still responsive. The clinician must distinguish evolving parenchymal dysfunction from a blocked drain, airway problem or additional injury. The early image is still relevant, but it does not describe the entire later course. Support requirements and fatigue now provide new evidence. The team should choose treatment from present physiology while avoiding interventions that add fluid burden without a demonstrated circulatory indication. Select the single best next decision under the capabilities and constraints described. Which approach best reflects the evolving injury?

A. Reassess respiratory failure and other reversible causes, provide escalating support and avoid unnecessary fluid loading.

B. Give fluid until the radiograph clears.

C. Wait for a scheduled morning review despite fatigue.

D. Use the initial image to exclude important pulmonary injury.

Answer: A

Why this decision is best: Parenchymal injury can evolve. Current function and trajectory should guide support while alternative problems are reconsidered.

Analysis of the options

A - Best answer: Parenchymal injury can evolve. Current function and trajectory should guide support while alternative problems are reconsidered.

B - Inferior in this scenario: Excess fluid can worsen lung dysfunction and does not clear contusion.

C - Inferior in this scenario: Fatigue and rising support needs require timely escalation.

D - Inferior in this scenario: Early imaging does not freeze the injury state.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 27 | Breathing and chest threats

A 35-year-old has persistent major air leakage after a chest tube and continued difficulty ventilating. The drain connections are checked and intact, yet the lung does not re-expand appropriately. Blood pressure is supportable. A trainee suggests clamping the tube to stop the visible bubbling, then proceeding with routine abdominal imaging. The thoracic specialist can be contacted and bronchoscopy is available through the appropriate team. The bubbling is a sign requiring interpretation rather than a nuisance to suppress. Ventilation can be maintained temporarily, allowing focused specialist assessment without a routine imaging detour. The team needs to distinguish equipment leakage from an anatomical source and anticipate deterioration. The goal is effective drainage and definitive evaluation, not a visually quiet collection chamber at the expense of safety. Select the single best next decision under the capabilities and constraints described. What is the best next judgment?

A. Suspect major airway injury or another persistent leak source and seek urgent specialist evaluation without routine clamping.

B. Assume persistent bubbling proves the problem is completely treated.

C. Remove the tube because the lung remains incompletely expanded.

D. Clamp the tube to make the collection system quiet.

Answer: A

Why this decision is best: A large continuing leak despite a functioning system raises concern for significant injury requiring targeted evaluation.

Analysis of the options

A - Best answer: A large continuing leak despite a functioning system raises concern for significant injury requiring targeted evaluation.

B - Inferior in this scenario: A drain can temporize physiology while a major lesion persists.

C - Inferior in this scenario: Reflex removal can lose control of pleural air.

D - Inferior in this scenario: Clamping an actively leaking pneumothorax can recreate tension.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 28 | Breathing and chest threats

A 40-year-old has a penetrating precordial wound, hypotension and a small pericardial collection on focused ultrasound. His neck veins are flat after blood loss. A resident discounts tamponade because the classic clinical triad is incomplete. Another proposes formal CT before notifying the surgeon. The patient becomes less responsive while the bedside team has immediate operative rescue capability available. The focused cardiac finding is not a complete anatomical diagnosis, but it changes the urgency in this mechanism and trajectory. Blood loss can alter the expected physical signs. Additional information is helpful only if it does not postpone the necessary rescue. The surgeon must decide how much evidence is sufficient to activate definitive cardiac injury management in a rapidly deteriorating patient. Select the single best next decision under the capabilities and constraints described. Which plan is most defensible?

A. Escalate urgent traumatic cardiac injury/control assessment while supporting physiology, without waiting for classic signs or routine CT.

B. Exclude tamponade because neck veins are flat.

C. Observe until the pericardial collection becomes larger.

D. Use a normal chest radiograph to defer cardiac assessment.

Answer: A

Why this decision is best: Traumatic cardiac injury and tamponade may lack classic findings, particularly with blood loss. Deterioration demands urgent expert control.

Analysis of the options

A - Best answer: Traumatic cardiac injury and tamponade may lack classic findings, particularly with blood loss. Deterioration demands urgent expert control.

B - Inferior in this scenario: Hypovolemia can mask venous distension.

C - Inferior in this scenario: Small volume may still be important; physiology determines urgency.

D - Inferior in this scenario: Plain radiography cannot exclude the relevant cardiac emergency.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 29 | Breathing and chest threats

A 50-year-old survives a high-speed deceleration injury and remains stable after initial resuscitation. He has upper chest bruising, a scapular fracture and persistent interscapular pain. The portable chest film has no striking mediastinal abnormality. A resident wants to omit vascular imaging because the film looks reassuring. Appropriate CT angiography can be performed without leaving the resuscitation area, with monitoring maintained. A diagnosis before collapse could permit coordinated specialist treatment, whereas waiting for hypotension would make both imaging and intervention more difficult. The plain film answers only part of the thoracic assessment. The patient is currently able to tolerate an appropriate vascular study with support maintained. The question tests when mechanism and associated findings justify further evaluation despite an initially reassuring adjunct. Select the single best next decision under the capabilities and constraints described. What is the best decision?

A. Perform immediate thoracotomy solely from the mechanism.

B. Exclude aortic injury from the chest radiograph alone.

C. Use injury-directed vascular imaging when clinical suspicion warrants it despite the reassuring plain film.

D. Delay all further evaluation until hypotension develops.

Answer: C

Why this decision is best: Mechanism and associated findings can justify angiographic assessment in a supportable patient; a normal film is not an exclusion test.

Analysis of the options

A - Inferior in this scenario: Mechanism raises suspicion rather than proving an operative lesion.

B - Inferior in this scenario: Plain-film sensitivity is insufficient for this inference.

C - Best answer: Mechanism and associated findings can justify angiographic assessment in a supportable patient; a normal film is not an exclusion test.

D - Inferior in this scenario: Waiting for collapse forfeits an opportunity for diagnosis and planned treatment.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 30 | Breathing and chest threats

A 68-year-old has rib fractures and increasing respiratory support needs. He is intermittently vomiting, confused and unable to clear secretions. A clinician proposes noninvasive ventilation to avoid intubation because the blood pressure is currently acceptable. The patient repeatedly removes the mask and has declining interaction. Skilled airway management is available, and the team can continue simultaneous evaluation of chest and circulation. The mask has not provided a durable improvement, and staff cannot reliably protect against aspiration while forcing cooperation. A controlled airway intervention is more feasible now than after exhaustion. The team must address analgesia and chest pathology in parallel, but cannot allow the desire to avoid an invasive procedure to prolong a failing or unsuitable mode of support. Select the single best next decision under the capabilities and constraints described. Which approach is best?

A. Wait for profound desaturation before reconsidering support.

B. Persist with NIV because it is less invasive in every chest injury.

C. Reassess airway protection and respiratory failure, with controlled invasive support when indicated rather than persisting with unsuitable NIV.

D. Sedate deeply to force mask tolerance without an airway plan.

Answer: C

Why this decision is best: Vomiting, poor cooperation and loss of protective function can make NIV unsafe. Escalation depends on the whole trajectory.

Analysis of the options

A - Inferior in this scenario: Waiting for extreme hypoxemia increases procedural risk.

B - Inferior in this scenario: Less invasive is not synonymous with safer in this setting.

C - Best answer: Vomiting, poor cooperation and loss of protective function can make NIV unsafe. Escalation depends on the whole trajectory.

D - Inferior in this scenario: Sedation can further impair protection and precipitate failure.

Review: teaching domain 3; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 31 | Circulation and hemorrhage

A 42-year-old with pelvic trauma has pressure 88/54 and cool hands. FAST is negative and early hemoglobin is 13.4 g/dL. He initially improves with blood but deteriorates again. The binder lies over the abdomen rather than the greater trochanters. CT is remote and embolization will be delayed. A resident argues that the normal hemoglobin excludes major loss and requests a fluid bolus followed by imaging. The team can correct the binder and activate control while another clinician continues airway and chest assessment. There is no need to explain every milliliter of loss before acting on the trajectory. The negative focused scan is being used to exclude a compartment it does not adequately assess. The key question is whether apparent laboratory reassurance outweighs evidence of unresolved hypoperfusion. Select the single best next decision under the capabilities and constraints described. What is the best immediate strategy?

A. Wait for hemoglobin to fall before activating hemorrhage resources.

B. Proceed to remote CT because FAST is negative.

C. Tighten the misplaced binder further without reassessing position.

D. Correct indicated pelvic stabilization, continue blood support and mobilize timely source control while reassessing other compartments.

Answer: D

Why this decision is best: The trajectory indicates ongoing shock; neither early hemoglobin nor FAST excludes pelvic/retroperitoneal loss. Stabilization and control must progress together.

Analysis of the options

A - Inferior in this scenario: Laboratory equilibration should not determine the timing of lifesaving activation.

B - Inferior in this scenario: Negative FAST does not establish transport safety or exclude pelvic bleeding.

C - Inferior in this scenario: Incorrect position must be corrected rather than compensated for by force.

D - Best answer: The trajectory indicates ongoing shock; neither early hemoglobin nor FAST excludes pelvic/retroperitoneal loss. Stabilization and control must progress together.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 32 | Circulation and hemorrhage

A 23-year-old with a deep limb wound remains hypotensive despite blood. The dressing looks dry externally, but blood is pooling beneath the patient. A clinician wants central access before any further treatment; two working large peripheral lines are already present. The tourniquet kit and trained staff are nearby. The surgeon is awaiting a call because the team assumes external loss was controlled before arrival. Inspection and control can be performed immediately without sacrificing working access or stopping blood delivery. The apparent success of a prehospital dressing must be verified rather than inherited as fact. The patient's continuing physiological deficit could reflect more than one source, but the accessible loss is already actionable. The team must not let a procedural preference delay an obvious treatment opportunity. Select the single best next decision under the capabilities and constraints described. Which action has the greatest immediate value?

A. Insert a central line before inspecting the wound.

B. Give additional blood without checking accessible loss.

C. Assume a dry outer dressing establishes hemostasis.

D. Expose and confirm effective external hemorrhage control while activating definitive treatment and continuing existing access support.

Answer: D

Why this decision is best: A treatable continuing source is evident. Reliable existing access allows resuscitation while mechanical control and definitive help are arranged.

Analysis of the options

A - Inferior in this scenario: Central access should not delay control when adequate access already exists.

B - Inferior in this scenario: Support alone cannot compensate indefinitely for uncontrolled external loss.

C - Inferior in this scenario: A dressing can conceal bleeding beneath it.

D - Best answer: A treatable continuing source is evident. Reliable existing access allows resuscitation while mechanical control and definitive help are arranged.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 33 | Circulation and hemorrhage

A 64-year-old after a collision has pressure 102/62, pulse 74 and lactate 6.1 mmol/L. She takes a beta blocker and normally has systolic pressure near 170. She is confused with delayed refill. There is no obvious external loss. The resident labels the lactate nonspecific and proposes routine ward assessment because neither tachycardia nor absolute severe hypotension is present. Imaging and blood resources are available. The lactate does not prove a particular mechanism, and alternative causes remain possible. Nevertheless, the combination of baseline pressure difference, cool peripheries and new confusion requires active evaluation. The patient has not demonstrated normal end-organ function. The surgeon must decide whether absent textbook tachycardia is enough to override several independent signs that circulating support may be inadequate. Select the single best next decision under the capabilities and constraints described. Which interpretation should guide care?

A. Use the current systolic pressure as proof of normal perfusion.

B. Treat the integrated findings as possible occult hypoperfusion and urgently evaluate hemorrhage and competing causes.

C. Exclude shock because the pulse is below 100.

D. Wait for lactate normalization before investigating its cause.

Answer: B

Why this decision is best: Baseline pressure, medication effects and end-organ findings make occult shock plausible. Lactate adds evidence but does not define the source.

Analysis of the options

A - Inferior in this scenario: A numerical pressure does not establish adequate flow in this context.

B - Best answer: Baseline pressure, medication effects and end-organ findings make occult shock plausible. Lactate adds evidence but does not define the source.

C - Inferior in this scenario: Beta blockade can blunt tachycardia.

D - Inferior in this scenario: The cause must be addressed rather than awaiting spontaneous metabolic recovery.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 34 | Circulation and hemorrhage

A 37-year-old is receiving a major transfusion for abdominal bleeding. Temperature falls to 34.1 C, ionized calcium is low and clot formation is deteriorating. The operating team is obtaining control. A trainee suggests postponing surgery until all laboratory abnormalities normalize. Another proposes treating the calcium but ignoring warming because blood delivery is the only immediate priority. The patient still requires substantial support. The abnormalities can worsen bleeding and each other, while continued bleeding makes them harder to correct. The surgical and resuscitation teams can act simultaneously rather than wait for one task to finish. Serial results should guide treatment, but the goal is restored physiology through control and appropriate support. A laboratory endpoint cannot be treated as an isolated prerequisite for lifesaving action. Select the single best next decision under the capabilities and constraints described. Which plan best integrates these problems?

A. Treat calcium alone and reassess all other deficits after surgery.

B. Give escalating crystalloid to correct every abnormal number.

C. Stop control efforts until temperature and coagulation fully normalize.

D. Continue source control with concurrent warming and protocol-directed correction of hemostatic and metabolic deficits.

Answer: D

Why this decision is best: The derangements and bleeding reinforce each other. Parallel correction supports, but does not replace, mechanical control.

Analysis of the options

A - Inferior in this scenario: A single corrected deficit leaves other important mechanisms active.

B - Inferior in this scenario: Crystalloid does not replace targeted hemostatic treatment and can aggravate dilution/cooling.

C - Inferior in this scenario: Continued bleeding may prevent normalization and worsen the delay.

D - Best answer: The derangements and bleeding reinforce each other. Parallel correction supports, but does not replace, mechanical control.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 35 | Circulation and hemorrhage

A 49-year-old with major bleeding has received several red-cell units but no other hemostatic support. The hospital has a balanced component pathway and rapid laboratory testing. A resident wants to continue red cells alone until an abnormal INR returns because the blood pressure has improved. Ongoing surgical bleeding and transfusion requirements remain substantial. The blood bank asks which pathway to release and whether reassessment will guide subsequent products. The initial pressure improvement depends on continuing transfusion, and source control is not complete. The blood bank can provide protocol products promptly and later tailor delivery to results. The team needs an activation decision based on expected ongoing loss rather than retrospective totals. The challenge is preventing predictable hemostatic failure without abandoning subsequent individualized reassessment of what the patient actually needs. Select the single best next decision under the capabilities and constraints described. What is the best instruction?

A. Wait for a retrospective massive-transfusion total before activation.

B. Continue red cells alone until severe coagulopathy is documented.

C. Stop transfusion because one pressure reading improved.

D. Activate balanced hemostatic support through the protocol and adapt to timely results and clinical response.

Answer: D

Why this decision is best: Major ongoing loss requires hemostatic resuscitation rather than red cells alone; subsequent treatment should follow deficits and trajectory.

Analysis of the options

A - Inferior in this scenario: A retrospective definition is not an activation rule.

B - Inferior in this scenario: A delayed abnormal test is not required before addressing predictable hemostatic needs.

C - Inferior in this scenario: Support-dependent improvement does not establish bleeding control.

D - Best answer: Major ongoing loss requires hemostatic resuscitation rather than red cells alone; subsequent treatment should follow deficits and trajectory.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 36 | Circulation and hemorrhage

A 56-year-old with suspected severe head injury also has active abdominal hemorrhage. During blood support a trainee recommends allowing profound hypotension because restrictive resuscitation is used in trauma. Pupils have changed and motor responses are worsening. The operating team is ready, and oxygenation is satisfactory. Another clinician proposes rapidly normalizing pressure with large-volume crystalloid before any control is attempted. The team is not choosing between hemorrhage and brain injury as mutually exclusive diagnoses. A prolonged low-pressure strategy could add secondary neurological injury, while uncontrolled volume loading could delay or complicate control. The operative route is already available. The leader needs a coordinated resuscitation objective that protects threatened brain perfusion without losing the time-sensitive priority of stopping active blood loss. Select the single best next decision under the capabilities and constraints described. Which strategy best balances the threats?

A. Individualize perfusion to protect the brain while rapidly controlling hemorrhage with blood-based support.

B. Apply the same low-pressure target used for every bleeding adult.

C. Normalize all pressure values with crystalloid before operation.

D. Delay hemorrhage control until a neurosurgical examination is complete.

Answer: A

Why this decision is best: Brain injury modifies tolerance of hypotension. Coordinated perfusion support and rapid control address both threats.

Analysis of the options

A - Best answer: Brain injury modifies tolerance of hypotension. Coordinated perfusion support and rapid control address both threats.

B - Inferior in this scenario: A universal target ignores cerebral perfusion risk.

C - Inferior in this scenario: Large-volume crystalloid can add harm and delay definitive control.

D - Inferior in this scenario: An examination cannot take precedence over untreated life-threatening loss.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 37 | Circulation and hemorrhage

A 31-year-old arrives 70 minutes after injury with suspected major bleeding and worsening shock. Blood support and source-control activation are underway. The clinician considers tranexamic acid, but a trainee wants to wait for a formal fibrinolysis result. The patient has no stated contraindication and is within the usual early treatment window. The laboratory result is expected after the patient has left for the operating room. The clinician can deliver the adjunct while the procedural team works toward control, and its use need not postpone transport to the operating room. The laboratory may later guide other hemostatic treatments. The question is whether waiting for more diagnostic detail improves this time-sensitive decision. Treatment should remain part of a broader rescue pathway with reassessment of bleeding and physiology. Select the single best next decision under the capabilities and constraints described. Which action is most appropriate?

A. Wait for documented hyperfibrinolysis before any early TXA use.

B. Use TXA as a reason to defer definitive control.

C. Delay TXA until several hours after injury to assess the response to blood.

D. Give indicated early TXA through the protocol without delaying hemorrhage control for the laboratory result.

Answer: D

Why this decision is best: Early TXA is a time-sensitive adjunct for indicated traumatic bleeding, not a replacement for control.

Analysis of the options

A - Inferior in this scenario: An early eligible bleeding patient need not await this test before indicated treatment.

B - Inferior in this scenario: Antifibrinolysis does not repair the bleeding lesion.

C - Inferior in this scenario: Delay can miss the intended therapeutic window.

D - Best answer: Early TXA is a time-sensitive adjunct for indicated traumatic bleeding, not a replacement for control.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 38 | Circulation and hemorrhage

A 45-year-old presents five hours after injury with active bleeding. The transfer note contains no evidence that TXA was administered. A trainee proposes starting it automatically because all bleeding trauma patients should receive it. Viscoelastic testing has not shown hyperfibrinolysis, and control is being arranged. The patient needs urgent source-directed treatment regardless of the medication decision. The timing history is credible and refers to the injury rather than arrival at the current hospital. The patient still requires hemostatic resuscitation and an urgent source-control plan. The medication decision should follow the applicable evidence and protocol, not a desire to compensate mechanically for a previous omission. A late opportunity is not necessarily equivalent to the intended early treatment window. Select the single best next decision under the capabilities and constraints described. What is the best response?

