ACTT Scenario Companion Guide

Official Master Scenario Outline

Royal Canadian Navy Physician Assistant Focus

Separate companion guide to the ACTT manual. This outline locks the scenario set, standard scenario structure, coverage map, and recommended build order for the full scenario-based workbook.

Purpose of the Scenario Guide

- Apply the main ACTT manual in realistic shipboard cases.
- Teach decision-making from scene to Sick Bay to evacuation or prolonged hold.
- Use a hybrid format: narrative case, staged decision points, guided walkthrough, model actions, explanations, side notes, and operational tips.
- Emphasize what to do, why to do it, what to watch next, and how shipboard realities change the plan.

Standard Structure for Every Scenario

1. Scenario title
2. Learning objectives
3. Initial setting: alongside or at sea, shipboard location, available personnel, and constraints
4. Initial presentation: where the patient is found, who finds them, and what is seen first
5. Immediate scene priorities
6. Decision point: treat on scene versus move now
7. Movement considerations: route, device, litter, medsled, Stokes, and risks during movement
8. Arrival to Sick Bay or alternate treatment space
9. Ongoing assessment and management
10. Decision point: jetty transfer, helicopter hoist, or hold up to 72 hours
11. Guided walkthrough with expected actions in sequence
12. Teaching notes: reasons, pitfalls, and alternate acceptable approaches
13. Medication notes
14. Procedure notes
15. Shipboard operational notes
16. Communication, handover, and teleconsultation points
17. What could go wrong next
18. Key takeaways

Scenario Set Master Outline

Scenario 1: Progressive Head Injury After Fall in a Machinery Space

- Core focus: TBI, airway risk, scene extraction, neuro trend monitoring, and evacuation timing.
- Likely scenario arc: sailor falls in a confined space and strikes their head; initially awake, then worsening confusion; decision whether to package and move immediately versus stabilize briefly on scene; worsening GCS en route or after arrival; decide on urgent jetty transfer if alongside, hoist if at sea and deteriorating, or short hold while arranging transfer.
- Main teaching points: GCS trend, spinal precautions as appropriate, when GCS and airway triggers require RSI planning, TBI targets (oxygen, SBP, EtCO2), early signs of herniation, documentation, and handover.

Scenario 2: Chest Trauma With Suspected Tension Pneumothorax on Upper Deck

- Core focus: thoracic trauma, needle thoracostomy, chest tube transition, and movement after decompression.

- Likely scenario arc: blunt or penetrating chest injury on deck; respiratory distress and shock develop; immediate scene recognition of tension physiology; decision to decompress before movement; reassessment after decompression; Sick Bay chest tube; evacuation versus short hold depending on response.
- Main teaching points: clinical diagnosis of tension pneumothorax, when not to delay decompression, landmarking in a difficult environment, decompression as temporizing only, chest tube setup and monitoring, and risk of re-tension during movement.

Scenario 3: Major Burn With Inhalation Risk in a Shipboard Fire Response

- Core focus: burns, airway burn risk, Rule of 10s, urine output targets, and prolonged resuscitation.
- Likely scenario arc: casualty exposed in machinery or galley fire; facial burns, soot, hoarseness, and significant TBSA burns; initial care at scene during or after fire response; decision on early intubation before swelling worsens; burn fluid initiation and transfer to Sick Bay; long hold while awaiting evacuation.
- Main teaching points: early airway decision in burns, intubate before edema worsens, burn fluid formula as a starting point, Foley and urine-guided titration, pain control, tube securement on burned skin, and prolonged holding burden.

Scenario 4: Septic Shock in a Sailor With Infection and Delayed Evacuation

- Core focus: sepsis, antibiotics, fluid versus overload risk, vasopressor use, and prolonged monitoring.
- Likely scenario arc: patient presents ill from berthing or workspace with fever, malaise, and hypotension; source initially unclear or pneumonia or abdominal source suggested; stabilization in Sick Bay; early antibiotic decision; fluid response limited; norepinephrine needed; weather or position delays evacuation.
- Main teaching points: early sepsis recognition, antibiotics within one hour, empirical regimen selection, when to stop reflex fluid boluses, MAP target and pressor start, repeated reassessment over hours, and teleconsultation.

Scenario 5: Combative Casualty With Possible Hypoxia, Hypoglycemia, or Head Injury

- Core focus: agitation and combative algorithm, safety, sedation, hidden medical causes, and airway after chemical restraint.
- Likely scenario arc: casualty becomes violent in a compartment or on deck; brought with assistance or controlled where found; cause uncertain, such as intoxication, TBI, hypoxia, hypoglycemia, or delirium; manage scene safety first; restraint and chemical sedation decisions; reassessment reveals underlying cause or ongoing instability; possible need for airway control.
- Main teaching points: do not treat agitation as purely behavioral, verbal de-escalation then physical then chemical restraint, ketamine and midazolam choices, glucose when feasible, airway monitoring after sedation, and when sedation failure becomes an airway pathway.

Scenario 6: STEMI Alongside Versus At Sea With Reperfusion Decision

- Core focus: STEMI recognition, ECG-driven decisions, fibrinolysis, and transfer pathway choice.
- Likely scenario arc: sailor presents with chest pain, diaphoresis, and ongoing symptoms; ECG shows STEMI; if alongside, could reach jetty ambulance; if at sea, definitive PCI is delayed and hoist may be delayed; decide whether fibrinolysis is indicated; adjunct therapy and monitoring after treatment.

- Main teaching points: STEMI criteria, PCI timing threshold, tenecteplase eligibility, contraindication screening, adjunct anticoagulation and clopidogrel, reperfusion and bleeding surveillance, and operational decision between transfer now versus treat first.

Scenario 7: Hypothermic Casualty Recovered From Cold Water

- Core focus: environmental injury, hypothermia staging, altered arrest logic, rewarming, and evacuation thresholds.
- Likely scenario arc: person overboard or cold exposure casualty recovered; may be conscious but impaired, or pulseless depending on version; initial care at recovery point; care during movement to Sick Bay; stage-based treatment; need to choose continued onboard management versus urgent extraction.
- Main teaching points: hypothermia staging, gentle handling, rewarming strategy, modified arrest rules if severe, when prolonged resuscitation is still indicated, and transport implications.

Scenario 8: Polytrauma With Delayed Evacuation and 24–72 Hour Hold

- Core focus: integrated multi-system care, prolonged holding, reassessment rhythm, device maintenance, and team plus documentation.
- Likely scenario arc: multi-injury casualty after major shipboard accident; initial stabilization requires multiple interventions; evacuation not immediately available; must transition from acute response to organized hold; patient requires hours of care with recurring reassessments.
- Main teaching points: moving from resuscitation to maintenance, explicit problem list, repeat reassessment schedule, medication continuity, fluids in and out, device checks, escalation triggers, and structured handover across time.

Scenario 9: Failed Airway / Cannot Intubate, Cannot Oxygenate

- Core focus: failed airway, cricothyroidotomy, rescue sequence, and procedural decisiveness.
- Likely scenario arc: airway emergency where intubation fails or is impossible; must convert quickly to surgical airway; could follow facial trauma, airway swelling, or severe obstruction.
- Main teaching points: attempt limits, failed-airway recognition, cric decision threshold, surgical airway execution logic, and post-procedure management.

Scenario 10: Major Shoulder Dislocation / Orthopedic Injury During Shipboard Work

- Core focus: orthopedic assessment, reduction techniques, sedation choice, movement, and follow-up.
- Likely scenario arc: isolated musculoskeletal injury, painful but stable; scene assessment and movement to Sick Bay; decision to reduce onboard versus evacuate versus defer; sedation or analgesia support and reduction.
- Main teaching points: neurovascular checks, reduction indications and contraindications, technique selection, safe analgesia or sedation, repeat neurovascular exam, and lower-acuity but operationally important care.

Scenario 11: Pressor-Dependent Shock With Resource Strain

- Core focus: vasopressors, infusion safety, monitoring burden, and sustainability decisions.
- Likely scenario arc: patient initially fluid-responsive then deteriorates; requires norepinephrine; shipboard staffing and equipment strain becomes central issue; decide whether holding remains safe.
- Main teaching points: when pressors are indicated, line monitoring, extravasation risk, sustainable care versus unsafe overreach, and early escalation to outside support.

Scenario 12: Chest Tube Patient Who Re-Deteriorates During Holding

- Core focus: procedure maintenance, recurrent tension or blockage or dislodgement, and trend recognition.
- Likely scenario arc: patient initially improves after chest intervention; later drifts with hypoxia, hypotension, and chest changes; team must recognize device failure, not assume stability.
- Main teaching points: no procedure ends at placement, chest tube function checks, recurrent tension recognition, reassessment and troubleshooting, and the fact that stable patients can drift.

Coverage Map Across the Scenario Guide

- Airway compromise
- RSI and failed airway
- Cricothyroidotomy
- Tension pneumothorax
- Chest tube management
- TBI
- Burns
- Sepsis
- STEMI and fibrinolysis
- Hypothermia
- Sedation and combative patient management
- Analgesia and procedural sedation
- Prolonged holding
- Device maintenance
- Shipboard movement
- Jetty transfer decisions
- Hoist extraction decisions
- 24-72 hour holding decisions
- Teleconsultation
- Command communication
- Handover

Recommended Build Order

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End State

This document locks the official scenario-guide outline. It serves as the standing reference for the separate scenario-based workbook so each scenario can be created one at a time without losing the overall structure, coverage plan, or intended teaching sequence.

Scenario 1: Progressive Head Injury After Fall in a Machinery Space

ACTT Scenario Companion Guide
Royal Canadian Navy Physician Assistant Focus

Scenario setting	Shipboard machinery space, initially at scene then movement to Sick Bay
Primary themes	TBI, airway risk, spinal precautions, scene extraction, transport, neuro trend monitoring, evacuation decision
Likely evacuation pathways	Jetty transfer if alongside; helicopter hoist if at sea; short hold only if temporarily unavoidable
Default teaching format	Narrative case + decision points + guided walkthrough + side notes and operational tips

1. Learning Objectives

- Recognize a worsening head-injured casualty before complete decompensation occurs.
- Decide what must be done at scene before movement and what can wait until Sick Bay.
- Apply TBI priorities: oxygenation, ventilation, blood pressure protection, temperature control, and serial neurologic reassessment.
- Decide when declining mental status becomes an airway problem rather than a monitoring problem.
- Choose the appropriate evacuation pathway: immediate jetty transfer, hoist, or only a short bridging hold while extraction is arranged.

2. Initial Setting

Operational context. The ship is conducting routine machinery checks. The casualty is located in a lower machinery space with noise, heat, cramped access, metal ladders, and limited room to work. The patient cannot simply be wheeled directly into Sick Bay; extraction requires packaging, controlled movement, and role assignment.

Scenario variants. The case can be run in one of two ways depending on training objective: (1) alongside - local ambulance can meet the ship at the jetty; or (2) at sea - helicopter extraction is possible by hoist only, because the aircraft cannot land on the flight deck. Both versions teach the same early clinical priorities but change transport timing and risk.

3. Initial Presentation

A sailor slips while descending a ladder in the machinery space, falls several feet, and strikes the right side of the head against hard metal. Witnesses report a brief loss of consciousness of a few seconds, followed by groaning and confused speech.