A. Administer it automatically because arrival time defines the treatment window.

B. Delay source control until TXA has been given.

C. Treat the missed early dose as justification for doubling a late dose.

D. Do not routinely initiate late TXA without an appropriate specific indication; prioritize control and protocol-guided resuscitation.

Answer: D

Why this decision is best: The relevant window is measured from injury. Routine late initiation is not justified by a missed early opportunity.

Analysis of the options

A - Inferior in this scenario: Hospital arrival does not reset time since injury.

B - Inferior in this scenario: Medication timing does not remove the need for urgent control.

C - Inferior in this scenario: A higher late dose is not a substitute for evidence-based timing.

D - Best answer: The relevant window is measured from injury. Routine late initiation is not justified by a missed early opportunity.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 39 | Circulation and hemorrhage

A 34-year-old with refractory shock has a clear major bleeding source and new unilateral quietness after ventilation. Blood support has little effect. The resident wants to choose either hemorrhagic or obstructive shock before treating further. The chest findings were absent initially, and no recent reassessment has occurred. Skilled decompression and operative teams are immediately available. The patient is rapidly losing responsiveness. The original bleeding source still needs treatment, while the new examination finding may explain why blood alone has not restored circulation. Both available teams can act without waiting for a single diagnostic label. The patient's loss of reserve makes serial diagnostic debate hazardous. The decision must recognize that shock mechanisms may interact and that one correct diagnosis can remain incomplete. Select the single best next decision under the capabilities and constraints described. Which reasoning is best?

A. Wait for CT to assign a single shock diagnosis.

B. Evaluate and treat the new mechanical threat immediately while continuing hemorrhage control efforts.

C. Suspend hemorrhage treatment until the shock category is certain.

D. Ignore the chest finding because hemorrhage is already established.

Answer: B

Why this decision is best: Mixed mechanisms are common enough to require parallel action; a new reversible obstruction can coexist with major loss.

Analysis of the options

A - Inferior in this scenario: A single-label diagnosis is unnecessary before treating collapse-compatible bedside findings.

B - Best answer: Mixed mechanisms are common enough to require parallel action; a new reversible obstruction can coexist with major loss.

C - Inferior in this scenario: Diagnostic categories should not interrupt treatment of a known source.

D - Inferior in this scenario: One explanation does not exclude another evolving threat.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 40 | Circulation and hemorrhage

A 60-year-old improves after abdominal hemostasis, but still requires increasing support and has persistent acidosis. The operative note records adequate control of one lesion. No one has reassessed the chest, pelvis or external wounds since induction. A clinician assumes all abnormalities represent residual oxygen debt and requests ICU admission without further evaluation. The patient has new abdominal distension and a changing drain output. The operation addressed an identified lesion, not necessarily every possible cause of continuing deterioration. The new findings are not explained simply by the word postoperative. The surgical team remains available for reassessment and can reconsider whether urgent return or another intervention is needed. The expected response to effective control provides a benchmark against which the current worsening must be judged. Select the single best next decision under the capabilities and constraints described. What is the best next judgment?

A. Wait overnight for lactate clearance before reassessment.

B. Assume an operative note guarantees all bleeding is controlled.

C. Treat every abnormality with a pressor increase alone.

D. Reassess ongoing or additional bleeding and treatment complications before attributing deterioration solely to residual shock.

Answer: D

Why this decision is best: Failure of the expected recovery trajectory requires renewed source and complication assessment, including the effectiveness of the operation.

Analysis of the options

A - Inferior in this scenario: Waiting can allow a correctable failure to progress.

B - Inferior in this scenario: One controlled lesion does not establish whole-patient hemostasis.

C - Inferior in this scenario: Pressure support alone does not explain or control the cause.

D - Best answer: Failure of the expected recovery trajectory requires renewed source and complication assessment, including the effectiveness of the operation.

Review: teaching domain 4; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 41 | Disability, exposure and temperature

A 28-year-old initially follows commands in all limbs after a collision. During resuscitation he stops moving the left arm and develops a larger sluggish right pupil. No sedative has been given. Pressure has fallen again despite blood. One clinician attributes all neurological change to shock; another wants immediate CT without addressing the deteriorating circulation. Neurosurgical consultation and local operative hemorrhage control can be arranged in parallel. The earlier neurological findings were obtained before shock and before the pupil changed. A stable oxygen saturation does not establish adequate cerebral perfusion, and a focal deficit cannot safely be dismissed as generalized fatigue. The available teams need a shared sequence with explicit reassessment. The decision must protect both systemic circulation and the threatened brain without allowing one service's task to obscure the other. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Move to remote CT regardless of support requirements.

B. Escalate suspected intracranial deterioration while immediately protecting oxygenation/perfusion and coordinating the safest urgent diagnostic/control route.

C. Treat the pupil change with routine hyperventilation and defer consultation.

D. Dismiss focal change until shock is fully corrected.

Answer: B

Why this decision is best: A true new lateralizing change requires urgent action alongside systemic rescue. Neither threat can be ignored.

Analysis of the options

A - Inferior in this scenario: Diagnostic urgency does not eliminate transport risk.

B - Best answer: A true new lateralizing change requires urgent action alongside systemic rescue. Neither threat can be ignored.

C - Inferior in this scenario: Uncontrolled routine hyperventilation may reduce cerebral flow and is not definitive care.

D - Inferior in this scenario: Shock can confound consciousness but does not justify dismissing new focal findings.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 42 | Disability, exposure and temperature

A 54-year-old obeys commands with the right hand but has no purposeful movement in the left arm. He opens his eyes to sound and speaks confused sentences. The trainee reports only GCS 13 and says motor function is normal because the best motor score is 6. The asymmetry persists on repeat assessment and was not documented before transfer. Brain and limb injury remain possible. The limb discrepancy remains when the examiner repeats commands with adequate communication. The best motor response correctly contributes to the score, but the score is not intended to replace a regional examination. The receiving team needs enough detail to recognize change. The question tests whether the clinician preserves clinically important asymmetry while using a standardized scale rather than distorting the scale itself. Select the single best next decision under the capabilities and constraints described. What documentation and response are most appropriate?

A. Report only the total because it includes all important information.

B. Reduce the best motor score to zero for the weaker limb.

C. Record E3 V4 M6 plus the separate focal deficit and arrange urgent targeted reassessment.

D. Assume command-following on one side excludes important neurological injury.

Answer: C

Why this decision is best: The best response determines the component, but lateralizing findings must be preserved separately and acted on.

Analysis of the options

A - Inferior in this scenario: The total conceals clinically important asymmetry.

B - Inferior in this scenario: This is not a valid GCS scoring method.

C - Best answer: The best response determines the component, but lateralizing findings must be preserved separately and acted on.

D - Inferior in this scenario: A high best motor response does not exclude focal brain or peripheral injury.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 43 | Disability, exposure and temperature

A 66-year-old arrives intubated after receiving sedatives and a paralytic. There is no motor response, the verbal component is untestable and eyelid swelling limits eye assessment. The team has a reliable earlier description of bilateral command-following. A clinician proposes comparing a current total of 3 with the prior description to diagnose dramatic neurological deterioration and justify delaying hemorrhage treatment for prognostic imaging. The timing and duration of administered drugs can be clarified from the transport record. The patient has not yet had an opportunity for a reliable postmedication examination. Treatment decisions should be based on evidence that is interpretable under those conditions. The team must distinguish an observed neurological deterioration from an assessment that has temporarily lost the ability to measure several responses. Select the single best next decision under the capabilities and constraints described. What is the best interpretation?

A. Disregard the earlier examination because no total was written.

B. Conclude that absent movement proves irreversible injury.

C. Assign every untestable component the lowest score as a measured response.

D. The current components are limited or untestable; document confounders and retain the reliable predrug baseline.

Answer: D

Why this decision is best: Medication and anatomical limitations prevent a comparable measured total. The prior descriptive examination remains valuable.

Analysis of the options

A - Inferior in this scenario: Component descriptions can be clinically interpretable without a total.

B - Inferior in this scenario: Irreversibility cannot be inferred from a pharmacologically obscured examination.

C - Inferior in this scenario: Untestability is not the same as an observed absent response.

D - Best answer: Medication and anatomical limitations prevent a comparable measured total. The prior descriptive examination remains valuable.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 44 | Disability, exposure and temperature

A 35-year-old with suspected head injury has declining consciousness and a glucose of 34 mg/dL. He also has facial bruising and a recent collision. The nurse prepares protocol-directed glucose treatment. A resident argues that all symptoms are explained by hypoglycemia and wants to cancel trauma evaluation once consciousness improves. No complete neurological reassessment or appropriate injury investigation has yet occurred. Improvement after treatment would establish that glucose contributed, but would not tell the team whether another injury is present. The mechanism and external findings remain relevant, and the initial assessment was incomplete. A repeat reliable examination could help direct subsequent testing. The clinician must correct the metabolic emergency without converting a useful response into an unjustified exclusion rule for traumatic pathology. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Delay glucose until intracranial imaging is complete.

B. Correct hypoglycemia promptly and continue injury-directed assessment with repeat neurological findings.

C. Assume low glucose excludes a structural traumatic lesion.

D. Cancel injury evaluation after any initial improvement.

Answer: B

Why this decision is best: A reversible metabolic contributor requires immediate treatment but can coexist with trauma.

Analysis of the options

A - Inferior in this scenario: Waiting leaves a treatable neurological insult active.

B - Best answer: A reversible metabolic contributor requires immediate treatment but can coexist with trauma.

C - Inferior in this scenario: One demonstrated cause does not eliminate a second mechanism.

D - Inferior in this scenario: Improvement does not establish that all injuries have been excluded.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 45 | Disability, exposure and temperature

A 42-year-old with leg weakness and relative bradycardia is hypotensive after a fall. He has flank bruising and a swollen thigh. The trainee calls this spinal shock and proposes pressors without further hemorrhage assessment. FAST is negative, and the patient cannot localize pain reliably. The receiving spinal service is available for consultation, but definitive bleeding control must be coordinated separately. The relative bradycardia makes sympathetic dysfunction possible, but the swollen limb and bruising also require attention. There is no evidence that every bleeding compartment has been evaluated. Immediate perfusion support and careful handling are needed while the source assessment proceeds. The surgeon must avoid allowing a plausible spinal diagnosis, or imprecise terminology, to become a reason for leaving hemorrhage untreated. Select the single best next decision under the capabilities and constraints described. What is the best correction?

A. Clear the spine because weakness may be medication-related.

B. Treat the terms as interchangeable and stop bleeding evaluation.

C. Use bradycardia to exclude significant blood loss.

D. Distinguish neurogenic circulatory shock from spinal shock and assess simultaneous hemorrhage while supporting perfusion.

Answer: D

Why this decision is best: The syndromes differ, and cord injury can coexist with hemorrhage. The signs support a possibility rather than a complete diagnosis.

Analysis of the options

A - Inferior in this scenario: A possible confounder does not establish safe clearance.

B - Inferior in this scenario: Terminological confusion can conceal untreated circulatory threats.

C - Inferior in this scenario: Relative bradycardia does not reliably exclude loss in this context.

D - Best answer: The syndromes differ, and cord injury can coexist with hemorrhage. The signs support a possibility rather than a complete diagnosis.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 46 | Disability, exposure and temperature

A 39-year-old is uncovered during a prolonged trauma assessment. Temperature falls from 36.0 to 34.8 C while blood is infused. The team has ordered warming, but the device remains disconnected and wet clothing lies beneath the patient. Coagulation is worsening. A resident suggests postponing warming until imaging is finished because exposure must remain complete for examination and lines need to stay visible. The nurse can reconnect the approved warming device and use staged exposure so that essential access remains visible. The patient's thermal deterioration is occurring during active treatment rather than before arrival alone. Further cooling may worsen hemostasis while bleeding continues. The leader needs to verify what is actually being delivered, not just what appears on the orders, and integrate environmental control into resuscitation. Select the single best next decision under the capabilities and constraints described. What action is best?

A. Treat the warming order as proof that warming is occurring.

B. Keep the patient fully uncovered until every investigation is complete.

C. Remove wet material safely, re-cover examined regions and deliver monitored warming alongside ongoing treatment.

D. Delay hemorrhage control until the temperature is normal.

Answer: C

Why this decision is best: Examination and heat conservation are compatible through staged exposure. Actual delivery must be verified.

Analysis of the options

A - Inferior in this scenario: An unimplemented order has no therapeutic effect.

B - Inferior in this scenario: Exposure is a diagnostic task, not a requirement for prolonged heat loss.

C - Best answer: Examination and heat conservation are compatible through staged exposure. Actual delivery must be verified.

D - Inferior in this scenario: Warming should accompany control rather than postpone it.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 47 | Disability, exposure and temperature

A 57-year-old with an unstable pelvis, secured airway and multiple drains requires posterior examination. Pressure falls with movement and blood is still being delivered rapidly. The resident requests an immediate routine log roll to complete the form. Adequate staff for a coordinated safe maneuver are temporarily unavailable. There is no current specific posterior finding that would change the next lifesaving intervention. The posterior region still needs assessment, and the incomplete task must be visible at the next handover. Adequate assistance and a suitable movement technique can be arranged once the immediate circulatory risk is addressed. Deferral is not the same as abandonment. The clinician must choose a safe time and accountable plan rather than either force movement or fabricate a completed examination. Select the single best next decision under the capabilities and constraints described. Which decision is most appropriate?

A. Defer nonessential destabilizing movement, document the limitation and assign a coordinated examination when support permits.

B. Roll immediately because exposure must follow a fixed sequence.

C. Mark the posterior examination normal without inspection.

D. Never examine the posterior surfaces because pelvic injury is present.

Answer: A

Why this decision is best: Timing and technique should protect physiology and injuries. Deferral requires ownership rather than concealment.

Analysis of the options

A - Best answer: Timing and technique should protect physiology and injuries. Deferral requires ownership rather than concealment.

B - Inferior in this scenario: Checklist completion does not justify avoidable destabilization.

C - Inferior in this scenario: Unexamined is not equivalent to normal.

D - Inferior in this scenario: A temporary limitation does not remove the need for later appropriate assessment.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 48 | Disability, exposure and temperature

A 47-year-old with traumatic brain injury is ventilated with normal oxygenation and no current signs of herniation. A trainee deliberately lowers carbon dioxide well below normal as routine prevention of intracranial swelling. The patient also has hemorrhagic shock, increasing concern about brain perfusion. No specialist-directed rescue indication has been established. The team can obtain blood gases and adjust ventilation promptly. The patient has no stated specialist-directed indication for this level of carbon-dioxide reduction. A normal saturation cannot describe changes in cerebral blood flow. The available monitoring permits a controlled adjustment while the team continues to protect circulation and obtain appropriate specialist input. The decision concerns whether a rescue maneuver has been inappropriately transformed into routine prophylaxis for a different clinical situation. Select the single best next decision under the capabilities and constraints described. Which change is best?

A. Accept low carbon dioxide because saturation remains normal.

B. Use hyperventilation instead of addressing hypotension.

C. Restore appropriate controlled ventilation and avoid prophylactic excessive hyperventilation while protecting perfusion.

D. Continue profound hyperventilation for every suspected brain injury.

Answer: C

Why this decision is best: Unnecessary hypocapnia can reduce cerebral blood flow; normoxia and appropriate ventilation accompany perfusion protection.

Analysis of the options

A - Inferior in this scenario: Saturation does not measure the cerebral flow consequence of hypocapnia.

B - Inferior in this scenario: Ventilation manipulation cannot substitute for circulatory rescue.

C - Best answer: Unnecessary hypocapnia can reduce cerebral blood flow; normoxia and appropriate ventilation accompany perfusion protection.

D - Inferior in this scenario: Rescue use in selected deterioration does not justify routine use.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 49 | Disability, exposure and temperature

A 72-year-old arrives after prolonged outdoor exposure and trauma. Temperature is 33.7 C, pressure is low and mental state is impaired. The team recognizes hypothermia but assumes it explains all findings and delays the bleeding search. FAST is limited, a thigh is swollen and anticoagulant history is incomplete. Warming equipment is available while surgical and transfusion teams are being contacted. The patient may need a dedicated hypothermia pathway if severity or rhythm abnormalities warrant it, but those considerations do not explain away the traumatic findings. The current team can warm while evaluating sources and supporting circulation. A single-cause explanation is attractive because it appears coherent, yet the signs may reflect interacting conditions. The decision must retain both thermal and hemorrhagic rescue tasks. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Use the limited FAST as a definitive negative result.

B. Withhold blood until neurological assessment becomes reliable.

C. Treat cooling and investigate traumatic shock simultaneously, without attributing all abnormalities to temperature.

D. Complete rewarming before evaluating hemorrhage.

Answer: C

Why this decision is best: Hypothermia can coexist with and worsen hemorrhage. Parallel treatment prevents diagnostic anchoring.

Analysis of the options

A - Inferior in this scenario: A limited examination cannot exclude concealed injury.

B - Inferior in this scenario: Resuscitation should not depend on restoration of a reliable neurological examination.

C - Best answer: Hypothermia can coexist with and worsen hemorrhage. Parallel treatment prevents diagnostic anchoring.

D - Inferior in this scenario: Delay can permit ongoing loss and further cooling.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 50 | Disability, exposure and temperature

A 33-year-old has new pupillary inequality after facial trauma. The affected eye is swollen and vision cannot be assessed reliably. The blood pressure is currently supportable, but earlier neurological findings were not recorded. A clinician assumes the pupil is solely an ocular problem; another assumes it proves brain herniation. Appropriate head imaging and urgent ocular/neurosurgical assessment can be coordinated. The ocular examination may require immediate specialist support, while intracranial assessment also remains important. Neither the presence of facial injury nor the pupil finding alone determines the entire explanation. The patient can currently undergo focused investigation, and any further physiological change should alter urgency. The team must preserve diagnostic alternatives without letting uncertainty postpone assessment of a potentially threatened brain or eye. Select the single best next decision under the capabilities and constraints described. Which interpretation is best?

A. Attribute it to ocular trauma without further assessment.

B. Treat the new finding as urgent, assessing both intracranial and ocular explanations with systemic reassessment.

C. Regard it as definitive proof of one intracranial lesion.

D. Wait for swelling to resolve before examining further.

Answer: B

Why this decision is best: Both ocular and intracranial processes may be time-sensitive; missing baseline increases uncertainty rather than reducing urgency.

Analysis of the options

A - Inferior in this scenario: A plausible local explanation does not exclude brain injury.

B - Best answer: Both ocular and intracranial processes may be time-sensitive; missing baseline increases uncertainty rather than reducing urgency.

C - Inferior in this scenario: The sign is concerning but not pathognomonic.

D - Inferior in this scenario: Waiting can sacrifice neurological or visual function.

Review: teaching domain 5; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 51 | Adjuncts and imaging

A 44-year-old with blunt trauma remains supportable after initial treatment. He has a belt mark, focal abdominal tenderness and no free fluid on FAST. CT is immediately available with continued monitoring. The resident proposes canceling CT because ultrasound has already screened the abdomen. The patient has no current operative indication, but examination and mechanism continue to raise concern for bowel or mesenteric injury. The patient can remain monitored while the indicated study is organized, and no immediate clinical indication requires exploration before imaging. The belt mark and focal examination create a question ultrasound cannot resolve. The team should avoid both indiscriminate operation and premature discharge. The decision is about selecting the right next test in a patient who can tolerate it. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Repeat FAST until it becomes positive before ordering CT.