When first found, the casualty is awake but disoriented, attempting to sit up, and asking repetitive questions. There is a scalp laceration with moderate bleeding. No obvious catastrophic external hemorrhage is seen. The casualty complains of severe headache and nausea.

Initial on-scene findings may include: confused speech, GCS 13 to 14, tachycardia, normal or borderline elevated blood pressure, no gross limb deformity, and uncertain neck pain due to mechanism and altered mentation.

4. Immediate Scene Priorities

- Ensure scene safety: machinery hazards, heat, rotating equipment, slippery surfaces, and limited footing must be controlled first.
- Assign a clinical lead immediately. One person maintains the plan; others perform tasks.
- Control scalp bleeding with direct pressure and dressing, but do not let the visible laceration distract from the intracranial risk.
- Perform a rapid primary survey: airway, breathing, circulation, disability, exposure.
- Because the mechanism is significant and the casualty is confused, treat the cervical spine cautiously until the situation is clarified.
- Do not rush movement before deciding whether an immediate intervention is needed first.

5. Decision Point: Treat on Scene vs Move Now

Teaching point. This case is designed to force the distinction between two common errors: (1) staying too long at scene doing nonessential tasks, and (2) moving too early without addressing an immediately life-threatening deterioration.

- If the casualty is oxygenating, ventilating, and maintaining the airway, do only the essential scene interventions: bleeding control, spinal-aware handling, quick neuro baseline, oxygen if needed, packaging, and move.
- If the casualty is rapidly deteriorating - dropping level of consciousness, repeated vomiting with poor airway protection, obvious hypoxia, or airway obstruction - then the team may need to stabilize before or during extraction rather than moving first and hoping for the best.
- The default in this scenario is not to fully manage the patient in the machinery space. The default is to do what is essential there, then move toward a better treatment location as safely and quickly as possible.

6. Scene Management Sequence

- Take manual cervical spine control if feasible and clinically justified by mechanism plus altered mentation.
- Apply supplemental oxygen if SpO2 is not clearly adequate or if monitoring is limited at the scene.
- Control visible scalp bleeding with direct pressure and dressing.
- Obtain a rapid neurologic baseline: GCS, pupils, gross limb movement, and obvious seizure activity or vomiting.
- Perform a quick glucose check if the picture is confusing or agitation seems disproportionate, but do not let a nonessential check delay extraction.
- Package for movement using the safest available method for the compartment and route. A Stokes litter or medsled may be appropriate depending on access and vertical movement needs.

7. Movement to Sick Bay

Movement is a treatment decision. The transfer from scene to Sick Bay is not administrative; it is part of the clinical plan. The patient can worsen during movement, and the route through ladders and confined compartments may increase dislodgement, aspiration, or hemodynamic stress.

- Secure the casualty before movement. If spinal concern remains, move in a way that minimizes uncontrolled neck motion without creating dangerous delays.
- Assign roles: one person at the head/airway, one to monitor and assist, one to carry or manage litter movement, one runner if available.

- Bring immediate airway rescue basics during movement: suction if available, oxygen, BVM, and simple adjuncts.
- Reassess before movement starts and immediately after arrival. A patient who was stable at scene may have changed by the end of extraction.

8. Arrival to Sick Bay and Reassessment

Once in Sick Bay, the casualty becomes more lethargic. Speech is slower. The patient now opens eyes only to voice, obeys simple commands inconsistently, and localizes pain. GCS is now 10 to 11. One episode of vomiting occurs. Pupils are still reactive, but one may be slightly more sluggish than earlier depending on how the scenario is run.

This is the inflection point of the case. The issue is no longer just a head injury requiring observation. It is now a deteriorating neurologic casualty who may soon lose airway protection and who requires strict prevention of secondary brain injury.

9. Guided Walkthrough: Expected Management

9.1 Primary Survey Reset in Sick Bay

- Repeat the primary survey from the beginning. Do not assume the scene assessment remains valid.
- Airway: determine whether the casualty can protect the airway, especially after vomiting and declining GCS.
- Breathing: confirm oxygenation and ensure there is no secondary chest issue from the fall.
- Circulation: reassess blood pressure carefully; in TBI, avoiding hypotension is critical.
- Disability: repeat GCS, pupils, and any focal deficits that can be assessed.
- Exposure: look for other missed injuries once the immediate environment is controlled.

9.2 TBI Priorities That Must Be Applied Now

- Prevent hypoxia. Maintain oxygenation aggressively; in this context the goal is to avoid any prolonged desaturation.
- Prevent hypotension. Maintain systolic blood pressure above the neuroprotective threshold used in the main guide.
- Avoid hypotonic fluids. Do not worsen cerebral edema through poor fluid choice.
- Avoid unnecessary hyperventilation. Ventilation should be controlled to target range, not driven down unless true herniation signs appear.
- Elevate the head of bed if feasible and safe once spinal handling priorities are addressed.
- Treat fever if present; avoid adding another secondary brain insult.

9.3 Airway Decision Threshold

Key decision. The central question becomes: is this still a monitor-and-transfer patient, or has the patient crossed into an airway-control problem?

- If GCS continues to fall toward 8 or lower, if the patient cannot protect the airway, if vomiting recurs, or if agitation/decline makes safe transport impossible, the team should prepare for definitive airway control.
- If the casualty remains marginal but still protects the airway, the team must still prepare as if intubation may become necessary soon, rather than waiting until complete loss of control.
- This scenario is designed to reward early preparation, not delayed reaction.

9.4 Example Progression to Airway Control

If the scenario is run as a more severe version, the patient deteriorates further: GCS drops to 7 to 8, the patient no longer follows commands, has recurrent emesis, and shows increasing irregular respirations or worsening airway noise. At that point, the correct transition is from observation to airway pathway.

Expected actions include: pre-oxygenation, airway setup, suction readiness, RSI preparation, strict attempt planning, backup rescue plan stated aloud, and post-intubation confirmation with EtCO2 and clinical checks. If oral intubation is expected to be difficult or fails within the permitted limits, the team must be prepared to convert rapidly to the failed-airway plan rather than making repeated attempts.

9.5 If Herniation Signs Appear

- Recognize warning signs: falling level of consciousness, unilateral dilated pupil, Cushing-type hemodynamic pattern, worsening respiratory pattern.
- Use brief rescue hyperventilation only as a temporizing measure if true impending herniation is suspected.
- Prepare hypertonic saline (or mannitol only if the hemodynamic context is appropriate) according to the thresholds already built into the main guide.
- This is not a wait-and-see moment. It is an escalation trigger and an evacuation trigger.

10. Evacuation Decision Framework

10.1 If Alongside

- A deteriorating head-injured casualty with falling GCS generally should not be kept onboard longer than necessary simply because the ship is alongside.
- If the patient is stable enough to move safely, arrange immediate transfer to the jetty for local ambulance pickup.
- If airway control or immediate stabilization is required before the move, do that first, then transfer once the patient is safe to move.
- The mistake to avoid is delaying transfer for nonessential onboard observation when a shore hospital is accessible.

10.2 If At Sea

- If the patient is worsening and shore access is delayed, early consideration of helicopter hoist becomes appropriate.
- Because the aircraft cannot land on deck, packaging, tube securement, line securement, and movement planning become part of the clinical decision.
- A rapidly worsening neurologic casualty should trigger early teleconsultation and early extraction request rather than waiting until decompensation is complete.
- A short hold may be unavoidable while extraction is arranged, but it should be treated as a bridge, not as a comfortable long-term plan for a worsening TBI.

11. If a Short Hold Is Unavoidable

This case is not intended as the best example of a 72-hour hold, because progressive intracranial deterioration usually pushes toward early transfer. However, weather, distance, or aircraft delay may create a temporary onboard hold. If that happens, the team must convert immediately to organized prolonged-care behavior.

- Set a neuro reassessment rhythm: GCS, pupils, airway status, breathing pattern, blood pressure, oxygenation.
- Track exact times of every medication and every change.
- Document trend, not single values only.
- Maintain clear escalation criteria: worsening GCS, rising oxygen need, signs of herniation, seizure activity, inability to maintain airway safely.
- Re-contact higher support early if the trajectory worsens.

12. Medication Notes

- Analgesia must not obscure worsening neurologic assessment unnecessarily. Use pain control thoughtfully and re-check the exam after administration.
- Sedation becomes a major decision only if the patient is intubated, severely agitated, or requires a procedure. Do not sedate a deteriorating TBI patient casually and then mistake the drug effect for neurologic decline.
- If seizure activity occurs, treat promptly with the seizure pathway doses already defined in the manual.
- If hypertonic therapy is indicated, preparation, administration, and sodium implications must be deliberate, not improvised.

13. Procedure Notes

- Airway procedures are the main procedural branch in this scenario.
- If intubation becomes necessary, the key teaching issue is preparation before collapse: suction, oxygen, monitoring, drugs, backup plan, limited attempts, and immediate confirmation.
- If no airway procedure is needed yet, the correct procedural restraint is to avoid performing one too early without trigger, while still preparing for it in advance.

14. Communication and Team Performance

- State the lead out loud. One person must keep the plan coherent.
- State the current problem list out loud: head injury, falling GCS, airway risk, evacuation planning.
- Use closed-loop communication for medications, equipment, and movement tasks.
- During transfer planning, explicitly say what may fail next: airway, vomiting/aspiration, further drop in GCS, seizure, herniation.
- Document times and hand over the trend clearly if another clinician or team takes over.

15. Common Pitfalls Built Into This Scenario

- Focusing on the scalp laceration and missing the worsening intracranial picture.
- Delaying movement because too many low-yield tasks are attempted in the machinery space.
- Moving too early without stabilizing the immediately dangerous issue first.
- Watching a falling GCS without preparing the airway plan.
- Allowing oxygenation or blood pressure to drift while concentrating only on transport logistics.
- Treating a brief improvement as proof that the patient is stable.
- Waiting too long to request evacuation support.

16. Teaching Side Notes

Side note: scalp wounds can bleed dramatically and visually dominate the scene. In this case, the laceration is important, but it is not the main threat. The main threat is secondary brain injury from delayed recognition, hypoxia, hypotension, and unplanned airway loss.

Side note: a confused, talking casualty can still be on the edge of decompensation. The team should not confuse the presence of speech with durable stability.

Side note: the machinery space environment is intentionally chosen because it forces realistic shipboard thinking. The right answer is rarely to perform an elaborate ICU-style workup in a cramped, noisy space. The right answer is to do the critical actions, then move to a better environment.

Side note: if the scenario is run alongside, the correct lesson is often early transfer. If run at sea, the correct lesson is often early extraction planning plus tight bridge care, not passive observation.

17. What Could Go Wrong Next

- Further drop in GCS with sudden airway loss.
- Recurrent vomiting with aspiration.
- Seizure activity.
- Pupil asymmetry and impending herniation.
- Unrecognized hypotension from associated occult injury or poor resuscitation strategy.
- Deterioration during movement because the team assumed the patient was stable.

18. Key Takeaways

- A worsening head injury is a trend problem before it becomes a collapse problem.
- The scene goal is essential stabilization plus safe extraction, not prolonged compartment-based management.
- The patient should be moved early to the best treatment environment unless an immediate life threat must be addressed first.
- Falling GCS, vomiting, and worsening mentation convert this from observation to airway-risk management.
- If the patient is worsening, evacuation planning should start early - not after complete decompensation.
- In shipboard care, transport logistics, device security, and communication are part of the medical treatment plan.

ACTT Scenario Companion Guide

Scenario 2: Chest Trauma With Suspected Tension Pneumothorax on Upper Deck

Royal Canadian Navy Physician Assistant Focus

This teaching scenario is designed as a guided walkthrough. It begins at the scene, forces decisions about on-scene treatment versus movement, and then continues through Sick Bay management, evacuation planning, and contingency planning if evacuation is delayed.

Learning Objectives

- Recognize the clinical pattern of tension pneumothorax in an unstable casualty without waiting for perfect confirmation.
- Decide what must be done on scene before movement and what can wait until arrival in Sick Bay.
- Execute immediate needle thoracostomy logic, then transition to definitive chest tube planning.
- Plan safe movement of an unstable casualty across the ship using available carry systems.
- Choose among jetty transfer, helicopter hoist, or short shipboard holding based on response to treatment and operational constraints.
- Identify common failure points, including recurrent tension physiology after temporary improvement.

1. Initial Setting

Ship status: At sea in moderate swell, not within immediate helicopter landing capability. The flight deck is red deck only; helicopter extraction is possible only by hoist. The casualty is located on the upper deck after a shipboard work incident involving blunt chest trauma during equipment movement.

Available at scene: one assisting sailor, basic first-response kit, radio contact, oxygen cylinder can be brought, and Stokes litter plus medsled are available if movement is required. Sick Bay has fuller monitoring and procedural capability, including decompression supplies and chest tube setup.

2. Initial Presentation

A sailor is struck in the right lateral chest by shifting equipment during deck work. The casualty is found seated against the bulkhead, anxious, tachypneic, clutching the right chest, and stating, "I cannot catch my breath." The assisting sailor reports the casualty was initially talking normally but became visibly more distressed over the last two to three minutes.

Immediate findings	Operational meaning
Severe shortness of breath and increasing agitation	May reflect hypoxia, rising intrathoracic pressure, pain, or impending decompensation.
Right-sided chest pain and poor chest movement on the right	Supports significant unilateral thoracic injury.
Absent or markedly reduced breath sounds on the right	Strong clue toward tension pneumothorax in this context.
Tachycardia, weak radial pulse, and falling blood pressure trend	Suggests obstructive shock physiology, not just pain.
Neck veins appear distended despite respiratory	Further supports tension physiology if visible.

distress	

Teaching point: this is a clinical diagnosis. In an unstable casualty with compatible mechanism and findings, you do not wait for imaging, auscultation perfection, or transport to Sick Bay before deciding whether decompression is required.

3. Immediate Scene Priorities

1. Ensure the scene is safe enough to work and that the casualty is no longer in immediate danger from shifting gear or ongoing deck hazards.
2. Perform a rapid ABC check with primary emphasis on airway patency, ability to oxygenate, and signs of obstructive shock.
3. Call for immediate assistance to bring oxygen, decompression kit, and movement equipment.
4. Place the casualty on supplemental oxygen as soon as it is physically possible.
5. Decide whether tension physiology is present strongly enough that decompression must occur before movement.

Operational tip: if the casualty is deteriorating rapidly and the transport route is long, awkward, or requires lifting, decompression may be the intervention that makes movement survivable. Moving first without treating the chest can convert a critically ill casualty into an arrest during transport.

4. Decision Point 1: Treat on Scene or Move Immediately?

Best teaching answer: this casualty should be treated on scene first if the decompression kit can be brought quickly. The combination of respiratory distress, unilateral findings, and shock indicators makes suspected tension pneumothorax the immediate life threat. Needle thoracostomy is a rapid, high-yield intervention that should not be delayed simply to relocate the patient.

Option	Why it may be chosen	Main risk
Immediate on-scene decompression	Addresses likely life threat before movement.	Requires correct landmarking and equipment at scene.
Rapid movement without decompression	May seem faster if Sick Bay is close and crew are already mobilized.	Casualty may arrest or worsen during transfer.
Attempt prolonged assessment before deciding	A common but unsafe tendency when uncertain.	Dangerous delay while tension physiology progresses.

5. Guided Walkthrough: On-Scene Intervention

Call the diagnosis early

State aloud: "This may be tension pneumothorax with shock. Prepare immediate decompression." This aligns the team and prevents delay.

Apply oxygen

High-flow oxygen if available. Even if the chest intervention is the key fix, oxygen buys time and supports the injured lung.

Expose and identify the side

Confirm the affected side clinically and deliberately. Avoid wrong-side decompression.

Landmark carefully

Use either the 2nd intercostal space mid-clavicular line or the 4th/5th intercostal space anterior/mid-axillary line, depending on access and body habitus. In many adults, the lateral approach is more practical and reliable.

Needle thoracostomy

Use a 14-gauge, 3.25-inch catheter. Insert over the superior rib margin to reduce neurovascular injury risk.

Reassess immediately

Look for air release, improved work of breathing, improved pulse strength, improved mentation, and improved blood pressure.

If there is little or no improvement, do not assume the problem is solved. Recheck landmarking, consider catheter failure, consider bilateral injury if the mechanism supports it, and broaden the differential to include hemothorax, cardiac tamponade, or other major chest injury.

6. Decision Point 2: How to Move the Casualty

Once immediate decompression has been attempted and the casualty is marginally more stable, the next decision is movement. The casualty still requires monitoring, likely definitive treatment, and a protected clinical environment. In most cases, transfer to Sick Bay remains appropriate after the initial life threat is addressed.

- Use the Stokes litter if the route is awkward, the casualty is unstable, or there is risk of sudden deterioration.
- Use the medsled if the route and configuration make a lower-profile drag or slide safer.
- Secure oxygen, any lines, and the decompression site before movement.
- Assign one person specifically to airway and breathing observation during transport, not just lifting.
- Reassess immediately before movement starts and again immediately on arrival.

Teaching point: in real shipboard movement, the procedure is not over once the catheter is in. Movement itself is a high-risk period for re-tension, line pullout, loss of monitoring, and loss of situational awareness.

7. Arrival in Sick Bay and Secondary Management

On arrival in Sick Bay, do not assume the casualty is stable because they survived transport. This is where the temporary fix must be converted into a definitive plan.

6. Repeat primary survey immediately.
7. Confirm persistent improvement or persistent instability after needle decompression.
8. Place on full monitoring if available: SpO2, cardiac monitoring, blood pressure cycling, and EtCO2 if airway support escalates.
9. Establish vascular access. If peripheral IV fails and the casualty is unstable, move to IO early rather than wasting time.
10. Prepare for chest tube thoracostomy if clinical suspicion remains high, if the casualty re-deteriorates, or if this was a true tension pneumothorax that has only been temporized.

Definitive chest tube logic: needle thoracostomy is a temporizing intervention. A chest tube is the definitive pleural drainage procedure and should be prepared early once the casualty is in a setting where it can be performed safely.

8. Procedure Focus: Transition to Chest Tube Thoracostomy

- Likely indication: persistent pneumothorax, recurrent tension physiology, or need for definitive pleural decompression after successful needle thoracostomy.
- Likely site: 5th intercostal space near the midaxillary line, with deliberate landmarking.
- Core sequence: prep, incision, blunt dissection over the superior rib margin, pleural entry, finger sweep, tube advancement, connection to drainage, securement, and immediate reassessment.
- The key mental shift: a successful needle decompression should trigger definitive planning, not false reassurance.

9. Decision Point 3: Jetty Transfer, Helicopter Hoist, or Hold?

The correct answer depends on location, weather, response to treatment, and how stable the casualty remains after definitive management. This scenario is ideal for teaching that evacuation choice is dynamic, not fixed at the first decision.

Option	When it fits	Advantages	Main concern
Jetty ambulance transfer	If alongside or approaching berth and casualty is unstable but transport is immediately achievable.	Fast handoff to shore system without hoist complexity.	Delay if berth access is not actually immediate.
Helicopter hoist	If at sea, urgent extraction is justified, and air asset timing is acceptable.	Faster off-ship transfer than prolonged holding in high-acuity cases.	Packaging, weather, and hoist movement can destabilize chest devices and airway.
Short hold onboard	If casualty stabilizes after chest tube, weather blocks hoist, and transport delay is unavoidable.	Allows controlled monitoring while awaiting safer extraction window.	Requires disciplined monitoring for re-tension, bleeding, and shock recurrence.

Teaching answer in most versions of this case: if the casualty remains unstable, needs escalating oxygen, or re-deteriorates, this is an urgent evacuation problem. If the casualty improves significantly after chest tube placement and remains hemodynamically acceptable, a short shipboard hold while arranging extraction may be reasonable, but only with a clear monitoring plan and explicit escalation triggers.

10. Medication Notes

- Analgesia: pain control matters, but avoid creating respiratory depression in a casualty who is already borderline. Titrate carefully and reassess after each dose.
- Procedural analgesia/sedation: if the casualty needs chest tube placement and is conscious, choose the safest achievable analgesia plan based on respiratory status, monitoring capacity, and the need to preserve spontaneous ventilation if possible.
- Do not let analgesia delay decompression in an unstable tension pneumothorax. Life threat first, comfort second.
- If hypotension persists after decompression, reassess whether the casualty has additional pathology rather than reflexively treating this as pain alone.

11. Team, Communication, and Handover Teaching Points

- A clear clinical lead must call the likely diagnosis early.

- One person should be tasked specifically with respiratory observation during movement.
- Before movement, state aloud what may fail next: recurrent tension, worsening hypoxia, or circulatory collapse.
- If seeking teleconsultation or preparing evacuation handover, give a concise sequence: chest trauma mechanism, worsening respiratory distress, on-scene decompression performed, current response, current oxygen need, current hemodynamics, and whether a chest tube has been placed.

12. Side Notes, Tips, and Common Pitfalls

Do not wait for certainty

Tension pneumothorax is treated on suspicion when the casualty is unstable. Waiting for perfect confirmation is a classic error.

Do not misread brief improvement as full resolution

A temporary catheter can kink, fail, or only partially decompress. The patient may worsen again.

Do not forget the move itself is hazardous

Many shipboard teams perform the right intervention, then lose the gain during transport because no one is assigned to reassess.

Do not stop at the first diagnosis if the casualty stays shocked

A persistent shock state after decompression may mean hemothorax, cardiac injury, or another cause is also present.

13. What Could Go Wrong Next?

- Recurrent tension physiology due to failed or inadequate decompression.
- Chest tube malfunction, blockage, or dislodgement after initial placement.
- Worsening shock from associated hemorrhage.
- Hypoxia during movement or hoist preparation.
- Pain, agitation, or sedation-related respiratory decline if medication is given without adequate monitoring.

14. Model Clinical Summary

This casualty has a high-probability tension pneumothorax after chest trauma and should be managed as an unstable obstructive-shock chest emergency. Immediate on-scene decompression is the correct first major action when equipment can be brought quickly. Once partially stabilized, the casualty should be moved to Sick Bay for full reassessment and likely chest tube thoracostomy. Evacuation urgency depends on response to definitive treatment, but recurrence risk and transport risk remain high throughout. If evacuation is delayed, the hold plan must include repeated respiratory reassessment, chest device checks, oxygen planning, pain control, and explicit escalation triggers.