B. Proceed directly to laparotomy solely because a belt mark is present.

C. Discharge because FAST is negative and pressure is normal.

D. Obtain appropriate injury-directed CT rather than use negative FAST to cancel it.

Answer: D

Why this decision is best: The clinical question remains unresolved. FAST cannot exclude important bowel or mesenteric injury and is not a gatekeeper for indicated CT.

Analysis of the options

A - Inferior in this scenario: Repeated focused scans can delay the appropriate study.

B - Inferior in this scenario: The sign raises suspicion but does not alone establish an operative indication.

C - Inferior in this scenario: Normal physiology and one negative focused test do not settle the injury concern.

D - Best answer: The clinical question remains unresolved. FAST cannot exclude important bowel or mesenteric injury and is not a gatekeeper for indicated CT.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 52 | Adjuncts and imaging

A 61-year-old remains hypotensive despite blood and has a clearly positive abdominal FAST. CT requires transport to another building. The operating team can start immediately, and no competing injury has been identified that changes the urgent route. A radiology request has already been booked, so a trainee wants to complete it before canceling. The surgeon is asked whether anatomical certainty is required first. The indication for control is based on a credible source and a deteriorating response rather than on one isolated low reading. Additional images might name the organ but are unlikely to remove the immediate need for treatment. The patient cannot safely spend time satisfying an already booked pathway. The surgeon must decide whether scheduling momentum has become a source of avoidable delay. Select the single best next decision under the capabilities and constraints described. What is the best choice?

A. Prioritize urgent operative control rather than complete the booked remote scan.

B. Wait for a second positive FAST by another operator.

C. Delay treatment until the exact injured organ is known.

D. Perform the scan because it has already been arranged.

Answer: A

Why this decision is best: The existing findings and trajectory support urgent control. Administrative momentum is not a clinical indication for delay.

Analysis of the options

A - Best answer: The existing findings and trajectory support urgent control. Administrative momentum is not a clinical indication for delay.

B - Inferior in this scenario: Redundant confirmation should not postpone established lifesaving action.

C - Inferior in this scenario: Compartment-level evidence can be sufficient for an emergency decision.

D - Inferior in this scenario: Booking does not establish benefit or safety.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 53 | Adjuncts and imaging

A 25-year-old with suspected multiple blunt injuries is alert and remains stable without increasing support. Immediate appropriately protocolled CT is ready. A team member insists on chest and pelvic films plus repeated FAST first because these are traditional adjuncts. None of those studies is expected to change the decision or treatment before CT. The receiving radiologist has already discussed coverage with the trauma leader. The patient has no current respiratory compromise requiring a bedside chest intervention before scanning. Appropriate resuscitation personnel can accompany the study and treatment will continue if needed. The team is being asked to distinguish useful adjuncts from ritual prerequisites. The clinically justified CT decision should not be delayed by tests whose likely results would not change the immediate plan. Select the single best next decision under the capabilities and constraints described. What is the most appropriate sequence?

A. Cancel CT if any FAST view is negative.

B. Proceed with indicated immediate CT while maintaining monitoring and avoiding redundant preliminaries.

C. Complete all bedside studies as mandatory prerequisites.

D. Use a noncontrast torso scan by default to avoid discussing protocol.

Answer: B

Why this decision is best: Tests should answer decisions; redundant studies can delay appropriate CT in a supportable patient.

Analysis of the options

A - Inferior in this scenario: Negative focused ultrasound does not settle multisystem injury.

B - Best answer: Tests should answer decisions; redundant studies can delay appropriate CT in a supportable patient.

C - Inferior in this scenario: A traditional sequence is not valuable when it adds no actionable information.

D - Inferior in this scenario: Protocol must answer relevant vascular and organ questions.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 54 | Adjuncts and imaging

A 53-year-old has persistent shock and a limited FAST because of body habitus and dressings. The report is verbally shortened to negative. The pelvis and chest have not been fully reassessed. A clinician proposes remote CT because bedside imaging is unhelpful, although support requirements are rising. The local surgeon can examine immediately and additional targeted bedside information may direct control. A negative label could make the next team falsely stop looking for hemorrhage, whereas a limited label preserves the unanswered question. The patient's increasing support needs also change what investigation is tolerable. The leader must synthesize both technical uncertainty and physiological urgency. The goal is not simply to obtain a better image but to reach an effective, timely management decision. Select the single best next decision under the capabilities and constraints described. What is the best response?

A. Continue repeating the same inadequate views without a decision deadline.

B. Correct the report to limited, reassess immediate threats and choose a supportable control-directed pathway.

C. Use CT automatically regardless of transport risk.

D. Treat limited views as equivalent to a normal comprehensive study.

Answer: B

Why this decision is best: Technical limitation leaves uncertainty. The next step follows physiology, actionable information and rescue capability.

Analysis of the options

A - Inferior in this scenario: Repeated ineffective testing can delay necessary control.

B - Best answer: Technical limitation leaves uncertainty. The next step follows physiology, actionable information and rescue capability.

C - Inferior in this scenario: Diagnostic difficulty does not remove the risk of transporting a deteriorating patient.

D - Inferior in this scenario: A missing view cannot be interpreted as absence of injury.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 55 | Adjuncts and imaging

A 48-year-old with suspected aortic injury is stable enough for imaging. A routine nonangiographic chest study is suggested because it is already on the default order set. The radiologist asks about the mechanism, suspected lesion and acquisition timing. A resident says all CT examinations are equivalent once contrast is given. There is no immediate need to bypass imaging for an operative emergency. Radiology can tailor coverage and timing once the suspected lesion is clearly stated. A generic default might show some abnormalities while missing the decisive vascular information. The patient is stable enough for a deliberate protocol choice, so avoidable diagnostic inadequacy should not be accepted. The surgeon must ensure that the examination requested is capable of answering the question driving the next treatment decision. Select the single best next decision under the capabilities and constraints described. Which action best improves the diagnostic decision?

A. Agree an injury-appropriate angiographic protocol with radiology and communicate the precise vascular concern.

B. Perform a plain chest film instead because it is faster.

C. Order every possible phase without considering the clinical question.

D. Accept any contrast study as equally exclusionary.

Answer: A

Why this decision is best: Coverage and contrast timing determine whether the vascular question is answered adequately.

Analysis of the options

A - Best answer: Coverage and contrast timing determine whether the vascular question is answered adequately.

B - Inferior in this scenario: A plain film cannot adequately exclude the suspected lesion.

C - Inferior in this scenario: Indiscriminate phases add burden without necessarily improving relevant information.

D - Inferior in this scenario: Contrast presence alone does not guarantee a diagnostic vascular acquisition.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 56 | Adjuncts and imaging

A 36-year-old is undergoing CT after a sustained initial response. During acquisition pressure falls sharply, capnography changes and blood delivery is interrupted. Only a short final sequence remains. The radiographer asks whether to finish before returning to resuscitation. The escort has airway and circulation rescue equipment, and the trauma leader can be contacted immediately. The patient is becoming less responsive. The departure decision was valid under earlier conditions but is now being challenged by new evidence. The escort can check ventilation, delivery systems and circulation immediately. The value of finishing the scan has fallen as the risk of untreated collapse has risen. The team needs to use the contingency plan rather than let a nearly completed procedure dictate continued exposure to danger. Select the single best next decision under the capabilities and constraints described. What is the best action?

A. Stop acquisition, reassess and treat the new immediate threat with the agreed rescue plan.

B. Wait for image interpretation before checking blood delivery.

C. Complete the remaining sequence because it is nearly finished.

D. Assume the scanner caused an artifact and continue.

Answer: A

Why this decision is best: A new physiological emergency invalidates prior eligibility and takes priority over completing a diagnostic package.

Analysis of the options

A - Best answer: A new physiological emergency invalidates prior eligibility and takes priority over completing a diagnostic package.

B - Inferior in this scenario: Support failure and reversible threats require immediate assessment.

C - Inferior in this scenario: Near-completion does not outweigh threatened circulation or ventilation.

D - Inferior in this scenario: Artifact should be checked, not presumed against concurrent clinical deterioration.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 57 | Adjuncts and imaging

A 69-year-old has renal impairment and a strong concern for life-threatening torso vascular injury. He is currently supportable. A clinician requests a noncontrast-only study to eliminate contrast risk, although radiology says it may not answer the urgent question. Another proposes no imaging until renal function improves. The trauma surgeon must weigh the immediate injury risk against diagnostic and renal concerns. A poorly informative study could lead to repeat contrast, repeated transport or delayed treatment rather than provide a true safety advantage. The patient's renal history deserves consideration, but so does the urgency and consequence of a missed lesion. The decision should be explained and documented with relevant expertise. Avoiding all immediate diagnostic risk is not the same as minimizing overall patient harm. Select the single best next decision under the capabilities and constraints described. Which decision is most defensible?

A. Wait for renal recovery before investigating the suspected lethal lesion.

B. Choose a knowingly inadequate study as a universal compromise.

C. Ignore renal history and omit all communication with radiology.

D. Discuss the risk-benefit balance and use a diagnostic injury-appropriate protocol when its immediate benefit outweighs the concern.

Answer: D

Why this decision is best: A nondiagnostic compromise may add delay and repeat exposure. Individualized selection should address the immediate question and relevant risks.

Analysis of the options

A - Inferior in this scenario: The untreated injury may not permit delay.

B - Inferior in this scenario: Avoiding one risk is not helpful if it prevents necessary diagnosis.

C - Inferior in this scenario: The decision should acknowledge risk and use appropriate expertise rather than dismiss it.

D - Best answer: A nondiagnostic compromise may add delay and repeat exposure. Individualized selection should address the immediate question and relevant risks.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 58 | Adjuncts and imaging

A 40-year-old after pelvic trauma has gross hematuria and lower abdominal symptoms. Routine abdominal CT was described as without major renal injury, but no dedicated bladder study was performed. A trainee concludes that the entire urinary tract has been cleared. The patient is stable and specialist evaluation is available. Meatal findings and catheter history need clarification before further instrumentation. The stable setting permits a focused investigation rather than blind instrumentation. A report about the kidneys does not establish whether the bladder was adequately distended or the urethra assessed. The team needs to identify what the previous study actually answered. The next action should follow the suspected anatomical problem while preventing an unnecessary iatrogenic injury during evaluation. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Use the routine CT report to exclude bladder and urethral injury.

B. Delay targeted assessment until shock develops.

C. Assess the specific urinary injury concern and obtain indicated dedicated studies with appropriate catheter precautions.

D. Force catheter passage to see whether urine clears.

Answer: C

Why this decision is best: Routine CT does not answer every bladder or urethral question; testing and instrumentation must match the suspected injury.

Analysis of the options

A - Inferior in this scenario: Absence of renal injury is not clearance of the entire tract.

B - Inferior in this scenario: Stable physiology permits timely evaluation rather than waiting for deterioration.

C - Best answer: Routine CT does not answer every bladder or urethral question; testing and instrumentation must match the suspected injury.

D - Inferior in this scenario: Blind force can aggravate a suspected urethral lesion.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 59 | Adjuncts and imaging

A 57-year-old has a CT report initially summarized as minor mesenteric bruising. Hours later abdominal pain and tenderness increase, with persistent tachycardia. The pressure remains acceptable and hemoglobin changes little. The team considers discharge because the first scan showed no free air. The final report contains unexplained fluid and recommends clinical correlation. A senior surgeon can reassess immediately. The new tenderness is more specific than a general complaint of discomfort and has changed over serial observations. A normal pressure does not exclude bowel ischemia or contamination before systemic decompensation. The final interpretation and bedside findings need to be considered together. The team must decide whether further information is needed or whether the current clinical examination already establishes the treatment indication. Select the single best next decision under the capabilities and constraints described. What is the best next action?

A. Wait for hemoglobin to fall before reconsidering the abdomen.

B. Treat the preliminary summary as more authoritative than evolving examination.

C. Discharge because absence of free air excludes important bowel injury.

D. Urgent senior reassessment, with exploration if clinically indicated or targeted further evaluation when findings remain equivocal.

Answer: D

Why this decision is best: Bowel/mesenteric injury can evolve or be subtle. Current findings must be reconciled with uncertainty in the report.

Analysis of the options

A - Inferior in this scenario: The threat may be contamination or ischemia rather than hemorrhage.

B - Inferior in this scenario: New clinical evidence can legitimately change the plan.

C - Inferior in this scenario: Free air is not required for every important bowel or mesenteric lesion.

D - Best answer: Bowel/mesenteric injury can evolve or be subtle. Current findings must be reconciled with uncertainty in the report.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 60 | Adjuncts and imaging

A 46-year-old with multiple injuries is improving and may transfer to a specialist center. The referring hospital wants additional local scans, none expected to change pretransfer treatment. Images already obtained can be sent electronically. Transport and receiving teams are ready, but the added studies would delay departure by an hour. No immediate unresolved threat requires a local procedure first. The receiving center can complete relevant investigations and provide the missing treatment if needed. The proposed local studies would add detail but would not change oxygenation, blood support or destination before departure. The patient still needs a competent escort and explicit pending-question handover. Efficient transfer requires distinguishing useful preparation from diagnostic work that merely postpones access to definitive capability. Select the single best next decision under the capabilities and constraints described. Which strategy is best?

A. Complete every possible local study before departure.

B. Transfer with appropriate support and communicate existing images and unresolved questions rather than delay for nonessential studies.

C. Cancel transfer because current pressure is satisfactory.

D. Send the patient without any reports because the receiving center will repeat imaging.

Answer: B

Why this decision is best: When required specialist care is elsewhere, tests that do not affect pretransfer decisions should not consume a useful transport opportunity.

Analysis of the options

A - Inferior in this scenario: Completeness of local imaging is not the goal when it adds avoidable delay.

B - Best answer: When required specialist care is elsewhere, tests that do not affect pretransfer decisions should not consume a useful transport opportunity.

C - Inferior in this scenario: Improved physiology does not supply missing definitive capability.

D - Inferior in this scenario: Information continuity reduces duplication and diagnostic gaps.

Review: teaching domain 6; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 61 | Secondary survey and missed injuries

A 38-year-old with a painful tibial fracture has a secondary survey interrupted for urgent fixation. He was initially unable to cooperate because of pain and medication. The next morning he reports heel pain on the opposite side and focal back tenderness. The torso CT was summarized as negative, and no dedicated foot examination is documented. A resident says the operation addressed the only important injury and proposes discharge planning. The patient is now able to report pain that could not be localized during the initial resuscitation. The opposite limb and spine were not the dominant treatment targets earlier. Actual scan coverage can be checked rather than inferred from its summary title. The new examination should direct further assessment, while urgent problems in the already treated limb must still be monitored and addressed. Select the single best next decision under the capabilities and constraints described. Which action is best?

A. Attribute all pain to postoperative immobility without examination.

B. Complete repeat head-to-toe assessment and targeted evaluation of new symptoms, reviewing actual imaging coverage.

C. Wait until outpatient follow-up because the dominant fracture was treated.

D. Assume the torso CT cleared both feet and every spinal concern.

Answer: B

Why this decision is best: An interrupted unreliable survey requires completion. New localizing symptoms and mechanism create specific unanswered questions.

Analysis of the options

A - Inferior in this scenario: A convenient explanation does not exclude a second injury.

B - Best answer: An interrupted unreliable survey requires completion. New localizing symptoms and mechanism create specific unanswered questions.

C - Inferior in this scenario: Some missed injuries require timely treatment before routine discharge.

D - Inferior in this scenario: Coverage and protocol matter; a torso summary is not a whole-body functional examination.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 62 | Secondary survey and missed injuries

A 29-year-old with a crush injury has rising analgesic needs, tense calf swelling and pain on passive toe stretch. The foot is warm with palpable pulses. Staff consider the tertiary survey complete because vascular observations were normal earlier. The patient has just returned from another procedure, and the next scheduled surgical round is several hours away. Orthopedic assessment can be requested immediately. The earlier normal pulse check describes arterial flow at that moment rather than pressure within every muscle compartment. Increasing pain despite treatment is a change that matters before systemic observations become abnormal. The clinician has access to appropriate assessment now. The question tests whether a reassuring sign or a completed checklist is being used to delay evaluation of a time-sensitive evolving limb threat. Select the single best next decision under the capabilities and constraints described. What is the best next step?

A. Treat preserved warmth as proof that compartment pressure is safe.

B. Request urgent compartment assessment now rather than wait for a routine survey or pulse loss.

C. Wait until pulses disappear before escalating.

D. Schedule reassessment for the next morning only.

Answer: B

Why this decision is best: Clinical concern for compartment syndrome is time-sensitive; pulses can remain present and earlier findings can become obsolete.

Analysis of the options

A - Inferior in this scenario: Warmth does not exclude compromised compartment perfusion.

B - Best answer: Clinical concern for compartment syndrome is time-sensitive; pulses can remain present and earlier findings can become obsolete.

C - Inferior in this scenario: Pulse loss can be a late finding and waiting risks irreversible injury.

D - Inferior in this scenario: A scheduled review does not replace urgent response to new evidence.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 63 | Secondary survey and missed injuries

A 63-year-old is extubated after emergency trauma surgery. The initial head-to-toe examination was limited and the operative handover lists several regions not examined. He now reports hand weakness and ankle pain. The team considers the tertiary survey unnecessary because CT was extensive and he was already seen by three specialties. No clinician has reconciled final reports or updated the injury list since surgery. The patient can now participate in testing that was impossible during sedation. Each specialty has concentrated on its own urgent problem, leaving the possibility of gaps between examinations. Final imaging interpretations are available but have not been reconciled. The practical task is to create one accountable whole-patient review rather than assume that a collection of partial assessments establishes diagnostic completeness. Select the single best next decision under the capabilities and constraints described. Which plan best addresses the risk?

A. Review only the operated region because other symptoms are less severe.

B. Wait for a new abnormal vital sign before reassessment.

C. Assign a formal repeat examination and investigation review, including previously untestable regions and new symptoms.

D. Assume multiple specialty reviews guarantee complete assessment.

Answer: C

Why this decision is best: Extubation restores a valuable examination opportunity. Ownership and reconciliation prevent gaps between specialties.

Analysis of the options

A - Inferior in this scenario: Severity of the treated lesion does not exclude other important injuries.

B - Inferior in this scenario: Neurological and peripheral injuries may occur without abnormal systemic observations.

C - Best answer: Extubation restores a valuable examination opportunity. Ownership and reconciliation prevent gaps between specialties.

D - Inferior in this scenario: Several partial examinations do not equal one coordinated complete review.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 64 | Secondary survey and missed injuries

A 50-year-old is transferred with a preliminary CT report of no acute vascular injury. A later addendum identifies an important abnormality needing specialist review. The referring and receiving teams each assume the other will act. The patient has already moved to a ward, and no acknowledgment appears in either record. A clinician is asked how to prevent this finding from disappearing during the transition. The addendum could change management even before symptoms become obvious. Sending an electronic document is useful but does not establish that a responsible clinician has seen its significance. The patient has crossed more than one team boundary. The safest process must identify the decision-maker, obtain acknowledgment and record what action follows, without relying on a general expectation that somebody will notice. Select the single best next decision under the capabilities and constraints described. What is the best response?

A. Communicate directly with a named responsible clinician, confirm receipt and document the resulting plan.

B. Assume electronic availability establishes clinical review.

C. Wait for the patient to develop symptoms before notification.

D. Place the addendum in the record without further action.

Answer: A

Why this decision is best: A critical result requires an accountable communication and action loop, not just transmission.

Analysis of the options

A - Best answer: A critical result requires an accountable communication and action loop, not just transmission.

B - Inferior in this scenario: Availability is not acknowledgment or management.

C - Inferior in this scenario: Delaying action until deterioration defeats the purpose of detecting the finding.

D - Inferior in this scenario: Passive filing does not establish that a decision-maker has seen the finding.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 65 | Secondary survey and missed injuries

A 35-year-old has two penetrating wounds across the lower chest and upper abdomen. He is initially stable. A trainee draws a straight line between them and concludes that the diaphragm and abdominal organs were avoided. The skin examination has not included the axilla or back, and wound labels are incomplete. Imaging and appropriate surgical assessment can be arranged without immediate instability. The patient is cooperative enough for an appropriate full examination and targeted studies. The wounds may not represent a simple paired entry and exit, and an unseen wound could alter interpretation further. Stable physiology provides an opportunity for deliberate evaluation rather than a reason to infer safety. The clinician must build a defensible injury assessment without creating additional damage during bedside investigation. Select the single best next decision under the capabilities and constraints described. Which approach is best?

A. Omit further assessment because pressure is stable.

B. Probe deeply at the bedside to establish the entire tract.

C. Accept the straight-line reconstruction as definitive anatomy.

D. Account systematically for all wounds and investigate plausible internal injury without assuming a simple external trajectory.

Answer: D

Why this decision is best: External sites do not reliably define internal path or pair every wound. Systematic exposure and targeted evaluation remain necessary.

Analysis of the options

A - Inferior in this scenario: Stability permits evaluation; it does not exclude important penetration.

B - Inferior in this scenario: Blind probing can add injury and does not safely establish all anatomy.

C - Inferior in this scenario: Projectile or penetrating trajectories need not match the assumed line.

D - Best answer: External sites do not reliably define internal path or pair every wound. Systematic exposure and targeted evaluation remain necessary.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 66 | Secondary survey and missed injuries

A 74-year-old after a fall has baseline hearing impairment and mild cognitive difficulty. He denies neck pain during a noisy assessment without his hearing device. Later his daughter reports new hand clumsiness and says he did not understand the earlier questions. The admission note labels the spine normal. The team is considering mobilization, but no reliable detailed neurological examination has been documented. The family can help clarify baseline function, and staff can improve the communication environment before repeating key tests. Mobilization should not be authorized from a negative finding whose reliability is now in doubt. The new complaint also has a neurological component rather than pain alone. The clinician must decide whether the earlier documentation reflects a valid assessment or an unresolved limitation requiring further evaluation. Select the single best next decision under the capabilities and constraints described. What is the most appropriate decision?

A. Accept the normal label because the patient verbally denied pain.

B. Force unrestricted neck movement to prove the absence of pain.

C. Treat the earlier assessment as limited and arrange reliable neurological/spinal reassessment before clearance decisions.

D. Attribute hand clumsiness to age without comparison to baseline.

Answer: C

Why this decision is best: Communication conditions undermine the earlier negative finding, and new functional change warrants targeted reassessment.

Analysis of the options

A - Inferior in this scenario: A response obtained without understanding may be unreliable.

B - Inferior in this scenario: Provocative movement is not a safe substitute for proper evaluation.

C - Best answer: Communication conditions undermine the earlier negative finding, and new functional change warrants targeted reassessment.

D - Inferior in this scenario: Collateral baseline suggests a potentially new deficit.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 67 | Secondary survey and missed injuries

A 47-year-old has abdominal bruising but no initial generalized tenderness. After analgesia and observation he develops increasing pain and guarding. The first CT was equivocal for mesenteric injury. The team plans to repeat imaging tomorrow as part of tertiary review. A surgeon now finds convincing peritonitis. Blood pressure is preserved, and the patient is not requiring escalating respiratory support. The patient has not become hypotensive, but peritonitis can establish an urgent abdominal problem before late systemic collapse. The earlier equivocal scan explains why observation was reasonable initially, not why observation must continue after the examination changes. The surgeon is being asked to respond to present evidence. A scheduled review point should be a safeguard rather than a barrier to earlier action. Select the single best next decision under the capabilities and constraints described. What is the best next decision?

A. Wait until tomorrow because tertiary review is designed to find delayed injuries.

B. Act on the current operative indication rather than postpone care to a scheduled survey or routine repeat scan.

C. Use stable pressure to exclude a surgical abdomen.

D. Require free air on another CT before any operation.

Answer: B

Why this decision is best: Current peritonitis can establish a need for exploration even when earlier imaging was uncertain and circulation remains stable.

Analysis of the options

A - Inferior in this scenario: Scheduled reassessment does not justify delay after an urgent finding emerges.

B - Best answer: Current peritonitis can establish a need for exploration even when earlier imaging was uncertain and circulation remains stable.

C - Inferior in this scenario: Contamination or ischemia may precede circulatory collapse.

D - Inferior in this scenario: An imaging sign is not mandatory when the clinical indication is established.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 68 | Secondary survey and missed injuries

A 56-year-old has unexplained persistent tachycardia after treatment of several fractures. He is afebrile, and the team attributes the pulse to pain without re-examining him. He has a new oxygen requirement and increasing chest discomfort. Earlier pleural findings were reassuring, but no examination has been repeated after transfer. The tertiary checklist is marked complete because the form was signed before surgery. New respiratory support needs create a primary-survey concern independent of whether a previously missed injury is eventually identified. The available clinician can reassess airway, breathing and circulation before pursuing more detailed tests. The trauma record must be interpreted as a sequence of observations rather than permanent clearance. The challenge is avoiding premature closure around pain when another explanation could be immediately dangerous. Select the single best next decision under the capabilities and constraints described. Which approach is best?

A. Increase analgesia and stop evaluation because pain explains tachycardia.

B. Wait for the next routine tertiary survey slot.

C. Reassess immediate threats and new symptoms now rather than rely on a completed form or one benign explanation.

D. Treat the signature as proof that no injury can have evolved.

Answer: C

Why this decision is best: New physiology and symptoms require renewed assessment; completed documentation is not a guarantee against evolving threats.

Analysis of the options

A - Inferior in this scenario: Pain can contribute without being the only cause.

B - Inferior in this scenario: A scheduled process cannot replace a response to deterioration.

C - Best answer: New physiology and symptoms require renewed assessment; completed documentation is not a guarantee against evolving threats.

D - Inferior in this scenario: The earlier form describes an earlier state and may have limitations.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 69 | Secondary survey and missed injuries

A 22-year-old has an injured dominant wrist after a collision. Attention focuses on chest injuries, and the wrist is not examined or imaged. On day two he cannot grip objects and has focal tenderness. The torso CT had no limb coverage. A trainee proposes documenting a normal hand examination retrospectively because no complaint was recorded initially, to avoid classifying the injury as missed. The functional complaint may affect long-term outcome even if it did not alter initial lifesaving priorities. The purpose of review is to find and treat such injuries, not to protect a favorable documentation label. The chronology should remain accurate. A transparent account of what was not examined and why permits better follow-up and useful system learning without changing the historical record. Select the single best next decision under the capabilities and constraints described. What is the most appropriate action?

A. Document the actual delayed finding honestly, assess it promptly and review the process gap without inventing earlier negatives.

B. Ignore the wrist because it did not threaten life initially.

C. Assume absence of an early complaint excludes injury.

D. Backfill a normal initial examination to make the record complete.

Answer: A

Why this decision is best: Accurate documentation and timely treatment matter more than protecting a label. An unexamined region cannot be reconstructed as normal.

Analysis of the options

A - Best answer: Accurate documentation and timely treatment matter more than protecting a label. An unexamined region cannot be reconstructed as normal.

B - Inferior in this scenario: Nonlethal injury can still cause major functional morbidity.

C - Inferior in this scenario: Distraction and limited participation can suppress early reporting.

D - Inferior in this scenario: Fabrication obscures both care needs and opportunities to improve the system.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 70 | Secondary survey and missed injuries

A 65-year-old is ready for transfer after stabilization. Several final imaging reports remain pending and one region was not examined because of a splint. The receiving team agrees to take the patient but has not been told about these limitations. Staff plan to write all tests normal to simplify handover. The patient is alert and can now describe new ankle pain that was absent from the initial notes. The patient can be transferred safely if outstanding nonblocking tasks have an accepted route to completion. The new ankle complaint may need examination now or a clearly communicated receiving plan, depending on urgency. The team must not manufacture certainty to simplify paperwork. The handover should make the next clinician's job easier by separating known findings from questions that still need an answer. Select the single best next decision under the capabilities and constraints described. Which handover is best?

A. Separate confirmed findings, pending reports and incomplete examination, naming who will resolve each item.

B. Summarize all pending information as normal to avoid confusion.

C. Omit the new pain because it was not present on arrival.

D. Delay transfer indefinitely until every possible test is complete.

Answer: A

Why this decision is best: A precise uncertainty list supports continuity without requiring unnecessary delay. New symptoms need an assigned assessment plan.

Analysis of the options

A - Best answer: A precise uncertainty list supports continuity without requiring unnecessary delay. New symptoms need an assigned assessment plan.

B - Inferior in this scenario: False certainty increases the risk that unresolved injuries are never evaluated.

C - Inferior in this scenario: Evolving or newly reportable symptoms are clinically relevant.

D - Inferior in this scenario: Transfer can proceed when safe with explicit responsibility for appropriate outstanding work.

Review: teaching domain 7; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 71 | Intervention, staging and nonoperative care

A 31-year-old at laparotomy has major bleeding and bowel injury. Initial control is achieved, but temperature is falling, coagulation is deteriorating and support requirements rise. Definitive reconstruction would be lengthy. The surgeon can provide safe temporary management and planned critical-care resuscitation with return to the operating room. A colleague urges completing every repair now to avoid a second anesthetic. The operation has reached a point where an abbreviated endpoint can be chosen deliberately rather than imposed by arrest. The team can document temporary anatomy and arrange continuing resuscitation. The benefit of an additional repair must be compared with its physiological cost. The decision is not whether completeness is desirable in general, but whether this patient can safely sustain it now. Select the single best next decision under the capabilities and constraints described. Which strategy is best?

A. Use a proportionate damage-control endpoint with explicit temporary measures and a return plan.

B. Complete prolonged reconstruction regardless of worsening physiology.

C. Use temporary closure but omit a reoperation plan until the patient is fully recovered.

D. Close immediately without ensuring hemorrhage and contamination are controlled.

Answer: A

Why this decision is best: The physiological cost of prolonged repair may exceed benefit. Staging requires adequate immediate control and accountable continuation.

Analysis of the options

A - Best answer: The physiological cost of prolonged repair may exceed benefit. Staging requires adequate immediate control and accountable continuation.

B - Inferior in this scenario: Avoiding another anesthetic does not justify ongoing physiological collapse.

C - Inferior in this scenario: Temporary management creates specific monitoring and definitive-treatment obligations.

D - Inferior in this scenario: Abbreviation is not permission to leave correctable immediate threats untreated.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 72 | Intervention, staging and nonoperative care

A 43-year-old has a limited operative injury, controlled bleeding and sustained physiological recovery. Definitive repair is straightforward and can be completed promptly. The surgeon proposes temporary closure solely because damage control is fashionable in major trauma. The patient has no stated physiological or anatomical reason to defer completion. The team can provide appropriate postoperative monitoring after either approach. The proposed staging would add another operation and temporary-abdomen risks without a stated compensating benefit. The patient's recent recovery should still be monitored, and any deterioration would change the plan. The surgeon must weigh actual duration and complexity rather than rely on a fashionable category. Both overuse and underuse of abbreviated surgery can expose patients to avoidable harm. Select the single best next decision under the capabilities and constraints described. What is the most appropriate choice?

A. Use an open abdomen for every patient classified as major trauma.

B. Prolong the operation to perform unrelated elective repairs.

C. Choose staging solely to standardize the surgeon's workflow.

D. Complete safe definitive repair when the injury and physiology permit rather than stage reflexively.

Answer: D

Why this decision is best: Damage control has morbidity and should solve a specific physiological or technical problem rather than become automatic.

Analysis of the options

A - Inferior in this scenario: Major-trauma status alone does not establish benefit from an open abdomen.

B - Inferior in this scenario: Safe definitive trauma repair does not justify unnecessary additional procedures.

C - Inferior in this scenario: Convenience is not a sufficient indication for added patient burden.

D - Best answer: Damage control has morbidity and should solve a specific physiological or technical problem rather than become automatic.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 73 | Intervention, staging and nonoperative care

A 55-year-old has ongoing arterial pelvic bleeding and also clear signs of bowel perforation. He is supportable with blood, and both interventional and operating teams are available. A clinician proposes embolization followed by ward observation because it can address the arterial source. The surgeon points out that bleeding control will not treat contamination. The team needs a coordinated sequence rather than two independent referrals. The two procedural teams can discuss timing and a shared destination before either begins. The arterial lesion is important, but addressing it does not make a contaminated abdomen safe for observation. The patient needs a plan for every major threat, including what happens if physiology worsens during setup. The decision should integrate interventions instead of allowing one successful procedure to close the entire case. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Perform whichever procedure is booked first without a shared plan.

B. Coordinate operative treatment of the abdominal threat with appropriate pelvic control, including endovascular treatment when useful.

C. Observe the perforation until hemorrhage alone causes instability.

D. Treat embolization as definitive management of all injuries.

Answer: B

Why this decision is best: Different lesions require complementary treatments. Sequence follows dominant threat and time to effective control.

Analysis of the options

A - Inferior in this scenario: Administrative order should not determine clinical priority.

B - Best answer: Different lesions require complementary treatments. Sequence follows dominant threat and time to effective control.

C - Inferior in this scenario: A serious abdominal indication remains even after pressure improves.

D - Inferior in this scenario: Arterial control does not repair bowel injury or contamination.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 74 | Intervention, staging and nonoperative care

A 46-year-old with a solid-organ injury remains stable after resuscitation. CT shows no immediate operative abdominal indication, and specialist review supports a nonoperative option. The ward has infrequent observations, no overnight surgical rescue and limited blood. A tertiary center with monitored care and intervention capability can accept an early supported transfer. The trainee considers normal pressure sufficient to remain locally. The patient could deteriorate after a period of apparent stability, and local detection or rescue might then be delayed. Early transport is feasible under present conditions. The choice is therefore not simply surgery versus no surgery, but which setting can safely deliver the selected pathway. Monitoring and rescue capability are part of treatment eligibility, not optional additions after the decision is made. Select the single best next decision under the capabilities and constraints described. Which plan is safest?

A. Operate solely because the local ward cannot observe well, without considering transfer.

B. Discharge with advice because the patient is currently stable.

C. Arrange care in a setting with appropriate monitoring and timely rescue rather than rely on unsupported local observation.

D. Use routine ward care because no operation is planned now.

Answer: C

Why this decision is best: Nonoperative treatment depends on system capability as well as anatomy and current physiology.

Analysis of the options

A - Inferior in this scenario: When safe early transfer exists, inadequate local observation does not automatically mandate surgery.

B - Inferior in this scenario: The injury still requires active surveillance and rescue planning.

C - Best answer: Nonoperative treatment depends on system capability as well as anatomy and current physiology.

D - Inferior in this scenario: A treatment choice does not remove the possibility of failure.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 75 | Intervention, staging and nonoperative care

A 32-year-old has temporary abdominal closure after hemorrhage and contamination control. Packs remain and bowel continuity is deferred. The patient is transferred to ICU. The handover says surgery completed and omits the pack count, deferred reconstruction and expected return. Overnight staff assume only routine postoperative care is needed. The surgeon is asked which information must be corrected before leaving. The receiving ICU team can manage staged care only if the residual anatomy and planned next steps are visible. A temporary closure can conceal unresolved reconstruction obligations even when the pressure initially improves. The surgeon should anticipate which findings require an urgent call or earlier return. The handover must describe the ongoing strategy rather than merely announce the end of the first procedure. Select the single best next decision under the capabilities and constraints described. What is the best handover correction?

A. Specify all temporary measures, current physiology, monitoring concerns and the planned definitive reassessment/return.

B. Wait until the next operation to identify what was deferred.

C. Document only the total blood loss.

D. Leave the note unchanged because the incision is covered.

Answer: A

Why this decision is best: Staged care requires a shared explicit plan; temporary measures create continuing risks and obligations.

Analysis of the options

A - Best answer: Staged care requires a shared explicit plan; temporary measures create continuing risks and obligations.

B - Inferior in this scenario: The next team needs this information before deterioration or delayed reoperation.

C - Inferior in this scenario: Blood loss alone does not communicate residual anatomy or tasks.

D - Inferior in this scenario: A covered wound is not proof of completed definitive treatment.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 76 | Intervention, staging and nonoperative care

A 60-year-old with a temporary vascular shunt has improved distal perfusion. The patient remains physiologically fragile with other injuries. A resident wants to call the limb treatment definitive because a pulse is present and remove the item from the injury list. No team has been assigned to monitor the shunt or arrange reconstruction. Specialist vascular care is available after coordinated transfer. The patient may require transfer before reconstruction, so both teams need the same understanding of the device and surveillance requirements. Restored distal flow is an important treatment response, but the technical bridge can fail. The timing and responsibility for definitive treatment must be clear before the patient leaves the current team. A successful immediate endpoint must not disappear from continuing care planning. Select the single best next decision under the capabilities and constraints described. What is the best plan?

A. Treat restored pulse as proof that no further vascular care is needed.

B. Delay all planning until the pulse disappears.

C. Maintain explicit monitoring and a timely definitive vascular plan, communicating the temporary nature of the shunt.

D. Remove monitoring to avoid disturbing the repair.

Answer: C

Why this decision is best: A shunt is a bridge. Perfusion restoration is valuable but does not eliminate thrombosis, failure or reconstruction needs.

Analysis of the options

A - Inferior in this scenario: Immediate function is not equivalent to durable definitive repair.

B - Inferior in this scenario: Waiting for failure sacrifices the purpose of staged rescue.

C - Best answer: A shunt is a bridge. Perfusion restoration is valuable but does not eliminate thrombosis, failure or reconstruction needs.

D - Inferior in this scenario: Monitoring detects threatened loss before irreversible ischemia.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 77 | Intervention, staging and nonoperative care

A 52-year-old receiving nonoperative care develops recurrent hypotension, rising support needs and increasing abdominal tenderness. The protocol lists a laboratory threshold that has not yet been reached. A trainee wants to continue observation until the next scheduled blood count. Operating and interventional teams can reassess now. Earlier imaging suggested one bleeding source but did not exclude evolving bowel injury. The protocol is intended to support early recognition and escalation, not prevent action before a particular result. The patient has already supplied multiple clinical warning signals. The senior team can evaluate whether bleeding, contamination or another mechanism now requires intervention. The decision must be updated from current evidence rather than treating the initial nonoperative choice as a permanent commitment. Select the single best next decision under the capabilities and constraints described. Which decision is best?