15. Key Takeaways

- In unstable chest trauma, tension pneumothorax is a clinical diagnosis that must be treated promptly.
- Needle thoracostomy may need to occur before movement if the casualty is deteriorating.
- Temporary improvement does not equal definitive treatment; plan for chest tube early.

- Movement across the ship is part of the clinical risk, not just logistics.
- Evacuation decisions must be revisited after each major change in the casualty's response.

Scenario 3: Major Burn With Inhalation Risk in a Shipboard Fire Response

Hybrid teaching case with staged decision points, guided walkthrough, operational notes, and shipboard evacuation planning

Scenario snapshot

Primary domains	Burns, airway management, analgesia/sedation, shock, prolonged holding, shipboard movement, evacuation decision-making
Core procedures discussed	Possible early intubation, oxygen therapy, IV/IO access, Foley placement, burn dressing basics, transport packaging
Main evacuation branches	Jetty ambulance if alongside, helicopter hoist if at sea, or prolonged hold up to 72 hours
Primary teaching hazard	Waiting too long to secure an airway in a burn casualty with progressive edema
Best used for	Guided walk-through, table-top discussion, or individual rehearsal before ACTT training

Learning objectives

- Recognize when initial fire-scene actions must happen before movement to Sick Bay.
- Identify airway warning signs that support early definitive airway planning in burns and smoke exposure.
- Use the Rule of 10s as an initial fluid starting point, then adjust using urine output and clinical response.
- Decide between immediate local transfer, hoist extraction, or prolonged shipboard holding.
- Anticipate the ongoing workload created by a burned, potentially intubated casualty over the next several hours.

Initial setting

The ship is at sea in cold conditions, several hours from a practical port diversion. During a small machinery-space fire, a sailor is exposed to heat and smoke while assisting with boundary cooling before the space is made safe. He is removed from the compartment and found sitting against a bulkhead, anxious, in pain, and coughing black-tinged sputum. A damage-control sailor and another crew member are already with him. You are called to the scene with a portable medical bag, oxygen, and radio support, but the full Sick Bay setup is not yet at the casualty location.

Initial presentation

- Alert but frightened, speaking in short sentences.
- Facial burns with singed nasal hairs and soot around the mouth.
- Hoarse voice, persistent cough, and increasing throat discomfort.
- Partial-thickness burns across the anterior chest, upper arms, and neck; scattered burns to both hands.
- Vitals on first check: HR 122, RR 28, BP 108/68, SpO2 93% on room air, pain 9/10.
- No obvious major external hemorrhage, but he is progressively more restless.

Phase 1: Immediate scene priorities

Decision point 1: What must happen where he is found, before you think about moving him?

- Stop the burn process: ensure no smoldering clothing remains and remove heat source exposure.
- Rapid airway and breathing assessment: the combination of facial burns, soot, hoarseness, and cough strongly raises concern for inhalation injury.

- Apply supplemental oxygen immediately. In this scenario, high-concentration oxygen is appropriate early while you assess trajectory.
- Expose only as needed for assessment, then protect from heat loss; burned casualties lose temperature control quickly.
- Obtain quick burn estimate, not because it must be perfect now, but because size drives your fluid planning soon.

Guided teaching note: At this stage, the wrong move is to focus on dressings first while underestimating the airway. Burn dressings matter, but in an airway-threatening burn casualty, airway trajectory is often the highest-risk problem. You are trying to answer one question early: is this a patient whose airway may be significantly worse by the time he reaches Sick Bay?

Scene decision: move now or treat longer on scene?

The casualty is not yet peri-arrest, but the environment is poor for sustained care. If the route to Sick Bay is practical and the patient can be moved with oxygen and monitoring support, the preferred approach is brief scene stabilization followed by prompt movement. Do not delay excessively on scene once you have addressed immediate threats and established a movement plan. The exception would be a rapidly failing airway that demands intervention before movement.

Phase 2: Movement to Sick Bay

- Package with airway access preserved. Avoid burying the head/neck in dressings that make reassessment harder.
- Use a totable medsled or other practical shipboard movement device if the route is narrow or awkward. Movement should be deliberate because pain, line dislodgement, and airway decline can all worsen en route.
- Assign roles before moving: one at the airway/head, one managing oxygen/monitoring, one managing navigation and route clearance, one additional helper if available.
- Bring suction, airway kit, and at least one backup oxygen source if the route is prolonged or difficult.

Teaching note: A common shipboard error is moving a high-risk casualty as if movement itself is neutral. At sea, movement can create new instability. The route is part of the medical plan, not a separate logistic detail.

Clinical drift during movement

Halfway to Sick Bay, the patient becomes more hoarse, develops louder coughing, and now struggles to speak full phrases. SpO2 drops to 91% despite oxygen. He is more agitated and repeatedly reaches toward his neck and mask.

Decision point 2: Do you continue straight to Sick Bay, pause, or secure the airway before arrival?

In this case, if Sick Bay is only moments away and the team can continue moving safely with constant airway watch, movement should continue while the airway kit is prepared for immediate use on arrival. If access is delayed, the route is hazardous, or the patient is visibly losing the airway now, the threshold for intervening before arrival drops. The key principle is early airway planning before edema turns a manageable airway into a failed airway.

Phase 3: Sick Bay reassessment and early management

On arrival, the casualty is placed on monitor and exposed for a more deliberate assessment. Estimated burn size is roughly 24% TBSA involving anterior chest, neck, bilateral upper arms, and both hands. He now has inspiratory noise, worsening hoarseness, and persistent soot-stained secretions. Vitals: HR 128, RR 32, BP 104/66, SpO2 94% on oxygen, pain 9/10.

Immediate priorities in Sick Bay

- Reassess airway aggressively. This patient is not yet in extremis, but the pattern strongly supports progressive airway edema risk.
- Establish vascular access early. Large-bore IV is preferred; IO is acceptable if IV is delayed and the patient is deteriorating.

- Begin analgesia, but choose drugs with awareness that airway risk may soon escalate. Any sedative or opioid must be paired with airway monitoring readiness.
- Calculate initial burn fluid rate using the Rule of 10s: 24% TBSA x 10 = 240 mL/hr as the starting point for an adult 40-80 kg, then adjust based on response.
- Place Foley when appropriate so urine output can become your main bedside resuscitation guide.

Decision point 3: Intubate now or watch longer?

This is the central teaching decision in the scenario. The safer teaching answer is early intubation now, before swelling progresses. The supporting signs are facial burns, soot, hoarseness, worsening voice, increasing work of breathing, and expected delayed edema. Waiting for obvious collapse is unsafe. In many burn casualties, the best time to intubate is before the airway becomes anatomically difficult.

Guided walkthrough: If the airway is secured early

Step 1: Pre-brief the team. State clearly that the indication is progressive airway threat from burn and inhalation injury, not current complete obstruction. Name the operator, medication support, monitor/recorder, and backup plan.

Step 2: Prepare full RSI setup. Suction, oxygen, ETT, bougie, confirmation tools, backup airway devices, and surgical airway kit should all be immediately available. In burn airways, a failed plan develops faster than in routine airways.

Step 3: Pre-oxygenate and monitor closely. The patient may still oxygenate reasonably now; use this window.

Step 4: Perform RSI using your preferred protocol and current ship capability. If difficulty is encountered, do not burn through repeated attempts while swelling and trauma worsen the anatomy.

Step 5: Confirm placement with EtCO2 and full clinical confirmation. Then secure the tube with cotton ties or another non-adhesive method appropriate for burned skin. Standard adhesive tape is unreliable on weeping or burned tissue.

Step 6: Start post-intubation sedation and analgesia immediately. A technically successful intubation without sustained sedation creates awareness, agitation, and high risk of accidental extubation.

Guided walkthrough: Circulation and burn resuscitation after airway control

- Start isotonic crystalloid at the calculated initial rate. The formula is a starting point only, not a fixed order for the next several hours.
- Use urine output target 30-50 mL/hr in an adult as the primary bedside resuscitation endpoint, with rate changes of roughly 25% up or down if output is persistently low or high.
- Avoid fluid creep. Burn casualties can become more edematous, harder to ventilate, and harder to transfer if fluid is poured in without repeated reassessment.
- Watch the neck and chest burns for progressive tightness. Circumferential compromise becomes a later procedural problem if missed early.
- Manage pain deliberately. Even intubated burn patients require ongoing analgesia; sedation alone is not pain control.

Medication integration

Analgesia

- If not yet intubated and still maintaining the airway, low-dose ketamine for pain is often attractive because it supports analgesia without the same degree of hypotension risk as some alternatives. However, any sedative/analgesic can still complicate airway monitoring in a burn casualty.
- Opioids may still be used, but their respiratory burden must be weighed carefully if the airway is not yet secured.

Airway medications

- Use your shipboard RSI medications per established protocol. The central teaching point is not a novel drug choice; it is the timing of the airway decision.

- Once intubated, post-intubation sedation should be continuous or deliberately re-dosed on schedule. Do not wait for severe agitation to restart sedation.

Supportive medications

- Ondansetron may be useful if nausea complicates analgesia or movement.
- If soot and secretion burden are high, suction planning matters as much as drug choice.

Procedure notes and practical tips

- Airway before edema: this is the major procedural lesson. Early control is often easier, safer, and less traumatic than late rescue.
- Tube securement in burns: use ties, not reliance on adhesive tape alone.
- Foley early if the casualty is a true burn resuscitation patient; without urine output, your fluid titration becomes much less reliable.
- Dressings should protect, reduce contamination, and avoid obstructing reassessment. They should not delay airway, fluids, or evacuation planning.

Evacuation branch planning

Branch A: Alongside with local ambulance available

If the ship is alongside and local ambulance response is practical, the priority becomes early transfer after initial stabilization. In a significant inhalation injury with a secured or threatened airway, local transfer should not be delayed for low-yield onboard tasks. The aim is safe packaging, concise handover, and timely off-ship movement.

Branch B: At sea with helicopter hoist required

If at sea, helicopter extraction may still be preferred, but hoist preparation adds time, movement, and equipment-security demands. The casualty must be packaged to tolerate movement with airway devices, oxygen, lines, and dressings secured. A hoist is not just a transport issue; it increases the importance of tube security, sedation continuity, and concise handover.

Branch C: Hold up to 72 hours

If weather, sea state, or distance prevent timely evacuation, the scenario converts into a prolonged-hold burn case. That immediately raises the workload: repeated urine-output-guided titration, airway surveillance, sedation/analgesia continuity, temperature control, device checks, wound reassessment, and early teleconsultation. This is a survivable branch, but only if the team treats it as an active care plan, not as a waiting period.

What could go wrong next

- Delayed airway edema if the team waits too long to intubate.
- Accidental extubation if the tube is secured poorly on burned skin.
- Fluid overload with worsening edema and ventilation burden if the formula is treated as fixed and not titrated.
- Under-resuscitation if urine output is not tracked or the Foley is nonfunctional.
- Pain and agitation causing self-harm, device dislodgement, or loss of team control.
- Heat loss and secondary physiologic deterioration if exposure is not managed.

Communication and handover points

- State the problem list clearly: major burns, inhalation injury risk, airway secured or high risk, burn resuscitation underway, analgesia/sedation needs, evacuation status.
- Document exact times of airway change, intubation if performed, fluid start rate, Foley placement, urine output, key medication doses, and trend changes.
- If consulting remotely, have ready: estimated TBSA, airway findings, current airway status, current fluid rate, urine output trend, vitals, and the realistic shipboard limits.

Side notes and teaching pearls

- In burn cases, the airway can look acceptable just before it becomes difficult. That is why trend and anticipation matter more than a single reassuring moment.
- The Rule of 10s is a practical entry point, not a substitute for reassessment.
- A burn casualty who is intubated but poorly sedated is not stabilized; the plan is incomplete.
- Movement on the ship should be thought of as a medical intervention with risks, not just a transport chore.

Key takeaways

- Recognize inhalation injury early and decide on airway control before edema worsens.
- Use rapid scene priorities, then move deliberately to the best treatment location without unnecessary delay.
- Start burn fluids with a formula, then let urine output and clinical response drive adjustments.
- Plan evacuation and prolonged holding early; the transport branch changes the workload immediately.
- In shipboard burn care, anticipation prevents the most dangerous failures.

ACTT Scenario Companion Guide

Scenario 4: Septic Shock in a Sailor With Infection and Delayed Evacuation

Royal Canadian Navy Physician Assistant Focus

This teaching scenario is written as a hybrid case: narrative progression, staged decision points, guided walkthrough, and instructor-style notes. It is designed to force bedside decisions in the shipboard environment from first recognition through ongoing treatment, evacuation planning, or prolonged holding.

1. Learning Objectives

- Recognize sepsis and septic shock early in a sailor with evolving systemic illness.
- Decide what can be done at the scene, what should wait until Sick Bay, and when movement itself creates risk.
- Start a sepsis plan that is practical for the shipboard environment: access, fluids, antibiotics, reassessment, and pressor support.
- Balance fluid resuscitation with the risk of worsening respiratory status in a limited-resource setting.
- Decide between jetty transfer, hoist extraction, or holding the patient up to 72 hours when evacuation is delayed.
- Use clear communication, documentation, and teleconsultation to support prolonged casualty management.

2. Initial Setting

- Operational context: the ship is at sea in deteriorating weather, with flight operations uncertain for several hours.
- Location: the casualty is initially in berthing after feeling progressively unwell during the previous watch cycle.
- Available medical assets: Sick Bay, routine oxygen, IV and IO access capability, limited point-of-care testing, onboard formulary, and one infusion pump immediately available.
- Personnel at first contact: one duty medic, one assisting sailor, and the PA responding from Sick Bay.
- Likely operational problem: the patient appears ill enough to need escalation, but evacuation timing is not guaranteed.

3. Initial Presentation

At 0215, a 31-year-old sailor is reported to be 'shaking, weak, and not making sense' in berthing. Shipmates state that he had a sore throat and cough for the last day, skipped part of supper, and became more lethargic over the last two hours. On arrival, he is sitting forward on the bunk, flushed, diaphoretic, and speaking in short answers. He looks ill, is slow to respond, and says he feels cold despite feeling hot to the touch.

Initial bedside observations in berthing:

- Airway patent, able to speak, no obvious obstruction.
- Respiratory rate 28/min, shallow but not immediately failing, SpO2 93% on room air.
- Heart rate 126/min, regular.
- Blood pressure 92/56 mmHg.
- Temperature 39.2 C.
- Capillary refill about 4 seconds; skin warm but mottled at the knees.
- He is oriented to person but slow on place and time.

- No obvious major trauma. No chest pain. Cough is productive. He reports right-sided pleuritic chest discomfort.

4. Immediate Scene Priorities

- Confirm this is a medical deterioration with possible shock, not just uncomplicated fever.
- Address airway and oxygenation first, but do not overfocus on airway if the immediate problem is evolving circulatory failure.
- Recognize early red flags for sepsis and septic shock: fever, altered mentation, tachycardia, hypotension, poor perfusion, and respiratory stress.
- Start simple measures that change outcome now: oxygen, immediate reassessment, and rapid plan for vascular access and movement.
- Decide quickly whether the patient is safe to move to Sick Bay now or whether immediate treatment in berthing must occur first.

5. Decision Point: Treat on Scene vs Move Now

This patient is sick enough that treatment should begin where he is found, but he is not in immediate airway arrest and does not require a major invasive procedure before movement. The correct operational decision is usually a short on-scene intervention followed by rapid movement to Sick Bay.

- Treat on scene first if the intervention is fast and improves safety for movement: oxygen, first set of vital signs, and at least one attempt at IV access if it can be done without significant delay.
- Move early because the patient may need repeated reassessment, antibiotics, fluid titration, pressor support, monitoring, and possible teleconsultation.
- Do not remain in berthing trying to complete a full sepsis workup; the location is poor for sustained monitoring and escalation.

6. Immediate On-Scene Actions

- Apply oxygen by face mask or nasal route sufficient to improve SpO2 and reduce work of breathing.
- Reassess mental status, respiratory effort, perfusion, and blood pressure after oxygen is applied.
- Obtain point-of-care blood glucose if immediately available, because altered mentation should not be attributed to sepsis alone without excluding hypoglycemia.
- Attempt IV access if quickly achievable; if repeated failure or difficult environment delays care, move now and establish access in Sick Bay.
- Package the casualty for movement with assistance; do not let him walk unassisted.

Teaching note: This is a common shipboard trap. A septic patient can still appear 'talking and awake,' which can falsely reduce urgency. The combination of altered mentation, hypotension, tachycardia, fever, and poor capillary refill should already move the team into a shock mindset.

7. Movement to Sick Bay

- Use enough personnel to support the patient physically and avoid collapse en route.
- Bring oxygen, basic airway kit, and a way to monitor the patient immediately on arrival.
- If the patient worsens during movement, be prepared to stop, reassess, and treat airway or circulatory deterioration before continuing.
- Document time of first clinical contact and first abnormal vital signs; exact timing matters later for antibiotic window tracking and handover.

8. Sick Bay Reassessment

At 0225, the patient reaches Sick Bay. Oxygen has improved SpO2 to 96%, but he still looks ill and has become more drowsy. Repeat observations now show: HR 132, BP 86/50, RR 30, temperature 39.3 C, and delayed capillary refill. Lung exam reveals coarse crackles at the right base. He is not yet peri-arrest, but he is clearly trending worse.

- This is now a high-probability septic shock picture until proven otherwise.
- The likely source is pneumonia, but the early treatment plan should not wait for perfect certainty.
- The patient needs immediate access, fluid resuscitation, antibiotic planning, and close reassessment.

9. Primary Clinical Problem List

- Probable sepsis with evolving septic shock.
- Hypotension with poor perfusion.
- Altered mental status likely due to systemic illness and reduced perfusion; other causes still remain possible but less likely.
- Possible lower respiratory source, likely pneumonia.
- Risk of worsening respiratory function if fluid is given aggressively without reassessment.
- Potential need for vasopressors if hypotension persists after initial fluid resuscitation.

10. Guided Walkthrough: Initial Management

10.1 Access and Monitoring

- Place the patient on monitor immediately: SpO2, BP cycling, and cardiac rhythm.
- Establish IV access rapidly. If IV fails and the patient is deteriorating, transition early to IO rather than wasting time.
- Obtain initial bloodwork or point-of-care studies only if this does not delay treatment. In this case, treatment should not wait for results.
- Insert a Foley catheter if prolonged monitoring is likely and shock is significant enough that urine output will guide management.

10.2 Fluids

An initial crystalloid bolus is appropriate because the patient is hypotensive and poorly perfused. A reasonable first move is a measured fluid bolus, followed by immediate reassessment rather than blind repeated boluses.

- Start an initial crystalloid bolus. In formal sepsis frameworks, 30 mL/kg over the first 3 hours may be used when tolerated, but shipboard practice still requires condition-by-condition reassessment.
- After each bolus, reassess blood pressure, capillary refill, mental status, work of breathing, oxygen needs, and lung exam.
- If oxygen requirement rises, crackles worsen, or respiratory distress increases, do not continue giving fluid reflexively.

10.3 Antibiotics

Antibiotics should be started within 1 hour of recognition of severe sepsis or septic shock. Given this presentation, a source-directed empiric regimen for pneumonia is reasonable.

- If pneumonia is the leading source: ceftriaxone plus azithromycin is a practical empiric choice.
- If the source is truly unclear and the patient is unstable: a broader unknown-source regimen such as ceftriaxone plus metronidazole may be used depending on the clinical picture.
- If blood cultures are obtainable without delaying treatment, obtain them first. If not, prioritize antibiotics.

10.4 Reassessment After Initial Bolus

After the first fluid bolus, suppose BP rises briefly to 94/58, but 10 minutes later falls again to 88/52. The patient remains tachycardic, still confused, and now requires more oxygen to maintain saturation. This is not stable improvement; it is transient response with ongoing shock.

- This should trigger a second structured reassessment, not automatic repeated large fluid boluses.
- At this point, the clinician should actively consider whether the patient is becoming fluid-limited and may need vasopressor support.
- This is where trend recognition matters more than a single 'better' blood pressure.

11. Decision Point: When to Start Vasopressors

If the patient remains hypotensive with poor perfusion after reasonable initial fluid resuscitation, norepinephrine becomes the preferred next step. Onboard realities matter: pressor use increases monitoring burden, requires reliable access, and raises the question of whether the patient can still be safely held.

- Target MAP is at least 65 mmHg as a practical minimum in septic shock.
- Start norepinephrine when hypotension persists after initial resuscitation and there is evidence the patient remains underperfused.
- Use an infusion pump if available. Central access is preferred in ideal settings, but peripheral administration may be necessary as a bridge if carefully monitored.
- If using a peripheral line, someone must explicitly own IV site checks for extravasation and tissue injury.

12. Medication Focus for This Scenario

12.1 Suggested Empiric Regimen

- Probable pneumonia: ceftriaxone 2 g IV plus azithromycin 500 mg IV.
- If source unclear and concern remains broad: ceftriaxone plus metronidazole may be considered depending on abdominal or unknown-source features.
- Record exact administration times; the antibiotic clock matters in both teaching and real care.

12.2 Norepinephrine Use

- Start with a practical initial infusion dose and titrate to effect rather than chasing a single static number.
- Reassess BP, perfusion, mental status, urine output, and IV site frequently.
- Be alert for extravasation. If it occurs, stop the infusion at that site and treat promptly.

12.3 Antipyresis and Supportive Medications

- Acetaminophen may help reduce fever burden and discomfort, but it does not replace sepsis treatment.
- Avoid unnecessary sedatives in a patient whose mental status may already worsen with shock.
- Treat nausea or vomiting if present, but do not allow secondary medications to distract from shock management.

13. Evacuation Decision Framework

13.1 If Alongside

- This patient likely warrants urgent transfer to the jetty for local ambulance pickup after immediate stabilization steps have begun.
- If the patient is pressor-dependent, severely unstable, or requiring high oxygen support, transfer should not be delayed for minor onboard optimization.

- Stabilize enough for movement, then move early.

13.2 If At Sea With Hoist Only

- If helicopter hoist is the only extraction route and weather causes delay, immediate full evacuation may not be possible.
- The team must continue active treatment while preparing the patient for possible hoist once available.
- Packaging, line securement, and maintaining a simplified but durable monitoring plan become part of the clinical treatment, not a separate logistic issue.