A. Use a pressor to satisfy the observation pressure target without review.

B. Wait for the laboratory threshold despite clinical deterioration.

C. Treat the trajectory as possible pathway failure and obtain immediate senior reassessment for intervention.

D. Continue observation because nonoperative care was selected initially.

Answer: C

Why this decision is best: Clinical failure can precede a single threshold. The plan must change when evidence changes.

Analysis of the options

A - Inferior in this scenario: Masking pressure does not treat bleeding or contamination.

B - Inferior in this scenario: Laboratory schedules cannot override new shock or abdominal concern.

C - Best answer: Clinical failure can precede a single threshold. The plan must change when evidence changes.

D - Inferior in this scenario: A treatment choice is conditional, not an irreversible commitment.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 78 | Intervention, staging and nonoperative care

A 40-year-old with an abdominal injury becomes more stable during surgery after rapid control. The remaining repair is technically straightforward, warming is effective and support requirements are decreasing. A trainee insists the initial hypotension means staging is mandatory. The surgeon considers completing repair but wants to avoid ignoring the earlier shock. There are no other unresolved injuries requiring immediate abbreviated transfer. The surgeon has contemporaneous information about reserve that was unavailable on arrival. Completing a short necessary repair may avoid the burdens of staging, while a long additional procedure could reverse the recovery. The decision must state why present conditions support the chosen endpoint and retain an alternative if physiology worsens. Neither a historical label nor optimism alone should determine the remaining operation. Select the single best next decision under the capabilities and constraints described. What is the best reasoning?

A. Use the arrival pressure alone to determine the entire operation.

B. Reassess present physiology and repair burden rather than make the initial pressure an automatic permanent staging rule.

C. Ignore the earlier shock and add lengthy nonessential reconstruction.

D. Leave uncontrolled contamination to shorten the operation regardless of recovery.

Answer: B

Why this decision is best: The operative endpoint is dynamic. Sustained recovery and a short necessary repair may support completion under expert judgment.

Analysis of the options

A - Inferior in this scenario: A historical snapshot does not replace intraoperative reassessment.

B - Best answer: The operative endpoint is dynamic. Sustained recovery and a short necessary repair may support completion under expert judgment.

C - Inferior in this scenario: Recovery does not justify unrelated added physiological burden.

D - Inferior in this scenario: Abbreviation must still achieve an appropriate immediate control endpoint.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 79 | Intervention, staging and nonoperative care

A 36-year-old is in ICU after damage-control laparotomy. Pressure initially improves but then falls, abdominal distension increases and transfusion requirements rise again. A relook was tentatively planned for tomorrow. The nurse asks whether the team should follow the scheduled time. A resident attributes all abnormalities to residual shock because the operation was labeled damage control and the patient is already in critical care. The postoperative course is not following the expected direction after effective control. A planned relook time provides a default for an improving patient, not permission to ignore failure before that time. The operative team should be involved while resuscitation continues. The surgeon must decide whether the new findings represent a correctable emergency rather than assume that intensive care can compensate indefinitely. Select the single best next decision under the capabilities and constraints described. What is the best next action?

A. Wait for the scheduled relook regardless of deterioration.

B. Urgently reassess for failed control or complication and consider earlier return rather than follow the calendar blindly.

C. Increase sedation and defer surgical notification.

D. Assume ICU admission means all operative threats are resolved.

Answer: B

Why this decision is best: The timing plan is conditional on trajectory. Recurrent shock and distension require renewed source-control judgment.

Analysis of the options

A - Inferior in this scenario: A scheduled time is not a prohibition against earlier rescue.

B - Best answer: The timing plan is conditional on trajectory. Recurrent shock and distension require renewed source-control judgment.

C - Inferior in this scenario: Suppressing signs without notifying the responsible team delays treatment.

D - Inferior in this scenario: Critical care supports but does not replace mechanical control.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 80 | Intervention, staging and nonoperative care

A 68-year-old has serious injuries but was independent before the event and has a reversible bleeding lesion. The family reports an order declining CPR. One clinician interprets this as a refusal of transfusion and operation. Another wants to ignore all preferences during trauma care. The patient can briefly communicate and asks what treatment is proposed. Immediate control is feasible with appropriate support. The patient can express a view about reversible injury treatment, and the family can clarify the existing document. There is enough opportunity for focused explanation without abandoning immediate support. The team's task is to distinguish specific treatment preferences from broad assumptions. Proportionality should include expected benefit, burden and functional context, while avoiding either age-based exclusion or disregard of a capable person's wishes. Select the single best next decision under the capabilities and constraints described. What is the best approach?

A. Clarify the patient's wishes and the actual scope of limitations while treating indicated reversible threats within the agreed plan.

B. Assume a no-CPR order prohibits every invasive treatment.

C. Ignore a capable patient's expressed preferences because the injury is traumatic.

D. Declare treatment futile solely from age.

Answer: A

Why this decision is best: Treatment proportionality requires individualized prognosis and actual preferences, not broad inference from one order.

Analysis of the options

A - Best answer: Treatment proportionality requires individualized prognosis and actual preferences, not broad inference from one order.

B - Inferior in this scenario: CPR limitations do not automatically prohibit surgery or blood.

C - Inferior in this scenario: Urgency does not erase decision-making rights when meaningful participation is possible.

D - Inferior in this scenario: Chronological age alone does not establish futility.

Review: teaching domain 8; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 81 | Transfer and limited resources

A 27-year-old at a small hospital has persistent hemorrhagic shock, a distended abdomen and positive FAST. The local surgical and anesthesia teams can begin lifesaving control promptly. Specialist transport would take 90 minutes and cannot control abdominal bleeding en route. The receiving center agrees to coordinate. A trainee recommends immediate departure because every major injury belongs at a trauma center, even before local control. The local team is not expected to perform every specialist reconstruction, but can address the immediate threat within its competence. The receiving surgeon can help plan a staged endpoint and subsequent destination. The patient needs a realistic comparison between time to local control and time spent bleeding during transport. Early referral and essential local intervention are not mutually exclusive strategies. Select the single best next decision under the capabilities and constraints described. Which decision best balances the risks?

A. Perform necessary available local lifesaving control while maintaining specialist coordination and planning subsequent supported transfer.

B. Depart immediately regardless of uncontrolled collapse.

C. Delay all action until the receiving surgeon arrives physically.

D. Attempt a prolonged complex reconstruction beyond local capability.

Answer: A

Why this decision is best: The patient may not survive the journey without control. Early referral and essential local treatment can be complementary.

Analysis of the options

A - Best answer: The patient may not survive the journey without control. Early referral and essential local treatment can be complementary.

B - Inferior in this scenario: A preferred destination does not negate an immediate available lifesaving intervention.

C - Inferior in this scenario: Remote coordination can support action without waiting for physical arrival.

D - Inferior in this scenario: A proportionate control endpoint is safer than exceeding expertise during severe shock.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 82 | Transfer and limited resources

A 45-year-old has a stable vascular injury requiring expertise unavailable locally. Appropriate airway and circulation support are established, images are transferable and the receiving surgeon has accepted. A clinician wants additional local studies that will not change pretransfer care. The extra tests would miss the available critical-care transport window. No immediate local procedure is indicated. The proposed tests would provide additional detail rather than change immediate support, transport readiness or receiving capability. Images and the current injury list can travel with the patient. The team should retain contingency planning for any change before departure. The clinician must decide whether the local work adds patient benefit or merely satisfies a desire for completeness at the cost of definitive-care delay. Select the single best next decision under the capabilities and constraints described. What is the most appropriate plan?

A. Complete the local diagnostic inventory before any transfer.

B. Transfer without images because the destination has better scanners.

C. Proceed with supported transfer and a precise handover rather than delay for nonessential local completion.

D. Cancel referral because current observations are acceptable.

Answer: C

Why this decision is best: Definitive capability is missing and the patient is currently supportable. The opportunity should not be lost to nonactionable testing.

Analysis of the options

A - Inferior in this scenario: Local completeness is not the endpoint when delay offers no immediate benefit.

B - Inferior in this scenario: Existing information reduces repetition and helps receiving preparation.

C - Best answer: Definitive capability is missing and the patient is currently supportable. The opportunity should not be lost to nonactionable testing.

D - Inferior in this scenario: Stable physiology does not supply the required expertise.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 83 | Transfer and limited resources

A 59-year-old accepted for transfer develops new respiratory distress and falling pressure just before departure. Earlier observations were stable. The ambulance is waiting and the receiving bed may be reassigned if delayed. A resident proposes departing because acceptance has already been documented. The local team has skilled airway and pleural rescue capability and can urgently reassess the patient. The change occurred after the original acceptance decision and therefore was not part of the prior transport assessment. The team can treat immediately reversible causes locally and notify the receiving service of altered requirements. A short purposeful pause may be lifesaving, whereas administrative urgency can create avoidable harm. The revised decision must reflect the patient who exists now, not the earlier booking. Select the single best next decision under the capabilities and constraints described. What should happen now?

A. Pause departure, reassess immediate threats and update transport and receiving teams before deciding the revised route.

B. Ignore the change unless pressure falls below an arbitrary single threshold.

C. Depart because acceptance establishes transport safety.

D. Complete paperwork before reassessment.

Answer: A

Why this decision is best: Transport eligibility is dynamic; a new threat may require local lifesaving treatment and a changed support plan.

Analysis of the options

A - Best answer: Transport eligibility is dynamic; a new threat may require local lifesaving treatment and a changed support plan.

B - Inferior in this scenario: The trajectory and clinical threat matter before one threshold is reached.

C - Inferior in this scenario: A destination decision is not physiological clearance.

D - Inferior in this scenario: Administrative completion cannot precede an acute clinical response.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 84 | Transfer and limited resources

A 33-year-old needs transfer after temporary bleeding control. He has a secured airway, chest drain and ongoing blood support. The escort lacks competence to manage ventilation failure, and no blood supply for the journey has been arranged. Staff want to leave promptly because transfer delay is harmful. A suitably skilled team can be mobilized, and local resuscitation continues during preparation. The transport team needs a credible plan for foreseeable oxygenation, ventilation and circulatory problems over the entire route. Local care can continue while the correct resources are assembled. The point is not achieving zero risk, but avoiding a journey in which ordinary anticipated deterioration cannot be managed. The leader must turn the transfer decision into an executable clinical plan rather than just an urgent request. Select the single best next decision under the capabilities and constraints described. Which choice best reflects appropriate urgency?

A. Arrange the support and competent escort required for a realistic journey while avoiding unnecessary delay.

B. Remove the drain to simplify the journey.

C. Wait for every laboratory value to normalize before requesting transport support.

D. Depart with any available escort because speed overrides all transport needs.

Answer: A

Why this decision is best: Urgency requires efficient preparation, not unsupported exposure to foreseeable failure. Escort capability must match the patient's needs.

Analysis of the options

A - Best answer: Urgency requires efficient preparation, not unsupported exposure to foreseeable failure. Escort capability must match the patient's needs.

B - Inferior in this scenario: Removing a needed functioning device can recreate an untreated threat.

C - Inferior in this scenario: Perfect normalization may be impossible before definitive treatment.

D - Inferior in this scenario: Unmanaged airway or circulatory failure can make fast departure unsafe.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 85 | Transfer and limited resources

A 71-year-old has a significant head injury and controlled external bleeding. The local hospital lacks neurosurgery but has CT. He is supportable, and the receiving specialist says a rapid local study will determine the destination and operative preparation without missing transport. Another clinician insists that no test should ever precede transfer. The team can maintain monitoring and has a contingency for deterioration. The receiving service has explained exactly how the scan will alter immediate preparation and location of treatment. The patient remains under close support, and an exit plan exists if the response changes. The investigation has a concrete pretransfer purpose. The judgment should compare useful information with actual delay rather than apply an inflexible rule that every local test is either necessary or harmful. Select the single best next decision under the capabilities and constraints described. Which reasoning is best?

A. Apply an absolute rule against every local investigation.

B. Complete all possible studies before discussing the result.

C. Cancel transfer if pressure remains normal after scanning.

D. Obtain the decision-changing study if supportable and timely, while continuing referral and transport coordination.

Answer: D

Why this decision is best: The value of a local study depends on its effect on immediate destination/treatment and its time cost.

Analysis of the options

A - Inferior in this scenario: Transfer efficiency is not a ban on useful decision-directed testing.

B - Inferior in this scenario: One useful test does not justify unrelated delay.

C - Inferior in this scenario: The need for specialist care can persist despite stable systemic observations.

D - Best answer: The value of a local study depends on its effect on immediate destination/treatment and its time cost.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 86 | Transfer and limited resources

A 48-year-old is transferred after a staged operation. The receiving team knows the diagnosis but not that packs remain, a vascular shunt is temporary and bowel continuity is deferred. Only the medication chart accompanies the patient. Current pressure is acceptable with support. A receiving clinician proposes routine ward placement because the referral says postoperative stable. The operative surgeon is reachable by telephone. The operative findings may require ICU-level surveillance and a planned early return even when current circulation is acceptable. The surgeon's verbal clarification can be obtained before the written record arrives. The patient also needs a repeat immediate assessment after transport. Placement should follow actual temporary measures and support requirements, not the reassuring shorthand used in an incomplete referral summary. Select the single best next decision under the capabilities and constraints described. What is the best immediate step?

A. Obtain direct operative clarification and place the patient according to staged-care needs while reassessing physiology.

B. Wait for the written record to arrive before asking about temporary measures.

C. Assume all operative steps were definitive unless deterioration proves otherwise.

D. Accept the stable label as sufficient for routine ward care.

Answer: A

Why this decision is best: Temporary anatomy and support needs determine monitoring and next interventions; direct clarification closes an urgent gap.

Analysis of the options

A - Best answer: Temporary anatomy and support needs determine monitoring and next interventions; direct clarification closes an urgent gap.

B - Inferior in this scenario: Telephone clarification can prevent unsafe placement now.

C - Inferior in this scenario: Assumption can delay planned reconstruction or detection of failure.

D - Inferior in this scenario: A vague label conceals substantial residual risk.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 87 | Transfer and limited resources

A 54-year-old with a pelvic injury is at a hospital where embolization will not be available for hours. He is requiring accelerating blood support. The operating team can perform the local pelvic-control pathway, and referral has begun. A clinician wants to wait for the preferred endovascular option because it is less invasive, despite continuing physiological decline. Another assumes transfer alone is immediate treatment. The patient is not demonstrating a sustained recovery during the expected waiting period. A technically appealing treatment that cannot be delivered soon may be inferior to an immediately effective available pathway. Specialist coordination can retain later embolization if required. The decision must compare time to benefit, not simply invasiveness, and must remain responsive to the trajectory during preparation. Select the single best next decision under the capabilities and constraints described. Which decision is most appropriate?

A. Send the patient without considering an available lifesaving local intervention.

B. Wait for embolization regardless of the delay.

C. Choose the fastest achievable effective control strategy, coordinating local and receiving expertise rather than waiting passively.

D. Use the less invasive label as the only selection criterion.

Answer: C

Why this decision is best: Actual time to control and physiology matter more than the procedure label. Complementary approaches may be needed.

Analysis of the options

A - Inferior in this scenario: A journey cannot replace a necessary immediate intervention when collapse is progressing.

B - Inferior in this scenario: An unavailable treatment does not control bleeding now.

C - Best answer: Actual time to control and physiology matter more than the procedure label. Complementary approaches may be needed.

D - Inferior in this scenario: Less invasive is not automatically safer when delay is lethal.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 88 | Transfer and limited resources

A 30-year-old has severe injuries and the receiving hospital initially has no bed. Blood support and essential treatment are underway. The local team becomes frustrated and stops referral calls, planning to continue indefinitely despite missing specialist capability. A regional coordination service and alternative centers are available. The patient remains supportable but could deteriorate, and transport arrangements require advance notice. The local team still owns care until a safe handover is achieved. Regional coordination can help match need, capability and transport rather than repeatedly calling without a plan. The patient may need a different destination or a retrieval arrangement. The clinician must treat a system obstacle as a problem requiring escalation and alternatives, without suspending essential local lifesaving actions. Select the single best next decision under the capabilities and constraints described. What is the best system-level action?

A. Suspend treatment until a bed is confirmed.

B. Stop seeking definitive capability after one refusal.

C. Transfer without any receiving agreement to a randomly selected center.

D. Escalate through regional coordination and alternative appropriate destinations while continuing local lifesaving care.

Answer: D

Why this decision is best: A failed first referral requires an alternative coordinated route, not abandonment of either treatment or definitive planning.

Analysis of the options

A - Inferior in this scenario: Care must continue while placement is arranged.

B - Inferior in this scenario: One unavailable destination does not resolve the capability gap.

C - Inferior in this scenario: Uncoordinated destination choice can create further delays and unsupported arrival.

D - Best answer: A failed first referral requires an alternative coordinated route, not abandonment of either treatment or definitive planning.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 89 | Transfer and limited resources

A 66-year-old is being transferred with several pending reports. Both teams agree that departure should not wait because no result is expected to alter immediate transport. However, no one has accepted responsibility for checking the final interpretations. The referring clinician assumes the electronic system will notify someone. The receiving clinician has not received access credentials or the study identifiers. The receiving service can accept a clearly defined review task if the identifiers, contact route and urgency are communicated. The test results are not currently required to make the transport safe, so indefinite delay offers little benefit. The missing element is accountable follow-through. The team must distinguish a permissible pending result from a result that has effectively been abandoned between institutions. Select the single best next decision under the capabilities and constraints described. What is the best solution?

A. Assign named result-review responsibility and a direct communication route for any changed finding.

B. Delay transfer indefinitely solely because reports are pending.

C. Delete pending items from the summary to simplify care.

D. Treat electronic transmission as proof of review.

Answer: A

Why this decision is best: Safe transfer can coexist with unresolved nonblocking results only when ownership and action routes are explicit.

Analysis of the options

A - Best answer: Safe transfer can coexist with unresolved nonblocking results only when ownership and action routes are explicit.

B - Inferior in this scenario: A solvable communication gap need not force unnecessary delay.

C - Inferior in this scenario: Removing uncertainty from the summary does not remove it from the patient.

D - Inferior in this scenario: Transmission does not ensure acknowledgment or interpretation.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 90 | Transfer and limited resources

A 41-year-old is stable after temporary treatment and requests transfer by private car to a preferred hospital. He still needs oxygen, a chest drain and repeated reassessment. He understands some but not all proposed risks, and severe pain distracts him. The receiving facility is willing to accept with medical transport. The team must respect preferences while explaining why the proposed mode may be unsafe. The patient should be helped to understand how oxygen, drainage and deterioration monitoring would be maintained during a medical journey and what would be absent in a private vehicle. Capacity must be assessed for this specific choice. The team can treat pain and communicate clearly without assuming either automatic incapacity or automatic informed refusal from one statement. Select the single best next decision under the capabilities and constraints described. Which approach is most appropriate?