13.3 If Evacuation Is Delayed Up to 72 Hours

- Convert from an acute response into a structured prolonged hold.
- Define reassessment intervals for vitals, perfusion, mental status, oxygen requirement, urine output, and IV site/device function.
- Maintain antibiotic schedule precisely.
- Track cumulative fluids in and urine out.
- Review whether the current pressor plan is sustainable with available personnel and monitoring.

14. Teleconsultation Trigger

This is a strong scenario for early teleconsultation, especially once the patient shows refractory hypotension, rising oxygen need, or pressor dependence. The call should not wait until the patient is peri-arrest.

- Be ready to provide: suspected source, vital sign trend, current oxygen requirement, total fluids given, antibiotic timing, pressor status, urine output, and current shipboard limitations.
- Specific questions should include whether current source coverage is adequate, whether higher perfusion targets are needed, whether additional diagnostics would change management, and whether continued onboard holding remains acceptable.

15. Side Notes and Instructor Teaching Points

- Do not let a brief BP bump after fluids create false reassurance. Septic shock often shows transient improvement before drifting again.
- In limited-resource care, the most dangerous error is not always doing too little; it is doing the same thing repeatedly without reassessment.
- Antibiotic timing is part of resuscitation in sepsis. It is not a secondary task to do 'later when things settle down.'
- A pressor decision is also a manpower decision. Starting norepinephrine means you must be able to monitor what you started.
- When a ship cannot evacuate promptly, the clinical team must think in timelines: what can fail in the next 30 minutes, next 6 hours, and next 24 hours?

16. Common Pitfalls in This Scenario

- Treating the case as simple fever or dehydration instead of recognizing evolving shock.
- Delaying antibiotics while waiting for diagnostic certainty.
- Continuing large fluid boluses despite worsening respiratory burden.
- Starting vasopressors without assigning line monitoring responsibility.
- Failing to define a clear escalation threshold if the patient becomes more oxygen- or pressor-dependent.
- Poor documentation of medication times, fluid totals, or reassessment findings during a prolonged hold.

17. Example Reassessment Plan for a Delayed Hold

- Continuous or near-continuous monitoring while unstable.
- Repeat focused reassessment after every bolus, pressor change, or visible clinical change.
- Document at regular intervals: HR, BP/MAP, RR, SpO2, oxygen device and flow, mental status, capillary refill/perfusion, temperature, urine output, and IV/pressor site checks.
- Recheck lung exam and work of breathing frequently because fluid-associated respiratory decline may be the next major problem.
- Maintain a running medication record: antibiotics given, antipyretics, antiemetics, total crystalloid, and pressor dose changes.

18. Model Handover Summary

31-year-old sailor with probable septic shock, likely pneumonia source. Found in berthing febrile, confused, tachycardic, hypotensive, and poorly perfused. Oxygen started on scene, moved rapidly to Sick Bay. Received initial crystalloid bolus with only transient pressure response. Empiric antibiotics started within the first hour. Now remains hypotensive with persistent perfusion deficit and increasing oxygen requirement; norepinephrine has been started and is being titrated. Current concerns are worsening septic shock, respiratory decline with further fluid loading, and ability to sustain pressor monitoring onboard if evacuation remains delayed. Next priority is continued reassessment, early teleconsultation, and immediate escalation if oxygen or pressor requirements rise further.

19. Key Takeaways

- Recognize septic shock early from the whole pattern, not a single number.
- Start treatment where found, but move early to the place where sustained care can actually happen.
- Give fluids deliberately, not automatically.
- Start empiric antibiotics early and document exact timing.
- Use norepinephrine when hypotension persists after initial resuscitation, but only with a monitoring plan.
- In delayed evacuation, convert quickly from resuscitation mindset to organized prolonged-care mindset.
- Trend recognition, communication, and handover are as important as the first intervention.

20. Suggested Self-Test Questions

- What findings in this case make septic shock more likely than simple febrile illness?
- What should be done immediately in berthing, and what should wait until Sick Bay?
- How would worsening crackles and rising oxygen requirement change your fluid plan?
- What information must be ready before teleconsultation?
- At what point does this case become unsafe to continue holding onboard?

ACTT Scenario Companion Guide

Scenario 5: Combative Casualty With Possible Hypoxia, Hypoglycemia, or Head Injury

Royal Canadian Navy Physician Assistant Focus

1. Learning Objectives

- Recognize that agitation or violence may be the presenting sign of a medical emergency rather than a purely behavioral issue.
- Apply a safe sequence of verbal de-escalation, physical control, chemical restraint, reassessment, and escalation to airway control when required.
- Identify hidden causes of combative behavior, especially hypoxia, hypoglycemia, traumatic brain injury, sepsis, intoxication, or delirium.
- Decide what must be done at the scene, what can wait until movement to Sick Bay, and when transfer itself creates unacceptable risk.
- Integrate medication choice, monitoring burden, and shipboard manpower limits into the care plan.
- Plan evacuation or prolonged holding based on response to treatment, clinical drift, and the ability to monitor safely over time.

2. Initial Setting

The ship is at sea in moderate weather. Flight operations are possible for a hoist extraction, but the aircraft cannot land on deck. The casualty is in a machinery-adjacent compartment on a lower deck. Passageways are narrow, noise is significant, and the compartment is warm. Two sailors are trying to keep the patient from striking himself and others. Sick Bay is available, but moving the patient will require coordinated packaging and control.

- Available immediately: Royal Canadian Navy PA, one medic/assistant, one duty officer, several non-clinical sailors, Stokes litter, medsled, oxygen, glucometer, IV/IO kit, ketamine, midazolam, soft restraints, hard restraints if required, suction, monitor, and basic airway equipment.
- Not immediately available at scene: full procedural setup, complete documentation station, or ideal lighting.
- Key operational tension: the patient is unsafe where he is, but moving an uncontrolled patient through tight passageways can worsen injury and endanger the team.

3. Initial Presentation

A 34-year-old sailor is reported to be "going wild" after being found sitting on the deck near a ladder well. Witnesses state he may have slipped earlier, but nobody saw the exact mechanism. He is diaphoretic, shouting incoherently, swatting at helpers, and trying to stand. One sailor reports he "hit his head" and seemed briefly dazed. Another reports he had complained of not feeling well during the watch. There is no clear history of intoxication.

- He is pale, sweaty, and intermittently aggressive.
- He will not answer direct questions coherently.
- He is moving all limbs but is poorly cooperative.

- He repeatedly tries to pull away and lunge toward the hatch.
- There is a small scalp abrasion over the right temple.
- No obvious massive external bleeding is seen.

4. Immediate Scene Priorities

This is a safety and medical control problem at the same time. The first task is to prevent immediate harm while rapidly identifying reversible causes that will change management within seconds to minutes.

- Protect the patient from falls, strikes, and further head trauma.
- Protect the team from assault or uncontrolled movement.
- Rapidly assess whether the patient is oxygenating, perfusing, and likely to lose airway control.
- Look for clues that this is driven by hypoxia, hypoglycemia, head injury, sepsis, intoxication, or another cause of altered mental status.
- Determine whether the patient can be calmed enough for safe movement or whether sedation must happen before transport.

5. Decision Point 1: Treat on Scene or Move Now?

At this moment, immediate full movement is unsafe. The patient is too uncontrolled to be dragged through passageways without risking a secondary fall, worsening head injury, or injury to the team. Some treatment must occur on scene first.

The correct operational decision is a short on-scene stabilization phase focused on control, monitoring, and rapid reversible causes, followed by movement once the patient is safe enough to package.

- What should happen on scene: verbal de-escalation attempt, physical control, oxygen if tolerated, blood glucose as soon as feasible, rapid injury survey, monitor placement if it can be done safely, and preparation for chemical restraint if verbal control fails.
- What should not delay movement unnecessarily: exhaustive exam, lengthy questioning, or repeated attempts to reason with a patient who remains dangerous.
- What would force immediate airway thinking on scene: severe hypoxia, inability to protect airway, repeated vomiting with reduced consciousness, GCS trend toward 8 or lower, or worsening combativeness despite appropriate sedation.

6. Guided Walkthrough: Scene Management

6.1 Establish Control and Leadership

One clinical lead must take control of the scene. The lead clearly states the immediate priorities: safety, quick reversible causes, controlled sedation if needed, then movement to Sick Bay.

- Assign two personnel to limb control and fall prevention.
- Assign one person to prepare oxygen, monitor, and glucometer.
- Assign one person to prepare ketamine and restraints.
- State out loud that the patient may have a head injury and that any sedation must be followed by airway monitoring.

6.2 Verbal De-Escalation Attempt

A brief verbal attempt is appropriate, but it must be short and realistic. Use simple, direct commands. The goal is not psychotherapy. The goal is to reduce movement enough to permit safe assessment.

- Use calm, low-complexity statements: "Stay still. We are helping you. Do not stand up."
- Remove unnecessary noise and extra people from the immediate space if possible.
- Do not crowd the patient with multiple voices.
- If the patient calms enough to cooperate, move directly into focused assessment and controlled movement.

In this scenario, the patient remains highly agitated and attempts to strike at the team.

6.3 Physical Control and Immediate Checks

Because the patient remains dangerous, physical control is required. Use enough force to prevent injury, but avoid positions that impair breathing or worsen agitation.

- Do not pin the patient prone if it can be avoided.
- Do not sandwich the patient in a way that restricts chest excursion.
- Avoid compressing the neck or obstructing the airway.
- Protect the head from repeated impact while controlling limbs.

While the team has partial control, a rapid point check is done:

- Airway: patent but shouting incoherently.
- Breathing: fast and shallow; no obvious cyanosis.
- Circulation: radial pulse present and rapid.
- Obvious disability clue: altered mental status and scalp abrasion.
- Immediate glucose: 2.8 mmol/L (low).

This is the first major reveal. The patient has a clearly treatable contributor: hypoglycemia. However, this does not rule out concurrent head injury or another cause. The case should now be treated as altered mental status with combative behavior, not merely "behavioral agitation."

6.4 Immediate Correction of Reversible Cause

Because hypoglycemia is present, it must be corrected early. The challenge is that the patient is too combative for safe oral intake and too uncontrolled for precise IV access right away.

- If a safe IV can be established immediately, give IV dextrose per local capability and standing protocol.
- If IV access is not immediately achievable and the patient remains dangerous, chemical control may be needed first, followed by IV/IO access and glucose correction.
- If the patient briefly permits, oral glucose is generally not appropriate here because he is altered, combative, and aspiration risk is significant.

In this teaching version, safe IV access is not achievable at scene due to violent movement. The team proceeds to chemical restraint first, then IV/IO access.

6.5 Chemical Restraint

The patient has failed verbal control, remains dangerous, and is preventing essential treatment. Chemical restraint is indicated.

A practical shipboard option is ketamine because it works quickly and usually preserves blood pressure better than many alternatives. It also avoids the delay of trying to negotiate prolonged restraint in a tight compartment.

- Recommended teaching option: ketamine IM for rapid control when IV access is not yet practical.
- If IV/IO access is already in place and can be safely used, IV dosing may be reasonable instead.
- Midazolam is an alternative or adjunct, but it adds more respiratory depression risk and may be slower to solve immediate violent agitation depending on the context.

For this scenario, the lead chooses ketamine IM. The patient is then continuously observed for airway, breathing, and response. Once movement decreases and the patient becomes controllable, the team moves immediately to access and packaging.

7. Decision Point 2: Move to Sick Bay or Continue On-Scene Care?

Once chemical restraint takes effect and the patient can be handled safely, the balance shifts. The best next location is Sick Bay, where better lighting, monitoring, documentation, access, and contingency equipment are available.

The correct decision is to package and move now, because the patient still needs glucose correction, full reassessment, and monitoring for evolving head injury or sedation-related compromise.

8. Movement Considerations

- Before moving, secure the patient with appropriate restraints and enough personnel to prevent a partial awakening from becoming a movement disaster.
- Protect the cervical spine if there is reasonable concern for significant fall mechanism or ongoing altered state with unclear trauma history.
- Use a medsled or Stokes litter depending on the space, angle of movement, and how much body control is needed.
- Bring suction, oxygen, monitor, and airway backup with the patient. Do not send these separately.
- Reassess immediately before movement and again as soon as movement is completed.

9. Sick Bay Arrival and Immediate Management

On arrival to Sick Bay, the patient is more controlled but remains confused. He is no longer violently striking out. The next phase is structured reassessment, reversal of the hypoglycemia, and determination of whether there is a significant concurrent traumatic or medical cause.

9.1 Immediate Sick Bay Actions

- Place on continuous monitoring: SpO2, HR, BP, cardiac rhythm if available.
- Provide supplemental oxygen and reassess work of breathing.
- Establish IV or IO access.
- Administer glucose correction according to local protocol and recheck blood glucose after treatment.
- Perform focused trauma exam with special attention to head, neck, pupils, and evolving neurologic status.
- Determine current GCS and document the trend.
- Check temperature and review for infectious, toxicologic, or metabolic contributors.

9.2 Clinical Evolution

After glucose correction, the patient becomes less physically aggressive but remains confused and intermittently drowsy. His glucose normalizes, yet his mental status does not return to baseline. This is a second major teaching point: a reversible trigger was present, but it was not the whole story.

- Pupils are equal but sluggish.
- He vomits once after arrival.
- He localizes pain, opens eyes to voice, and produces confused speech.
- His current GCS is approximately 11 to 12, with concern that it may drift downward.
- The scalp abrasion and witness history keep head injury high on the list.

10. Decision Point 3: Immediate Evacuation, Hoist, or Short Hold?

At this point, the patient is not stable enough to dismiss, yet not clearly in immediate pre-arrest collapse. The main decision is whether he needs immediate extraction versus short-term onboard observation while arranging transfer.

The best teaching answer is: he requires urgent evacuation planning because of persistent altered mental status after glucose correction plus possible head injury. However, he can remain in Sick Bay briefly while packaging, reassessment, and coordination occur, provided his airway and neurologic status remain manageable.

- If alongside: transfer to the jetty for local ambulance would likely be the most practical rapid pathway.
- If at sea: hoist extraction should be considered early because persistent altered mental status after suspected head injury can deteriorate unpredictably.
- If weather or operational reasons delay extraction: he becomes a monitored hold, but only with explicit neurologic reassessment and airway escalation triggers.

11. What If the Patient Deteriorates?

A key branch in this scenario is downward neurologic drift. If the patient becomes less responsive, repeatedly vomits, loses airway protection, or trends toward GCS 8 or lower, the clinical problem changes from "combative altered patient" to "airway-risk head injury with altered mental status."

- Prepare for definitive airway if he can no longer protect it.
- Treat oxygenation and blood pressure aggressively to avoid secondary brain injury.
- Avoid assuming sedation alone explains the decline. Reassess whether it is medication effect, brain injury progression, or both.
- Document time of last sedative, glucose correction time, and serial neurologic findings.
- Escalate evacuation urgency immediately if neurologic trend worsens.

12. Teaching Notes and Rationale

12.1 Why This Scenario Matters

Combative patients are easy to mislabel as behavioral problems. In naval practice, this can delay treatment of hypoxia, hypoglycemia, traumatic brain injury, sepsis, or intoxication. This scenario teaches that the dangerous behavior is often the entry condition, not the diagnosis.

12.2 Why On-Scene Stabilization Was Needed

The patient was too unsafe to move immediately. Brief on-scene control was required because uncontrolled movement through the ship would likely have worsened both patient and team safety.

12.3 Why Chemical Restraint Was Appropriate

Chemical restraint was not used for convenience. It was used because the patient remained dangerous, blocked essential treatment, and could not be safely transported. In this context, sedation is a medical intervention that enables life-saving care.

12.4 Why Reassessment Is Critical After Sedation

Sedation can improve behavior while hiding deterioration. A quieter patient is not necessarily a better patient. After restraint medication, the team must actively look for hypoventilation, airway loss, progressive TBI, or another ongoing problem.

13. Medication Notes

- Ketamine is often useful in violent agitation because it acts quickly and generally preserves blood pressure better than many alternatives, but it still requires airway monitoring.
- Midazolam may be used in some settings, especially as an adjunct, but it increases respiratory depression risk and may obscure neurologic reassessment.
- Any sedative given to a head-injured or metabolically abnormal patient should trigger a lower threshold for continuous observation.
- Glucose correction is not the end of care. Recheck the glucose and reassess mental status after treatment.

14. Procedure Notes

- If IV access is not feasible because of violent movement, IO access is a valid consideration once enough control is achieved.
- If the patient loses airway control, move promptly into the airway algorithm rather than repeatedly escalating sedation alone.
- If vomiting and declining consciousness occur together, suction readiness and airway positioning become immediate priorities.

15. Shipboard Operational Notes

- Scene control matters as much as medication choice. Too many unassigned personnel in a tight compartment increase risk.
- Movement plans through the ship should be briefed before the patient is lifted.
- Bring the equipment that would be needed for sudden airway deterioration during transport, not after arrival.
- If hoist extraction is contemplated, package planning must account for restraints, airway risk, and the possibility of worsening mental status during transfer.

16. Communication, Teleconsultation, and Handover

- Communicate early that this is a medically unstable altered patient, not just a discipline issue.

- Update command on likely evacuation need and the manpower burden if the patient must be monitored for hours.
- If speaking with outside medical support, give a concise summary: witnessed or possible fall, initial violent agitation, low glucose corrected, persistent altered mental status, possible head injury, current GCS trend, medications given, and current airway status.
- Handover must include exact sedatives used, timing of administration, glucose values, correction given, and the current neurologic trend.

17. What Could Go Wrong Next

- Rebound agitation as ketamine effect wanes.
- Progressive TBI that becomes more obvious only after hypoglycemia is corrected.
- Aspiration after vomiting in a sedated patient.
- Airway compromise from over-sedation or worsening neurologic decline.
- Unsafe movement if the patient re-escalates during transport.
- False reassurance because the patient is quieter but actually worsening.

18. Key Takeaways

- Combative behavior is a presentation, not a diagnosis.
- Scene safety and medical stabilization may both need to happen before movement.
- Look early for reversible causes such as hypoglycemia and hypoxia.
- Chemical restraint is appropriate when the patient is dangerous and preventing essential care.
- A calmer patient after sedation still needs active reassessment.
- If mental status does not normalize after treating a reversible trigger, keep searching for the true or additional cause.
- Persistent altered mental status after suspected head injury should push evacuation planning early.
- Shipboard care requires control, movement planning, equipment readiness, and explicit escalation thresholds.

ACTT Scenario Companion Guide
Scenario 6: STEMI Alongside vs At Sea

Royal Canadian Navy Physician Assistant Focus

Primary focus	STEMI recognition, ECG-driven decision-making, reperfusion choice, transfer planning
Core decision	Immediate jetty transfer vs treat-first vs at-sea fibrinolysis with hoist planning
Major skills touched	ECG interpretation, contraindication screening, tenecteplase prep, anticoagulation, monitoring, handover
End state	Learner should be able to choose the safest reperfusion pathway based on time, location, and transport reality

1. Learning objectives

- Recognize an onboard presentation consistent with acute STEMI.
- Decide whether the patient should move directly to local ambulance transfer, receive onboard fibrinolysis first, or be managed at sea while hoist extraction is arranged.
- Apply the PCI delay threshold and screen for fibrinolysis contraindications.
- Prepare and administer tenecteplase and adjunctive medications when indicated.
- Monitor for reperfusion, bleeding, dysrhythmia, and ongoing instability during movement, transfer, or delayed evacuation.

2. Scenario setup

The ship is running normal operations. A sailor develops central chest pressure radiating to the left arm, with diaphoresis and nausea. Symptoms began 35 minutes ago during duty. A shipmate escorts the casualty toward Sick Bay, but the patient becomes pale, anxious, and short of breath on the way.

This case is taught in two operational branches using the same patient presentation: (1) the ship is alongside and can transfer to the jetty; (2) the ship is at sea and the helicopter can only hoist, not land.

The patient is an adult with no known active bleeding. Medication history is incomplete at first contact.

3. Initial presentation and first contact

On first assessment the casualty is alert but distressed, clutching the chest, speaking in short sentences, and describing ongoing crushing substernal pain. Skin is cool and clammy. Initial priorities are not a full cardiology workup; they are rapid confirmation of stability, rapid ECG acquisition, and early identification of whether this is time-sensitive coronary occlusion.

Immediate actions at the first contact point should include placing the patient at rest, attaching monitoring, checking vital signs, obtaining a focused history, and moving toward the most capable treatment location without delaying the ECG.

4. Immediate scene priorities

Assess ABCs quickly. Ensure the patient can speak, is oxygenating adequately, and is perfusing sufficiently to tolerate movement.

Place on cardiac monitor and obtain a 12-lead ECG as early as possible. If an ECG can be obtained immediately in Sick Bay, do not create harmful delay by stopping in an unsafe passageway to do it there.

Focused history should capture: time of onset, nature of pain, prior cardiac history, known bleeding history, recent stroke, recent head trauma, anticoagulant use, and whether the pain has lasted more than 20 minutes.

5. Decision point: move now or treat in place first

If the casualty is hemodynamically stable enough to move, the default is rapid transfer to Sick Bay because that is where ECG, medications, and continuous reassessment are most sustainable.

If the casualty is unstable during first contact (collapse, malignant dysrhythmia, severe hypotension), immediate resuscitative actions happen where the patient is found before any movement. In a STEMI case, this may mean defibrillation if required, oxygen support, airway readiness, and only then movement.

6. Arrival to Sick Bay and diagnostic confirmation

In Sick Bay, obtain and interpret the ECG without delay. The teaching threshold here is ST elevation greater than 1 mm in two or more contiguous leads, in the correct symptom context, with symptoms ongoing for more than 20 minutes.

Once the ECG supports STEMI, the case shifts immediately from diagnosis to reperfusion planning. The core question is no longer, "Is this cardiac?" It becomes, "What is the fastest realistic path to reperfusion from this exact shipboard situation?"

7. Branch A: Ship alongside

When alongside, the first transport question is whether local ambulance transfer to the jetty can achieve PCI within the effective window. If PCI-capable care can realistically be reached quickly, direct transfer may be the preferred path and fibrinolysis may not be needed onboard.