A. Agree to private transport solely because the destination is acceptable.

B. Assess understanding/capacity, explain specific risks and arrange an appropriate supported route while discussing his preferences.

C. Assume pain automatically removes all decision-making capacity.

D. Restrain him without attempting communication because trauma patients cannot refuse.

Answer: B

Why this decision is best: A supported informed decision requires individualized capacity assessment and concrete explanation of transport risks.

Analysis of the options

A - Inferior in this scenario: A suitable hospital does not make an unsupported journey suitable.

B - Best answer: A supported informed decision requires individualized capacity assessment and concrete explanation of transport risks.

C - Inferior in this scenario: Pain can affect assessment but is not an automatic categorical incapacity.

D - Inferior in this scenario: Urgency does not remove the need for proportionate lawful patient-centered decision-making.

Review: teaching domain 9; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 91 | Special populations and integrated judgment

An 82-year-old taking apixaban and a beta blocker falls from standing. Pressure is 112/68 with pulse 70, compared with usual systolic readings near 165. She has new confusion, cool hands and enlarging flank bruising. INR is 1.1 and FAST is negative. The resident proposes routine fracture care. Her daughter reports independent baseline function and an advance order declining CPR, but not surgery or blood. The normal INR has been interpreted as if it were a sensitive measure of every anticoagulant effect. The baseline pressure difference and cognitive change have not been integrated into the triage decision. The patient's prior independence and actual treatment preferences are important to proportional care. The team must correct both physiological under-recognition and an unwarranted inference from the CPR limitation. Select the single best next decision under the capabilities and constraints described. What is the best integrated response?

A. Limit all treatment solely because of age and the CPR order.

B. Wait for marked tachycardia before activating trauma resources.

C. Exclude bleeding because INR and FAST are reassuring.

D. Evaluate occult shock and injury, clarify anticoagulant exposure and actual preferences, and escalate reversible threats appropriately.

Answer: D

Why this decision is best: Medication effects and relative hypotension can hide shock; neither tests nor age justify dismissing a reversible emergency.

Analysis of the options

A - Inferior in this scenario: The actual limitation and prognosis require clarification rather than assumption.

B - Inferior in this scenario: Beta blockade can blunt this warning sign.

C - Inferior in this scenario: Routine coagulation results and FAST do not exclude every relevant bleeding mechanism.

D - Best answer: Medication effects and relative hypotension can hide shock; neither tests nor age justify dismissing a reversible emergency.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 92 | Special populations and integrated judgment

A 29-year-old at 30 weeks of pregnancy has abdominal tenderness and worsening perfusion after a collision. FAST is negative and fetal cardiac activity is present. The family asks to avoid CT. A clinician proposes waiting several hours for MRI while fetal observation continues. Maternal pressure is falling, and local operating and diagnostic capability are available with obstetric support. Transfer to neonatal specialist care would take over an hour. The patient may have an obstetric complication, a maternal traumatic lesion or both. A brief fetal finding does not answer those questions or protect maternal circulation. The team can explain risks while treating the immediate threat and involving obstetrics. The choice between supportable imaging, urgent control and later transfer should follow the maternal trajectory and real available capability rather than fear alone. Select the single best next decision under the capabilities and constraints described. Which plan best balances the threats?

A. Transfer immediately for neonatal capability without reassessing maternal tolerance.

B. Wait for MRI solely to avoid radiation regardless of maternal trajectory.

C. Prioritize maternal resuscitation and indicated diagnosis/control with coordinated obstetric assessment and counseling.

D. Delay maternal evaluation because fetal cardiac activity is present.

Answer: C

Why this decision is best: Maternal rescue is central to fetal outcome. Imaging or control follows the urgent maternal question and physiology.

Analysis of the options

A - Inferior in this scenario: The journey may be unsafe without addressing the immediate maternal threat.

B - Inferior in this scenario: Radiation concern should not prevent medically indicated urgent diagnosis.

C - Best answer: Maternal rescue is central to fetal outcome. Imaging or control follows the urgent maternal question and physiology.

D - Inferior in this scenario: Fetal activity is not proof of maternal stability.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 93 | Special populations and integrated judgment

A 9-year-old after a collision is pale, restless and cool, with an age-appropriate pressure still in the normal range. The pulse is elevated and refill is delayed. The adult-oriented team considers shock excluded because the systolic pressure exceeds 90. Equipment and blood preparation have not been adjusted for weight. Pediatric expertise is available by immediate consultation, and significant injury remains possible. The child's preserved pressure may reflect compensation rather than adequate circulating reserve. The team can obtain weight or a suitable emergency estimate and use pediatric resources while evaluating injury. Delaying adaptation until decompensation risks rushed dosing and equipment errors. The clinician must recognize that the same monitor value can carry a different meaning at a different age and stage of shock. Select the single best next decision under the capabilities and constraints described. What is the best action?

A. Give fixed adult drug and transfusion doses to avoid calculation delay.

B. Use age-appropriate perfusion assessment and weight-based preparation while urgently evaluating the source and involving pediatric expertise.

C. Wait until hypotension appears before escalation.

D. Apply the adult pressure cutoff as definitive exclusion of shock.

Answer: B

Why this decision is best: Children may maintain pressure despite significant compromise. Physiological interpretation and treatment logistics must be adapted early.

Analysis of the options

A - Inferior in this scenario: Adult dosing can cause major error.

B - Best answer: Children may maintain pressure despite significant compromise. Physiological interpretation and treatment logistics must be adapted early.

C - Inferior in this scenario: Waiting for decompensation makes rescue harder.

D - Inferior in this scenario: One adult threshold does not establish pediatric perfusion adequacy.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 94 | Special populations and integrated judgment

A 12-year-old is alert and stable after blunt trauma with localized symptoms. An adult whole-body CT package is selected automatically because the mechanism was dramatic. The pediatric radiologist requests clinical examination and region-specific questions to limit the study appropriately. No immediate life-threatening indication requires bypassing assessment. The family asks whether a selective strategy would mean neglecting possible injuries. The family should hear that selective imaging still includes a plan for repeat examination and escalation if symptoms evolve. A targeted strategy is based on pediatric risk and the clinical question rather than reassurance alone. The available radiologist can tailor the protocol. The decision must avoid both unnecessary adult-style acquisition and a categorical refusal to use CT when an important injury is suspected. Select the single best next decision under the capabilities and constraints described. Which explanation and plan are best?

A. Perform every adult CT region solely from the mechanism.

B. Use pediatric injury-directed assessment and indicated targeted imaging rather than routine adult pan-scanning.

C. Avoid all CT in children regardless of injury concern.

D. Use a negative FAST as complete clearance for discharge.

Answer: B

Why this decision is best: Selective pediatric imaging reduces unnecessary exposure while preserving indicated diagnosis; mechanism informs rather than dictates coverage.

Analysis of the options

A - Inferior in this scenario: A dramatic mechanism does not establish the need for every adult acquisition.

B - Best answer: Selective pediatric imaging reduces unnecessary exposure while preserving indicated diagnosis; mechanism informs rather than dictates coverage.

C - Inferior in this scenario: Selective use is not a prohibition when CT is clinically needed.

D - Inferior in this scenario: Focused ultrasound cannot exclude all clinically important injuries.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 95 | Special populations and integrated judgment

A 26-year-old at 28 weeks of pregnancy has a minor collision and reassuring initial maternal assessment. She has a viable pregnancy and no admission-requiring injury identified, but formal obstetric observation has not occurred. The team plans immediate discharge after a single fetal heart check. Obstetric services can monitor her, and no urgent maternal treatment is pending. She asks why observation is necessary if she feels well. The absence of a currently identified maternal injury does not answer every question about evolving uterine or fetal complications. Obstetric services can define monitoring and escalation criteria without delaying urgent trauma treatment, since none is pending. The recommendation is conditional and should be applied in context. The patient deserves a clear explanation of what observation adds beyond a single reassuring measurement. Select the single best next decision under the capabilities and constraints described. Which plan is most appropriate?

A. Use the negative trauma evaluation to exclude all later obstetric complications.

B. Require a fixed prolonged admission for every pregnancy regardless of findings.

C. Discharge solely from the first fetal heart assessment.

D. Arrange formal maternal/fetal observation through the obstetric pathway rather than discharge after one brief check.

Answer: D

Why this decision is best: A reassuring snapshot does not replace appropriate observation. EAST 2025 conditionally supports at least 4-6 hours in viable pregnancies, with escalation when concerns arise.

Analysis of the options

A - Inferior in this scenario: Maternal injury assessment and obstetric surveillance answer overlapping but different questions.

B - Inferior in this scenario: Duration should reflect findings and the applicable pathway, not an unqualified universal admission rule.

C - Inferior in this scenario: A brief check can miss evolving obstetric problems.

D - Best answer: A reassuring snapshot does not replace appropriate observation. EAST 2025 conditionally supports at least 4-6 hours in viable pregnancies, with escalation when concerns arise.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 96 | Special populations and integrated judgment

A 58-year-old taking an unknown blood thinner has major traumatic bleeding and renal impairment. PT/INR and aPTT are not markedly abnormal. Family can contact his pharmacy, but the team wants a single universal reversal product without determining the drug. Mechanical control and transfusion are already being arranged. A specialist can advise while medication reconciliation proceeds, and the last dose remains uncertain. The team can contact pharmacy and specialist support while maintaining blood delivery and procedural preparation. Renal impairment may change the persistence of some agents, making the last dose particularly relevant. The decision must not reduce all anticoagulant exposure to one laboratory value or one antidote. It also must not make medication certainty a prerequisite for treatment of an established bleeding emergency. Select the single best next decision under the capabilities and constraints described. Which approach is best?

A. Resolve agent/exposure urgently and use current agent-specific reversal guidance alongside source control.

B. Assume normal routine tests exclude clinically relevant exposure.

C. Delay all hemorrhage treatment until a pharmacy record arrives.

D. Give the same antidote for every possible anticoagulant.

Answer: A

Why this decision is best: Drug identity, timing and renal function affect relevance and reversal. Expert reconciliation proceeds in parallel with rescue.

Analysis of the options

A - Best answer: Drug identity, timing and renal function affect relevance and reversal. Expert reconciliation proceeds in parallel with rescue.

B - Inferior in this scenario: Routine tests are not equally sensitive to all agents.

C - Inferior in this scenario: Mechanical and circulatory treatment cannot wait for complete medication certainty.

D - Inferior in this scenario: Different anticoagulants require different strategies.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 97 | Special populations and integrated judgment

A 37-year-old intoxicated after assault has reduced interaction and facial bruising. Staff attribute the findings to alcohol and propose observation without an adequate primary survey or glucose check. Oxygen requirement rises during the next half-hour. The history is incomplete and no reliable baseline exists. Airway, chest and neurological reassessment are available immediately, and no contraindication to injury-directed investigation has been established. The new oxygen requirement is evidence that the clinical state has changed while the team has remained attached to its original explanation. Glucose, perfusion, ventilation and structural injury questions remain open. The patient cannot reliably exclude symptoms through history. The clinician should treat uncertainty as a reason for structured reassessment and appropriate investigation, not as proof that observation without evaluation is sufficient. Select the single best next decision under the capabilities and constraints described. What is the best next action?

A. Use intoxication as a sufficient explanation for all neurological findings.

B. Discharge if the patient briefly responds to voice.

C. Reassess immediate threats and reversible causes while continuing injury evaluation despite intoxication.

D. Wait until sobriety before evaluating new physiology.

Answer: C

Why this decision is best: Intoxication is a confounder and possible coexisting condition, not an exclusion of hypoxemia, shock or structural injury.

Analysis of the options

A - Inferior in this scenario: One plausible contributor does not explain away new respiratory change.

B - Inferior in this scenario: A transient response does not establish safety or a completed assessment.

C - Best answer: Intoxication is a confounder and possible coexisting condition, not an exclusion of hypoxemia, shock or structural injury.

D - Inferior in this scenario: Waiting leaves potentially lethal causes untreated.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 98 | Special populations and integrated judgment

A 70-year-old with obesity and multiple injuries needs CT and transfer. The team has not checked scanner capacity, trolley limits or whether the available escort can move him safely. Prior failed access attempts have delayed blood delivery. The patient is currently supportable but remains at risk. A trainee suggests proceeding with the standard plan and resolving equipment problems only if they occur. The patient's current supportable state offers an opportunity to plan rather than discover an equipment failure in a corridor or scanner. Access and safe movement are already affecting treatment. The team should identify the nearest workable diagnostic and definitive-care route, including alternatives. The relevant issue is adapting logistics to deliver timely care, not postponing necessary assessment because it is technically inconvenient. Select the single best next decision under the capabilities and constraints described. Which plan is best?

A. Assume all equipment and protocols fit every patient.

B. Delay all care until weight-related logistics are perfect.

C. Choose no investigation because examination is technically difficult.

D. Anticipate equipment, access, positioning and transport needs now while preserving timely treatment and a fallback route.

Answer: D

Why this decision is best: Logistical constraints can become clinical hazards; early preparation reduces failed transfers and treatment interruption.

Analysis of the options

A - Inferior in this scenario: Standardization does not remove physical capacity limits.

B - Inferior in this scenario: Preparation should occur alongside care rather than create indefinite delay.

C - Inferior in this scenario: Difficult assessment increases the need for a workable diagnostic strategy.

D - Best answer: Logistical constraints can become clinical hazards; early preparation reduces failed transfers and treatment interruption.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 99 | Special populations and integrated judgment

A 6-year-old has injuries that do not fit the reported mechanism or developmental ability. The caregiver becomes defensive and asks staff to stop documenting bruises. The child also has an urgent respiratory problem. One clinician wants an immediate detailed accusatory interview before treatment; another wants to avoid safeguarding concerns to preserve cooperation. A pediatric and safeguarding team can be contacted while resuscitation proceeds. The child needs immediate physiological care regardless of how the history is ultimately understood. Objective documentation, appropriate photographs or examinations through the local pathway, and specialist coordination can preserve important information. Staff should avoid both suppressing concern and conducting uncontrolled repeated interviews. The judgment must protect urgent clinical needs and longer-term safety without turning the resuscitation into an adversarial investigation. Select the single best next decision under the capabilities and constraints described. What is the best response?

A. Conduct repeated leading interviews by every team member.

B. Omit concerning findings to maintain rapport.

C. Treat immediate threats, document objective findings and activate appropriate safeguarding assessment with careful communication.

D. Delay respiratory treatment until the caregiver's account is disproved.

Answer: C

Why this decision is best: Urgent care and safeguarding can proceed together; objective documentation and coordinated specialist assessment protect the child.

Analysis of the options

A - Inferior in this scenario: Repeated leading questioning can compromise both welfare and information quality.

B - Inferior in this scenario: Suppressing relevant findings undermines safety and accurate assessment.

C - Best answer: Urgent care and safeguarding can proceed together; objective documentation and coordinated specialist assessment protect the child.

D - Inferior in this scenario: An investigation cannot take priority over a life-threatening physiological problem.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Question 100 | Special populations and integrated judgment

A 49-year-old has simultaneous head, pelvic and limb injuries. Blood pressure is temporarily improved, but transfusion needs rise, one pupil changes and distal limb perfusion worsens. CT is remote, interventional radiology is delayed and the operating team is ready. Specialists propose different priorities, while the leader is asked to approve a fixed sequence of CT, embolization and later surgery based on the initial stable snapshot. The leader has to compare several time-sensitive risks while avoiding a false promise that one intervention will resolve all injuries. Each specialist needs the current support trajectory and the consequences of waiting. The plan should name the immediate action, remaining threats and the trigger for changing sequence. Consensus is valuable only when it remains connected to current physiology and achievable treatment. Select the single best next decision under the capabilities and constraints described. Which leadership decision best demonstrates integrated judgment?

A. Follow the original sequence because multiple teams have already agreed.

B. Wait for one diagnosis to explain all abnormalities before acting.

C. Re-synthesize current threats, coordinate the fastest achievable control/rescue sequence and state reassessment and failure triggers.

D. Choose the most technically attractive procedure without considering delay.

Answer: C

Why this decision is best: The plan must follow current physiology, irreversible-risk timing and real capability. Competing threats require shared prioritization and a revisable sequence.

Analysis of the options

A - Inferior in this scenario: Agreement based on obsolete information does not justify continued delay.

B - Inferior in this scenario: Multiple mechanisms may coexist, and complete explanatory certainty may be unattainable before rescue.

C - Best answer: The plan must follow current physiology, irreversible-risk timing and real capability. Competing threats require shared prioritization and a revisable sequence.

D - Inferior in this scenario: Technical appeal is not a measure of timely patient benefit.

Review: teaching domain 10; consult the related detailed chapter sections and the integrated review, pp. 81-87.

Compact answer key | Questions 1-50

Question	Answer	Question	Answer
1	A	26	A
2	B	27	A
3	D	28	A
4	B	29	C
5	D	30	C
6	B	31	D
7	B	32	D
8	A	33	B
9	C	34	D
10	C	35	D
11	B	36	A
12	B	37	D
13	B	38	D
14	C	39	B
15	C	40	D
16	D	41	B
17	C	42	C
18	A	43	D
19	D	44	B
20	C	45	D
21	D	46	C
22	A	47	A
23	D	48	C
24	A	49	C
25	B	50	B

Use the explanations to assess the reasoning, not just the selected letter. A correct response based on an unsafe rationale still deserves review. Revisit any assumption about stability, source control, examination reliability or rescue capability that differs from the scenario.

Compact answer key | Questions 51-100

Question	Answer	Question	Answer
51	D	76	C
52	A	77	C
53	B	78	B
54	B	79	B
55	A	80	A
56	A	81	A
57	D	82	C
58	C	83	A
59	D	84	A
60	B	85	D
61	B	86	A
62	B	87	C
63	C	88	D
64	A	89	A
65	D	90	B
66	C	91	D
67	B	92	C
68	C	93	B
69	A	94	B
70	A	95	D
71	A	96	A
72	D	97	C
73	B	98	D
74	C	99	C
75	A	100	C

Use the explanations to assess the reasoning, not just the selected letter. A correct response based on an unsafe rationale still deserves review. Revisit any assumption about stability, source control, examination reliability or rescue capability that differs from the scenario.

12. Ten structured oral examination stations

Purpose and station format

These original stations assess surgical judgment under evolving information. Each contains a substantial candidate scenario, three standardized updates, a model response and a station-specific 20-point marking grid. The model describes a defensible reasoning pathway rather than a required verbatim script. Accept clinically sound alternatives that fit the stated physiology, capability and time constraints.

Station	Main judgment challenge
1	Recurrent shock: accessible bleeding, pelvic control and imaging eligibility.
2	Difficult airway with hemorrhage, cervical precautions and postintubation collapse.
3	Retained hemothorax, misleading drain output and a major air leak.
4	New focal neurological deterioration during hemorrhage rescue.
5	Abbreviated surgery, temporary measures and timing of return.
6	Nonoperative care, arterial injury and rescue capability.
7	Pregnancy: maternal rescue, imaging concern and obstetric coordination.
8	Pediatric compensation, weight-based preparation and selective imaging.
9	Older anticoagulated patient, treatment preferences and transport risk.
10	Tertiary review, compartment concern and unacknowledged final reports.

Suggested timing: 2 minutes of reading followed by 10 minutes of discussion. Use the same timing for all candidates. Give the opening question, then release updates at approximately minutes 3, 5 and 7; reserve the final minutes for summary, fallback and handover. For preparation, provide only the opening scenario paragraph; keep all updates, model responses and marking sheets with the examiner until the specified release time.

The stations apply the source framework and supplementary guidance documented in Sections 1-10, particularly Sabiston chapter 36 and the explicitly named population-specific sources. They are educational assessment material, not validated certification instruments.

Examiner instructions and scoring anchors

Use observable reasoning and consistent information

Read each update as written to every candidate. If an action is requested but its result is not supplied, state that the result is not yet available and ask for the contingency plan; do not invent a contradictory injury or physiological response. If capability is unspecified, permit a stated reasonable assumption and record it. Require the candidate to explain immediate action, ownership and reassessment, not just name diagnoses.

Score per domain	Observable performance
0	Absent, seriously incorrect or unsafe reasoning; fails to address the domain despite the opportunity.
1	Recognizes part of the issue only after substantial prompting; major prioritization or rescue omissions remain.
2	Partly correct plan with important gaps, unclear timing or limited reassessment; some prompting is required.
3	Independent, safe and appropriately prioritized plan covering the essential station-specific actions.
4	Meets score 3 and integrates uncertainty, competing risks, actual capability, response/failure triggers and a coherent fallback.

Each station has five distinct domains, each scored 0-4: maximum 20. Sum the ten stations for a maximum of 200, but also preserve domain and station profiles. Suggested global descriptors are needs substantial support, developing, safe independent reasoning, and particularly strong integrated judgment. These descriptors are qualitative and do not establish a validated pass mark.

Safety flags and defensible alternatives

A listed critical error is a serious safety flag if the candidate explicitly commits to it and does not correct it when the relevant change is presented. Record the action and clinical context. It should inform the global judgment and debrief; do not silently alter the numerical score or apply an unvalidated automatic-failure rule. Avoid penalizing the same omission repeatedly across domains.

If a candidate proposes another safe route, ask what makes it feasible and how failure would be managed. Credit a justified alternative rather than forcing the model wording. Document prompting and any information supplied beyond the standardized script. For formal use, review content locally, train examiners and evaluate reliability before setting high-stakes standards.

Oral station 1 | Candidate scenario

Recurrent shock, negative FAST and competing destinations

You are the trauma surgeon at a hospital with emergency surgery and blood support, but an embolization team that needs 45 minutes to assemble. A 36-year-old motorcyclist arrives 55 minutes after injury. Prehospital pressure was 74/42 mm Hg. He is speaking in short sentences, restless and cold, with pressure 104/62 during rapid emergency transfusion and pulse 122/min. There is a dressed thigh wound, a deformed femur and pelvic bruising. A binder lies over the iliac crests. The first FAST is negative, with a limited pelvic view. Hemoglobin is 12.9 g/dL and lactate 5.6 mmol/L. The chest examination shows no clear major pleural threat. CT is on another floor. A resident calls the patient stable because the pressure improved and asks you to approve whole-body CT. The anesthetist asks where the patient is going, while the blood bank requests a decision about continued hemorrhage-pathway delivery. Nobody has yet contacted the operating team. Give your working assessment and direct the next two minutes of care.

Standardized evolving information

Update 1: Pressure falls to 80/48 when blood delivery slows. The thigh dressing is saturated and a pelvic image shows displaced ring injury.

Examiner question: Which actions occur in parallel, and what do the negative FAST and initial hemoglobin mean?

Update 2: After wound control, appropriate binder correction and more blood, pressure rises briefly but falls again. Embolization remains 40 minutes away; the operating team is now ready.

Examiner question: Choose a control route and explain what would change your choice. Is remote CT supportable now?

Update 3: During preparation the patient becomes less responsive and temperature is 34.7 C.

Examiner question: How do you coordinate airway risk, warming, hemostatic support and continued source assessment?

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 1 | Model response

Recurrent shock, negative FAST and competing destinations

Synthesize the trajectory

This is unresolved shock with a transient response, not durable stability. I would announce that assessment, restore overall leadership and assign named actions for external control, airway/breathing reassessment, reliable access, blood support and activation of control resources. Negative FAST does not exclude pelvic/retroperitoneal bleeding; early hemoglobin does not exclude important acute loss.

Control accessible and likely sources

I would verify wound hemostasis, reassess limb perfusion and splint appropriately, and have trained staff correct binder placement over the greater trochanters. I would continue the compartment search and check whether any abdominal or thoracic finding changes the route. These tasks should not wait for a complete anatomical diagnosis.

Choose a realistic destination

With recurrent shock and remote CT, I would prioritize the fastest effective local control pathway, considering pelvic packing/stabilization and any indicated laparotomy rather than wait passively for delayed embolization. I would involve interventional expertise as a complementary option. Exact sequence depends on findings and local capability, and I would state a rescue alternative if the first step fails.

Maintain the bridge and reassess

I would coordinate an urgent airway plan if protective function is failing, anticipating peri-induction collapse. Continue blood-based hemostatic resuscitation, warming, calcium/coagulation reassessment and indicated early-window adjuncts through protocol. After each major action I would reassess perfusion and support requirements and communicate what remains uncontrolled.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 1, 4, 6 and 8 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 1 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Recognizes transient response; rejects exclusion of loss from early hemoglobin or negative/limited FAST.	0-4
2	Assigns effective wound control, correct pelvic stabilization and parallel reassessment of other sources.	0-4
3	Selects timely effective control using actual operating/interventional availability; explains why remote CT is unsafe under the stated trajectory.	0-4
4	Integrates blood-based support, warming, hemostatic/metabolic review and physiological airway preparation.	0-4
5	Names task owners, success/failure signs and a fallback destination; revises the plan when deterioration occurs.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Authorizes routine remote CT solely from the transient pressure or negative FAST despite recurrent collapse.

• Leaves an accessible exsanguinating source untreated while waiting for tests or delayed specialist arrival.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 1, 4, 6 and 8 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 2 | Candidate scenario

Contaminated difficult airway and collapse after intubation

You lead a resuscitation with an experienced airway clinician. A 41-year-old after a collision has extensive facial bleeding, repeated coughing of blood and deteriorating cooperation. Pressure is 82/48 mm Hg, pulse 128/min and saturation 94% with oxygen. A pelvic source of loss is suspected and blood delivery has begun. The cervical spine is not cleared; the collar restricts mouth opening. Suction is intermittently blocked by clot. The airway clinician anticipates difficult visualization and profound peri-induction hypotension. A junior doctor proposes immediate standard-dose induction because a tube is the fastest way to solve the problem. Another insists on completing cervical CT before changing any part of the collar. You have a second suction system, skilled assistance, a difficult-airway trolley and trained emergency rescue capability. Explain your priorities, preparations, coordination with hemorrhage care and the limits of what must be completed before proceeding. You must justify the plan rather than recite a drug list.

Standardized evolving information

Update 1: Urgent airway management is undertaken with coordinated support. Sustained capnography is obtained, but after trolley movement the left chest is quiet, saturation falls and pressure drops to 58/34.

Examiner question: Give your immediate differential and bedside sequence. What does capnography establish, and what does it not establish?

Update 2: The tube mark is deeper than before. After correcting position, air entry improves partially but high pressures and shock persist.

Examiner question: How do you avoid both anchoring on mainstem placement and performing undirected repetitive procedures?

Update 3: A rescue pleural intervention produces brief benefit followed by renewed deterioration.

Examiner question: How do you verify treatment effectiveness and maintain the broader hemorrhage plan?

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 2 | Model response

Contaminated difficult airway and collapse after intubation

Prepare for two difficult problems

I would optimize suction and feasible oxygenation, assign airway roles and backups, and maintain blood delivery and source-control activation. The procedure needs physiological preparation as well as anatomical planning. I would not wait for complete pressure normalization if airway protection is failing. Necessary anterior collar adjustment can be coordinated with appropriate support and movement minimization.

Respond to the new collapse

I would stop transport, call for help and rapidly reassess tube depth, patency, ventilation system and both chest sides while supporting circulation. Sustained capnography supports tracheal ventilation but does not exclude mainstem position, obstruction, equipment problems or new pleural disease. If tension physiology is clinically convincing, treat promptly without waiting for imaging.

Update rather than replace the differential

The depth change explains part of the problem, but partial response means other causes remain. I would reassess ventilation pressures, chest findings and treatment function and retain ongoing hemorrhage and drug/ventilation-related circulatory effects. Do not assume one successful correction explains everything.

Establish durable rescue

After a temporizing pleural maneuver I would verify actual decompression and effective drainage through the trained pathway, then reassess respiratory and circulatory response. Recurrent deterioration demands evaluation of technical failure and additional injury. I would maintain blood and operative coordination, communicate each response and keep a clear rescue plan for oxygenation or circulation failure.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 2-4 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 2 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Identifies aspiration/contamination risk and both anatomical and physiological difficulty; prepares suction, oxygenation and rescue.	0-4
2	Coordinates cervical protection without making clearance or an obstructive collar a prerequisite for lifesaving airway care.	0-4
3	Uses a rapid postintubation differential including depth, patency, equipment, tension, ongoing bleeding and physiological effects.	0-4
4	Treats a convincing mechanical emergency promptly and verifies durable drainage rather than accepting an initial release as permanent success.	0-4
5	Maintains leadership, parallel hemorrhage treatment and explicit reassessment after partial or transient response.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Continues ineffective repeated airway attempts during failed oxygenation without moving to available rescue.

• Delays treatment of a convincing tension emergency for remote imaging during collapse.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 2-4 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 3 | Candidate scenario

Low drain output, retained hemothorax and persistent shock

A 58-year-old restrained driver arrives with blunt left chest trauma. He is intubated, with pressure 78/44 mm Hg during blood support. Ultrasound and a portable radiograph show a large left pleural collection. A chest drain returns 280 mL of blood, then stops. The collector and tubing contain clot, and the left chest remains poorly aerated. Pressure does not recover sustainably. The pelvis is not obviously disrupted and FAST has no clear abdominal fluid, although the examination remains incomplete. A resident recommends continued observation because the drain output is below a familiar threshold for thoracotomy. Another wants to clamp the tube during CT so that transport is simpler. A thoracic-capable surgical team can mobilize promptly. Explain how you interpret the drain number, which information is missing and how you choose between more imaging, technical reassessment and urgent source-control escalation. Your answer should include the possibility that the apparent chest problem is not the only source of shock.

Standardized evolving information

Update 1: Bedside reassessment confirms a substantial persistent pleural collection and poor drainage. Blood requirements are rising.

Examiner question: What takes priority now, and how do customary output thresholds influence rather than dictate your decision?

Update 2: A clinician reports a new continuous major air leak after drain reassessment, with persistent ventilation difficulty.

Examiner question: What further injury concern does this raise, and what is unsafe about simply clamping the tube?

Update 3: The first thoracic intervention improves ventilation, but pressure remains low.

Examiner question: How do you continue the assessment without either ignoring the chest or assuming every remaining problem is thoracic?

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 3 | Model response

Low drain output, retained hemothorax and persistent shock

Interpret measurement failure

The drain number measures blood that reached the collector, not necessarily total intrathoracic loss. Clot and retained collection make underestimation likely. I would urgently verify the system and pleural treatment with trained help while continuing blood support and mobilizing surgical control.

Act on physiology and anatomy together

Persistent shock, increasing blood need and a large retained collection outweigh reassurance from a subthreshold output. Customary drainage thresholds are useful prompts, not rules requiring deterioration to continue until a number is met. Remote CT is not a routine prerequisite for control in this trajectory.

Recognize a persistent leak problem

A major ongoing leak with ventilation failure after system checks raises concern for significant airway or lung injury. I would involve thoracic/airway expertise and targeted assessment such as bronchoscopy when appropriate. Clamping an actively leaking pneumothorax can trap air and recreate tension; quieting the chamber is not the goal.

Reassess the whole patient

I would compare oxygenation, airway pressures and perfusion after each intervention, check continuing chest loss and repeat the broader bleeding and shock assessment. Partial benefit is evidence of one treated component, not proof that other compartments or mechanisms are excluded. Communicate residual threats and the next control decision.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 3, 4, 6 and 8 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 3 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Explains why clotted/ineffective drainage can underestimate loss and checks treatment function.	0-4
2	Escalates control from persistent shock and retained blood without waiting rigidly for a numerical threshold.	0-4
3	Continues blood-based support and avoids unsafe remote imaging delay under the stated conditions.	0-4
4	Recognizes a major persistent air leak and ventilation problem; avoids routine clamping and seeks targeted expertise.	0-4
5	Repeats whole-patient source assessment and states measurable response and rescue triggers.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Waits for an arbitrary drain total despite progressive shock and substantial retained blood.

• Clamps an active major pleural air leak without a controlled specialist indication or rescue plan.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 3, 4, 6 and 8 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 4 | Candidate scenario

Evolving focal deficit during active hemorrhage rescue

A 30-year-old man arrives after a high-speed collision. Before medication he opens his eyes to sound, speaks confused sentences and obeys commands with all four limbs; pupils are equal and reactive. A pelvic injury and abdominal tenderness accompany shock. Emergency blood raises pressure from 76/44 to 106/64 mm Hg, but the improvement is short-lived. Fifteen minutes later, before any sedative or paralytic, he no longer follows commands with the left hand and the right pupil is larger and sluggish. Saturation is 96%, glucose is normal and pressure is now 86/50 during continuing transfusion. CT is remote; local hemorrhage control is available, while neurosurgery is at the referral center. An airway intervention is likely. One colleague says shock explains the neurological change, while another demands immediate CT regardless of transport support. State your problem representation and coordinate a plan for the competing threats, including what evidence would change the immediate destination.

Standardized evolving information

Update 1: The patient is intubated with sedation and paralysis. There is now no motor response.

Examiner question: How do you record the current examination and compare it with the predrug baseline?

Update 2: A team member sets a very low carbon-dioxide target as routine brain protection. No specialist-directed herniation rescue plan has been established.

Examiner question: How do you respond, and what systemic secondary insults must you prevent?

Update 3: The receiving neurosurgeon requests a rapid update while blood needs increase.

Examiner question: Give a concise handover and explain how you reach a shared time-sensitive route rather than allow sequential service delays.

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 4 | Model response

Evolving focal deficit during active hemorrhage rescue

Recognize genuine change

The predrug lateralizing deterioration and pupil change are concerning for intracranial progression. I would not dismiss them as generalized shock. Repeat immediate airway, breathing, perfusion and glucose/medication review while escalating to neurosurgery and maintaining hemorrhage rescue.

Protect the brain and circulation together

Avoid hypoxemia and hypotension and maintain appropriate controlled ventilation. A restrictive bleeding strategy cannot be applied blindly when cerebral perfusion is threatened. Routine excessive hyperventilation can reduce cerebral flow; any temporizing rescue for suspected herniation requires a coordinated specialist/emergency pathway and definitive care.

Preserve an interpretable examination

Record the last reliable E, V and M components, side-specific motor findings, pupils and time. After drugs, identify untestable components and relevant medication timing. Absent movement during paralysis cannot establish a new measured GCS of 3 or irreversible injury. Continue pupil and physiological surveillance and repeat examination when feasible.

Choose and communicate a supported route

I would communicate the neurological trajectory, source-control concern, support requirements, local capability and journey/scanner risk. With anesthesia and both surgical services, determine whether immediate local control, supportable urgent imaging or specialist transfer offers the safest achievable sequence. State which threats remain untreated, who owns each decision and what deterioration will change the route.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 4-6 and 8 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 4 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Identifies new predrug focal/pupillary change and retains both intracranial and systemic threats.	0-4
2	Protects oxygenation/perfusion and avoids indiscriminate low-pressure or routine hyperventilation strategies.	0-4
3	Records component and lateralized findings with timing and drug-related testability limitations.	0-4
4	Makes a coherent destination decision from trajectory, support and available capability rather than an absolute CT rule.	0-4
5	Communicates an integrated plan, assigns responsibility and defines reassessment/failure triggers.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Dismisses a new predrug focal deficit without urgent reassessment/escalation.

• Uses the paralyzed examination alone to declare irreversible injury or limit otherwise indicated rescue.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 4-6 and 8 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 5 | Candidate scenario

When to stop reconstruction and use staged care

You are operating on a 39-year-old with penetrating abdominal trauma. Major hemorrhage has been controlled provisionally and bowel injury has been identified. Temperature is 34.2 C, acidosis is worsening and coagulation is deteriorating despite ongoing hemostatic resuscitation. Blood and vasoactive support needs are increasing. A definitive reconstruction would take substantial additional time, while safe temporary management and critical-care resuscitation are available. Your assistant argues that completing everything now avoids another anesthetic and demonstrates good surgery. Anesthesiology reports falling reserve and asks for a clear endpoint. A vascular specialist is available for advice about a temporary measure, but cannot complete every reconstruction immediately. Explain whether and why you would abbreviate the operation, what must be achieved before leaving the operating room and what obligations your chosen temporary measures create. Do not rely on a single laboratory cutoff or on the phrase damage control alone.

Standardized evolving information

Update 1: A temporary abdominal closure is planned, packs remain and bowel continuity is deferred.

Examiner question: Specify the operative record and ICU handover, including return planning and surveillance.

Update 2: In ICU, pressure initially improves but then falls, abdominal distension increases and transfusion needs rise. A relook is booked for the next day.

Examiner question: Does the booking determine the timing? What do you do now?

Update 3: Consider the counterfactual: control is secure, temperature and support improve rapidly, and the remaining essential repair would take only a short time.

Examiner question: Would your original decision necessarily remain correct? Explain the competing morbidity of unnecessary staging.

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 5 | Model response

When to stop reconstruction and use staged care

Choose a physiological endpoint

The current trajectory and prolonged repair burden support abbreviated damage control. I would tell the team the rationale and prioritize effective hemorrhage and contamination control with safe temporary management. I would not wait for every feature of a lethal-triad definition, nor use staging reflexively from one number.

Make temporary treatment accountable

Document residual injuries, pack count/location through local practice, temporary devices, deferred reconstruction and closure. Handover blood use, temperature, metabolic/hemostatic trajectory, support and complications. Name the responsible team, intended return/reassessment and the findings that require an earlier response.

Treat failure before the calendar

Recurrent shock and increasing distension require immediate reassessment for ongoing bleeding or a complication, with renewed surgical judgment about urgent return while resuscitation continues. ICU support does not substitute for control. A scheduled relook is conditional on the patient remaining appropriately supported and improving.

Reassess the alternative

If physiology truly recovers and necessary completion is short and safe, definitive repair may be preferable. Staging can add operations, open-abdomen complications and delayed recovery. I would integrate current reserve, anatomy, duration and expertise and keep a plan to abbreviate if conditions worsen again.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 4 and 8 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 5 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Justifies abbreviation from trajectory and repair burden, avoiding a single-number or automatic-staging rule.	0-4
2	States adequate immediate hemorrhage/contamination control and safe temporary endpoints.	0-4
3	Provides explicit temporary-anatomy documentation, monitoring, ownership and return plan.	0-4
4	Recognizes recurrent ICU deterioration as a possible need for urgent earlier control.	0-4
5	Explains when definitive completion is reasonable and recognizes morbidity from unnecessary staging.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Continues lengthy reconstruction despite uncontrolled physiological deterioration without a defensible benefit.

• Leaves temporary measures with no accountable monitoring or return plan, or ignores recurrent shock until the scheduled relook.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 4 and 8 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 6 | Candidate scenario

Nonoperative care depends on surveillance and rescue

A 55-year-old woman has blunt abdominal trauma. After initial support, pressure remains 116/72 mm Hg and pulse 94/min without escalating treatment for the past 35 minutes. She is alert with localized tenderness and no peritonitis. Contrast CT shows a substantial solid-organ injury with a focal arterial bleeding concern but no definite bowel injury. The hospital has emergency surgery and blood, but no embolization until the next morning. The ward provides infrequent observations and the overnight team has competing emergencies. A referral center with appropriate interventional and monitored-care capability can accept her, and skilled transport takes about one hour. One resident recommends local ward observation because pressure is normal; another recommends immediate organ removal solely from anatomical grade. The patient asks why she needs further treatment if she feels better. Explain the options, the role of the arterial finding and how capability affects eligibility for a nonoperative pathway.

Standardized evolving information

Update 1: Radiology confirms that the arterial finding may require targeted treatment. The patient remains supportable and transport is ready.

Examiner question: Define the immediate plan and the conditions for departure.

Update 2: Before departure, pressure falls to 82/48, blood requirements rise and abdominal tenderness becomes diffuse.

Examiner question: How does this change the transfer/nonoperative plan?

Update 3: After definitive treatment, the patient improves.

Examiner question: Specify observation, reassessment, pending-result and follow-up obligations rather than equating procedural success with discharge readiness.

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 6 | Model response

Nonoperative care depends on surveillance and rescue

Select a pathway, not a label

I would discuss the lesion with radiology and the receiving specialist. Anatomical severity alone does not mandate organ removal, but normal pressure does not make an arterial concern irrelevant. Nonoperative care requires adequate surveillance and timely rescue, which the proposed local ward lacks.

Use the current opportunity

If the response remains sustained and transport is supportable, arrange early transfer for appropriate specialist intervention and monitoring, maintaining local operative readiness until departure. Explain that transfer supplies treatment and rescue capability, not simply a more impressive hospital. Confirm receiving responsibility, support, escort and failure contingencies.

Revise when eligibility changes

The new shock and diffuse tenderness may establish pathway failure or a new operative indication. Repeat xABCDE and obtain immediate senior control judgment. Do not depart automatically because transport has arrived or acceptance was documented. Appropriate local lifesaving intervention may now take priority over the longer journey.

Continue accountable care

After intervention, follow symptoms, physiology and selected laboratory/imaging reassessment. Define triggers for renewed bleeding or evolving injury, reconcile final reports and complete surveys. Provide injury-specific follow-up and explain residual uncertainty; a successful procedure addresses one problem rather than guaranteeing whole-patient readiness for discharge.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 6 and 8 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 6 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Integrates physiology, anatomy and the arterial finding without an automatic grade-based operation rule.	0-4
2	Defines nonoperative prerequisites: monitoring, reassessment, failure triggers and rescue capability.	0-4
3	Plans supported specialist transfer during sustained improvement with local readiness and direct communication.	0-4
4	Revises the route promptly after recurrent shock/new abdominal concern rather than following administrative momentum.	0-4
5	Explains the plan to the patient and defines post-treatment surveillance and diagnostic closure.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Leaves this patient on unsupported routine ward observation solely because pressure is normal.

• Continues the transfer journey plan despite new collapse without evaluating necessary available local lifesaving treatment.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 6 and 8 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 7 | Candidate scenario

Pregnancy, imaging concern and maternal deterioration

A 28-year-old at 30 weeks of pregnancy arrives after a restrained collision. She is alert with a belt mark and increasing abdominal tenderness. Pressure is 108/66 mm Hg, pulse 112/min and hands are cool. FAST is negative and a brief fetal assessment detects cardiac activity. Her family asks that no CT be performed because of radiation. The patient asks for an explanation and has not refused investigation herself. Obstetric support is present, the trauma surgeon is available and maternal imaging/operative capability is immediate. A clinician proposes fetal observation first and MRI later, while another recommends immediate transfer to a neonatal specialist center 70 minutes away. There is no comprehensive assessment of maternal hemorrhage yet. Explain your first priorities, how you involve the patient, what fetal findings establish and how you select imaging or control without creating a harmful diagnostic delay.

Standardized evolving information

Update 1: Pressure falls to 90/52 and interaction worsens. Obstetric monitoring is also concerning.

Examiner question: What changes in your priorities, positioning, resuscitation and destination decision?

Update 2: Following appropriate maternal assessment and treatment, physiology becomes supportable again.

Examiner question: What obstetric assessment and observation remain necessary, and how do Rh status and indicated prophylaxis enter the plan?

Update 3: The patient remains anxious about radiation and asks whether waiting for MRI would be safer.

Examiner question: Give a short balanced explanation of the immediate diagnostic benefit and alternatives without dismissing her concern.

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 7 | Model response

Pregnancy, imaging concern and maternal deterioration

Center maternal rescue and autonomy

I would repeat immediate maternal assessment, support oxygenation/perfusion and seek hemorrhage or other correctable threats. Fetal cardiac activity and negative FAST do not establish maternal safety. Involve obstetrics in parallel and ask the capable patient about her understanding and preferences rather than treating a family request as her refusal.

Choose a supportable route

Reduce aortocaval compression in later gestation with appropriate positioning/support while preserving injury precautions. Coordinate blood support and time-critical control. If imaging is indicated and tolerable, choose an appropriate protocol with radiology; if current findings establish urgent control, do not require routine CT first. Reassess whether the longer transfer is survivable before prioritizing neonatal capability.

Continue obstetric care

After rapid maternal/primary-survey priorities, arrange gestation-appropriate fetal and obstetric assessment. Use the specialist observation pathway; EAST 2025 conditionally supports at least 4-6 hours in viable pregnancies, with longer monitoring when concerns persist. Assess Rh status and anti-D requirements and indicated fetomaternal-hemorrhage testing with obstetrics.

Explain the tradeoff

I would explain what lesion we need to identify, how delay could harm her and the fetus, and why a later MRI may not answer the urgent question in time. Medically indicated imaging should not be withheld solely because of pregnancy; select the appropriate examination and minimize unnecessary studies. Invite questions and document the discussion without offering a zero-risk promise.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 4, 6, 8 and 9 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 7 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Prioritizes maternal rescue while coordinating fetal/obstetric assessment; interprets reassuring snapshots appropriately.	0-4
2	Adapts positioning and support and bases imaging/control/transfer on current physiology and capability.	0-4
3	Addresses the capable patient directly, distinguishes family concern from refusal and communicates risks/benefits accurately.	0-4
4	Plans formal obstetric observation and Rh/prophylaxis assessment through the relevant pathway.	0-4
5	Maintains explicit reassessment, receiving coordination and a fallback for further deterioration.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Delays an indicated maternal lifesaving diagnosis or intervention solely for fetal testing or to await MRI.

• Treats family concern as a capable patient refusal without speaking to her, or transfers through collapse without assessing maternal rescue needs.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 4, 6, 8 and 9 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 8 | Candidate scenario

Compensated pediatric shock and adult-protocol momentum

A 9-year-old child arrives after a collision. He is pale and restless with cool extremities, delayed refill and an elevated age-adjusted pulse. Systolic pressure is 104 mm Hg. He has abdominal bruising and a painful thigh injury. The adult trauma team considers circulation satisfactory because the pressure exceeds 90. Drug preparation and blood requests use fixed adult quantities. An adult whole-body CT package is ordered automatically from the mechanism, while the examination remains incomplete. Pediatric consultation is available immediately and appropriate equipment can be brought to the room. A parent is distressed and repeatedly asks why so many people are doing different tasks. Explain how you establish priorities, interpret the apparently preserved pressure and reorganize preparation without losing time. Your answer should distinguish selective pediatric imaging from a categorical refusal to use CT.

Standardized evolving information

Update 1: Perfusion worsens while pressure remains initially preserved. Weight has not yet been confirmed and intravenous access is difficult.

Examiner question: Describe safe preparation, access escalation and the role of pediatric expertise.

Update 2: After support the child is stable enough for further assessment, with localized persistent abdominal concern.

Examiner question: How do you select imaging and avoid both adult pan-scan momentum and false reassurance from negative FAST?

Update 3: The caregiver account later differs from the observed injuries and the child's developmental capabilities.

Examiner question: How do safeguarding assessment and objective documentation fit alongside clinical care?

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 8 | Model response

Compensated pediatric shock and adult-protocol momentum

Recognize compensation

The circulation findings are concerning despite a preserved pressure. I would reassess immediate threats and bleeding sources, activate age-appropriate support and involve pediatric expertise early. Adult pressure cutoffs cannot exclude pediatric shock. Explain roles briefly to the parent while named staff continue treatment.

Prepare precise treatment

Obtain a reliable weight or appropriate emergency estimate and use pediatric weight-based protocols and equipment. Address access promptly with a suitable escalation/IO pathway when needed rather than repeated delaying attempts. Protect temperature and verify medication/blood calculations with the team. Do not wait for hypotension to prepare correctly.

Choose injury-directed imaging

After adequate resuscitation and a reliable targeted assessment, select the study that answers the persistent abdominal question. Routine adult whole-body CT is not the default for children, but indicated CT remains appropriate. Negative FAST does not clear the abdomen or replace a clinical imaging decision. Continue monitoring and a rescue plan through the study.

Protect safety and information

Treat immediate threats first and continue objective documentation. A mismatch in history warrants the appropriate safeguarding/pediatric pathway, not an accusatory interruption of resuscitation or suppression of concern. Coordinate sensitive questioning and specialist input, avoiding repeated leading interviews and preserving privacy and the child's welfare.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 1, 4, 6 and 9 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 8 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Recognizes possible pediatric hypoperfusion despite preserved pressure and acts on age-appropriate signs.	0-4
2	Uses weight-based preparation, suitable equipment/access escalation and pediatric expertise with temperature protection.	0-4
3	Selects clinically indicated pediatric imaging without routine adult pan-scanning or a blanket CT prohibition.	0-4
4	Coordinates communication and monitoring with explicit treatment-response reassessment.	0-4
5	Integrates objective documentation and appropriate safeguarding referral without delaying urgent care.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Waits for adult-defined hypotension before responding to worsening pediatric perfusion.

• Uses unverified fixed adult drug/blood dosing despite available pediatric preparation, or delays lifesaving care for a safeguarding interview.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 1, 4, 6 and 9 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 9 | Candidate scenario

Frailty, anticoagulation and the meaning of a CPR limitation

An 83-year-old woman falls from standing and arrives with hip pain and flank bruising. She takes apixaban and a beta blocker and has chronic kidney disease. Pressure is 114/68 mm Hg and pulse 70/min, compared with usual systolic pressure near 165. She is newly confused with cool hands. Hemoglobin is 11.8 g/dL, INR 1.1 and FAST is negative. A resident recommends routine orthopedic admission because the mechanism was minor. Her daughter reports that she normally lives independently and carries a no-CPR document but has previously accepted surgery. The daughter is unsure of the last anticoagulant dose. Emergency blood and local surgery are available, while embolization requires transfer. Explain your integrated assessment, how you resolve medication uncertainty and how treatment preferences influence the plan without allowing age or a document label to replace judgment.

Standardized evolving information

Update 1: Pressure falls to 88/50 and flank swelling increases. The routine coagulation tests remain near normal.

Examiner question: How do these results affect the bleeding/reversal decision, and what must not wait?

Update 2: The patient briefly becomes more interactive and asks whether an operation could help her return home.

Examiner question: How do you assess participation and explain proportional treatment?

Update 3: Transfer is accepted, but ongoing support needs rise and the journey is over an hour.

Examiner question: What must be reconsidered before departure, and what information does the receiving team need?

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 9 | Model response

Frailty, anticoagulation and the meaning of a CPR limitation

Identify the hidden trajectory

Relative hypotension, new confusion and peripheral findings suggest occult hypoperfusion despite the pulse and low-energy mechanism. I would reassess xABCDE, seek bleeding sources and activate appropriate support. Negative FAST and early hemoglobin do not exclude retroperitoneal loss; age does not establish futility.

Treat drug effect and lesion together

Identify the agent, last dose, renal context and indication through family/pharmacy/records while treatment proceeds. Normal INR/aPTT does not exclude clinically relevant DOAC effect. In major bleeding, arrange current agent-specific reversal with expert support while mobilizing source control. Do not wait for complete medication certainty to support circulation or control an established threat.

Clarify actual goals

Assess decision-specific capacity with communication support and treat reversible contributors to confusion. Explain plausible benefits, burdens and uncertainty in terms of her goals and baseline function. Clarify the document: declining CPR is not automatically a refusal of transfusion, surgery or other indicated care. Use an appropriate surrogate when needed and document the agreed scope.

Reassess transport eligibility

Acceptance is not clearance for a deteriorating journey. Compare time to local lifesaving control with transport risk and actual specialist capability, in senior discussion. Communicate trajectory, support, exposure/reversal, preferences, investigations and unresolved findings; provide appropriate escort, blood/support and contingency arrangements if transfer remains supportable.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 4, 8 and 9 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 9 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Recognizes occult shock from baseline/trajectory and avoids minor-mechanism, pulse, FAST or hemoglobin reassurance.	0-4
2	Resolves anticoagulant exposure and renal context; understands limits of routine tests and uses agent-specific expert reversal in major bleeding.	0-4
3	Maintains timely source control and appropriate support rather than treating reversal as definitive hemostasis.	0-4
4	Clarifies capacity, baseline function and actual treatment limitations without age-based exclusion.	0-4
5	Reassesses transport safety and communicates physiological, medication and goals-of-care information with a fallback.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Withholds otherwise indicated reversible-threat treatment solely from age or a no-CPR label.

• Excludes major bleeding/DOAC effect from normal INR and negative FAST despite progressive shock.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 4, 8 and 9 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____

Oral station 10 | Candidate scenario

Tertiary reassessment, report discrepancies and a threatened limb

A 46-year-old worker fell from height and underwent urgent fixation of a threatened tibial fracture. The initial secondary survey was interrupted and limited by pain, then sedation. He has now been extubated. The referring summary says torso CT negative, but only preliminary reports are in the chart. He describes contralateral heel pain, focal back tenderness and increasing abdominal pain. The operated calf is tense, analgesic needs are rising and passive toe movement is very painful, although the foot remains warm with palpable pulses. A final CT addendum mentions equivocal mesenteric change and unexplained fluid; neither hospital has acknowledged it. The orthopedic team assumes trauma has reviewed everything, while trauma assumes postoperative complaints belong to orthopedics. He is due to move to a lower-acuity ward. Explain your immediate priorities, how you complete the diagnostic review and how you close the ownership gaps without waiting for a routine tertiary-round slot.

Standardized evolving information

Update 1: Senior review finds evolving abdominal guarding, but pressure and hemoglobin remain relatively stable.

Examiner question: What determines whether exploration or further imaging is needed?

Update 2: The calf findings continue despite initial review and pulses remain present.

Examiner question: How do you interpret the pulses, and what response is required?

Update 3: After urgent issues are addressed, several nonblocking final reports and one unexamined region remain.

Examiner question: Give a safe transfer/ward handover and explain how you document the delayed findings and learn from the process.

Candidate task: state priorities, justify the next action, identify who will deliver it and explain what response or failure changes the plan. Provide only the opening scenario for candidate preparation. The examiner retains the updates and releases them sequentially; all following pages are examiner material.

Oral station 10 | Model response

Tertiary reassessment, report discrepancies and a threatened limb

Separate simultaneous urgent problems

I would repeat immediate physiology and obtain urgent compartment assessment; preserved pulses do not exclude compartment syndrome. Increasing abdominal symptoms plus an equivocal addendum also need urgent surgical review. These concerns should not wait for a scheduled tertiary survey or lower-acuity transfer. Assign named clinicians while I maintain the overall picture.

Use present examination

If the current abdomen establishes peritonitis or another operative indication, do not require free air or another routine CT before acting. If findings remain equivocal in a supportable patient, targeted imaging and close serial senior assessment may clarify them. Stable pressure and hemoglobin cannot exclude evolving bowel or mesenteric injury.

Complete a reliable diagnostic reconciliation

The patient can now identify symptoms previously untestable. Repeat head-to-toe and neurological assessment, review actual imaging coverage/final interpretations and evaluate heel/spinal concerns appropriately. Contact radiology about the addendum and ensure the changed plan is acknowledged. A torso summary does not clear every limb or evolving injury.

Close the loop honestly

Maintain confirmed injuries, suspected findings and unexamined regions separately. Assign each pending result or reassessment to a named recipient with a time/trigger and escalation route. Record when delayed findings were recognized, the initial limitations and resulting treatment accurately; do not backfill invented negatives. Review how interruption, fixation and handover gaps contributed, focusing on useful process correction.

Clinical pearl
Credit a different safe plan when the candidate justifies feasibility, timing, monitoring and rescue under the stated constraints. Naming a procedure without those conditions is incomplete reasoning.

Review links: Sections 6-8 of this chapter. Apply the source and supplementary-guidance boundaries described in those sections. Technical procedures and medication choices require the appropriate trained local pathway.

Oral station 10 | Marking and debrief

Station-specific marking grid: maximum 20

Domain	Observable evidence to assess	Score
1	Recognizes urgent compartment and abdominal concerns and pauses routine disposition.	0-4
2	Understands preserved pulses do not exclude compartment syndrome and seeks timely specialist assessment.	0-4
3	Uses evolving clinical evidence to choose exploration versus targeted further evaluation without rigid imaging or hemoglobin requirements.	0-4
4	Performs tertiary reconciliation of history, examination, actual imaging coverage and final-report discrepancies.	0-4
5	Assigns pending-result and incomplete-examination ownership, documents chronology honestly and identifies preventable system gaps.	0-4

Apply the shared anchors on the examiner-instructions page to each row. Score 3 requires the essential actions to be safe and independent; score 4 requires a well-integrated explanation of uncertainty, competing priorities and rescue. Record substantive prompts and accept justified alternatives.

Critical safety flags

• Waits for pulse loss before escalating a clinically threatened compartment.

• Ignores new peritonitis or an important report discrepancy solely because earlier CT or hemoglobin appeared reassuring.

Document an actual unsafe commitment and whether it was corrected; an omission that was never explored is not automatically the same as an explicit harmful decision. Interpret flags with the shared scoring instructions.

Focused debrief

Ask the candidate: Which finding most changed your initial plan? What assumption could have been wrong? What would have triggered earlier rescue? Use the five scored domains to identify one strength and one specific action to improve. Revisit sections 6-8 for the relevant teaching and source discussion.

Examiner record

Domain scores: ____ /4 ____ /4 ____ /4 ____ /4 ____ /4
Total: ____ /20 Global judgment: _____
Prompts / alternative plan / safety context: _____
Priority feedback and agreed next learning task: _____