However, if the real-world delay to PCI is expected to exceed about 90 minutes, then onboard fibrinolysis becomes reasonable if no absolute contraindication exists. The decision must be based on actual transfer reality, not optimistic assumptions.

8. Branch B: Ship at sea

At sea, if helicopter extraction is required and the aircraft must hoist rather than land, time to definitive PCI is often substantially longer and operationally less predictable. In that environment, fibrinolysis may become the most practical reperfusion strategy when the patient meets STEMI criteria and has no major contraindication.

At sea, planning must also consider hoist safety, the possibility of deterioration during packaging, and whether treatment should occur before the evolution to the extraction point.

9. Guided walkthrough: clinical sequence

1) Confirm ongoing ischemic symptoms and obtain ECG evidence of STEMI. 2) Start immediate monitoring and minimize exertion. 3) Determine whether timely PCI is realistically available. 4) Perform a rapid but disciplined contraindication screen for fibrinolysis. 5) If fibrinolysis is indicated, prepare tenecteplase by weight band, then give adjunctive antiplatelet and anticoagulant therapy as appropriate. 6) Reassess continuously for pain response, ECG changes, bleeding, and rhythm complications. 7) Prepare transfer, hoist, or continued holding based on response and operational reality.

10. Contraindication screen before fibrinolysis

Absolute red flags that should stop onboard tenecteplase include active bleeding, suspected aortic dissection, prior intracranial hemorrhage, ischemic stroke within the previous 3 months, severe uncontrolled hypertension, or recent major facial or closed-head trauma.

The practical teaching point is that contraindication screening must be explicit and spoken aloud. This is where communication discipline matters. The team should hear: "We have STEMI criteria, PCI delay is too long, we are now confirming there is no active bleed, no recent stroke, no ICH history, and no suspected dissection."

11. Medication execution

Tenecteplase is given as a weight-based IV push over 5 seconds. The correct dose bands are: under 60 kg = 30 mg; 60 to 69 kg = 35 mg; 70 to 79 kg = 40 mg; 80 to 89 kg = 45 mg; 90 kg or greater = 50 mg. The vial should be reconstituted carefully and not shaken, because shaking causes foaming and dosing error.

Adjunctive medications should be prepared as part of the same reperfusion package. Clopidogrel and anticoagulation (enoxaparin or heparin, depending on the patient and local constraints) should not be treated as optional details. They are part of the treatment pathway and must be charted clearly with exact timing.

12. Monitoring after reperfusion decision

Once therapy is given, the patient is not "done." Continuous reassessment should look for three major things: reperfusion, bleeding, and dysrhythmia. Reperfusion may show up as improving pain or ECG changes. Harm may show up as hypotension, new bleeding, neurologic decline, or reperfusion arrhythmias.

If no fibrinolysis is given because rapid PCI is feasible, the same monitoring still matters during transfer. A patient with confirmed STEMI can deteriorate during movement or while awaiting pickup.

13. Movement and evacuation planning

Alongside branch: package for jetty transfer only after the immediate treatment plan is set. Ensure IV access is secure, monitor leads are maintained if possible, and the receiving team gets a concise handover that includes symptom onset time, ECG findings, drugs already given, and whether fibrinolysis has been administered.

At-sea branch: if hoist is required, the team must decide whether the patient is safer being treated first in Sick Bay or moved immediately to the extraction point. In most cases, the patient should be stabilized enough to tolerate movement before hoist. All lines must be secured, monitoring simplified to what can be maintained, and the team should anticipate pain recurrence, dysrhythmia, or hypotension during the evolution.

14. If evacuation is delayed

If weather, aircraft timing, or local coordination delays transfer, the case temporarily becomes a prolonged holding problem. This means continued cardiac monitoring, serial vital signs, repeat pain assessment, careful observation for bleeding, and readiness to manage dysrhythmia or shock.

If the patient becomes hypotensive, develops pulmonary edema, has recurrent severe pain, or shows signs of bleeding or neurologic change, the team must re-declare deterioration and escalate immediately. "Stable STEMI" is often only temporarily stable.

15. Teaching notes and side notes

This scenario is meant to teach that reperfusion decisions are operational decisions, not just textbook cardiology decisions. The same ECG may lead to a different immediate plan depending on whether the ship is alongside, how long real transfer will take, and whether extraction at sea is simple or operationally complex.

The most common failure in this case is losing time to indecision. Teams sometimes perform serial reassessments without committing to the reperfusion pathway. In STEMI care, that delay is itself harmful.

Another common failure is treating the transfer plan and the drug plan as separate. In reality, the transfer plan should be built around the treatment decision, and the treatment decision must account for how long transfer will actually take.

16. Common pitfalls in this scenario

- Delaying ECG confirmation while collecting low-yield details.
- Assuming PCI is "available" without calculating realistic delay from ship to definitive care.
- Giving fibrinolysis without a structured contraindication screen.
- Choosing the wrong tenecteplase weight band or reconstituting it poorly.
- Failing to document exact symptom-onset time and exact medication times.
- Forgetting that post-fibrinolysis bleeding and dysrhythmia surveillance is part of the treatment, not an optional extra.

17. Communication and handover points

The clinical lead should explicitly state: confirmed STEMI, symptom onset time, current hemodynamic status, chosen reperfusion strategy, drugs administered, and what the next risk is. For ambulance or hoist handover, the receiving team needs a short sequence: when pain started, what the ECG showed, whether tenecteplase was given, when antiplatelet and anticoagulant drugs were given, and what the patient is doing now.

If teleconsultation is used, the ask should be precise: confirmation of fibrinolysis plan, support for contraindication assessment, or support for managing complications while awaiting evacuation.

18. Key takeaways

- In a shipboard STEMI, the critical skill is matching the reperfusion plan to real transport time, not ideal assumptions.
- Timely ECG confirmation, explicit contraindication screening, accurate tenecteplase dosing, and structured monitoring are the core execution steps.
- Alongside and at-sea cases may share the same diagnosis but require different immediate actions because the route to reperfusion is different.

- If transfer is delayed, the case immediately becomes a monitoring, complication-detection, and re-escalation problem.

19. Quick medication reference for this scenario

Drug	Typical role here	Key dose cue	Administration note	Main warning
Tenecteplase	Fibrinolysis if PCI delay >90 min and no contraindication	30-50 mg by weight band	IV push over 5 seconds after careful reconstitution	Bleeding, neurologic decline, wrong weight band
Clopidogrel	Adjunct antiplatelet	300 mg PO STAT in typical fibrinolysis pathway	Give promptly and chart time	Bleeding risk; do not forget timing
Enoxaparin	Adjunct anticoagulation	30 mg IV bolus then 1 mg/kg SQ q12h in common protocol	Adjust for age/renal factors	Bleeding; not ideal in severe renal impairment
Heparin	Alternative anticoagulation	60 units/kg bolus then 12 units/kg/hr infusion	Requires disciplined infusion setup	Infusion/dose error and bleeding

Teaching intent: This is a guided learning scenario. It is structured to teach decision-making, timing, operational adaptation, and safe transfer planning in an RCN shipboard context. Use the detailed ACTT manual chapters for the full background reference behind each step.

ACTT Scenario 7

Hypothermic Casualty Recovered From Cold Water

Scenario-based teaching guide for Royal Canadian Navy Physician Assistant training

1. Learning objectives

- Recognize and stage accidental hypothermia after cold-water recovery.
- Prioritize on-scene actions that prevent further heat loss while preserving airway, breathing, and circulation.
- Decide what treatment must occur at the recovery point versus what can safely wait until movement to Sick Bay.
- Apply modified arrest logic and rewarming priorities for severe hypothermia.
- Choose between hoist extraction, jetty transfer, or shipboard holding based on physiology, location, and available support.
- Anticipate deterioration during transport, rewarming, and prolonged holding.

2. Initial setting

Operational context: The ship is at sea in cold weather. A sailor has been recovered after an unplanned cold-water exposure during upper-deck operations. The helicopter cannot land on the deck, so any aviation evacuation requires hoist. Sea state is moderate, wind chill is significant, and the recovered casualty is wet, cold, and at risk of rapid deterioration.

- Location of first contact: recovery point on deck near the rescue area.
- Available immediate personnel: PA, med tech / medical assistant if available, deck crew assisting with recovery, stretcher support personnel.
- Available immediate equipment: blankets, heat-conserving wraps, oxygen, monitor, suction, bag-valve-mask, IV / IO supplies, warmed fluids if preparation time allows, Stokes litter, medsled.

3. Initial presentation

Primary version of the scenario: The casualty is conscious but confused and slowed after cold-water recovery. He is shivering initially, speech is slurred, and he is not reliably following complex commands. He is pale, soaked, and intermittently combative when handled. Respirations are spontaneous. Pulse is present but slow. He complains of exhaustion, chest tightness, and severe cold.

- Skin: cold, pale, wet.
- Mental status: confused, slowed, not fully reliable.
- Respirations: spontaneous, shallow but present.
- Pulse: present, bradycardic.
- Temperature: core temperature not yet confirmed at the recovery point.
- Mechanism considerations: prolonged immersion, possible aspiration, possible secondary trauma during recovery.

4. Immediate scene priorities

- Confirm the casualty has actually been recovered safely and is no longer exposed to ongoing water or spray.
- Minimize handling. Rough movement can worsen instability and may precipitate ventricular arrhythmias in significant hypothermia.
- Perform a focused ABC assessment at the recovery point.
- Prevent further heat loss immediately by removing the patient from wind, using insulating wraps, and replacing wet exposure with dry insulating layers as feasible.
- Apply oxygen if indicated and if this can be done without delaying more important heat-conservation steps.
- Decide early whether the casualty is stable enough for immediate movement or whether a short period of stabilization on scene is required first.

5. Decision point: treat on scene or move immediately

Teaching principle: The answer depends on whether movement improves safety or creates avoidable risk. In hypothermia, the wrong instinct is to rush movement without controlling heat loss or assessing airway and perfusion first.

If present	Do on scene first	Reason
No airway / no effective breathing	Immediate airway intervention and assisted ventilation before movement	Movement without oxygenation risks arrest.
Unstable but spontaneous breathing	Rapid insulation, oxygen, monitor, brief focused assessment, then move	Heat loss continues unless protected; do not delay for nonessential steps.
Pulseless / absent vital signs in severe hypothermia	Begin hypothermia-specific arrest management where found, then move only if it improves resuscitative capability	Severe hypothermia changes standard arrest logic.

6. Guided walk-through: expected management sequence

6.1 Step 1: controlled first contact

- Approach with enough personnel to control the environment and support a low-movement transfer.
- Confirm responsiveness, breathing, and presence of a pulse.
- Do not assume bradycardia equals arrest. In profound hypothermia, pulse checks may need to be deliberate and prolonged.
- If spontaneous breathing and pulse are present, the immediate priority is protection from further cooling plus ongoing ABC support.

Side note: Cold, altered patients can look near-arrested. Slow does not equal dead. Avoid premature termination logic.

6.2 Step 2: immediate heat conservation

- Remove from wind and spray exposure.

- Strip wet outer layers only if doing so is practical and does not create more exposure time than benefit.
- Dry and insulate as quickly as possible with blankets, wraps, or an improvised warming package.
- Prioritize torso insulation. Keep the patient horizontal if possible.
- Do not apply aggressive direct external heat to the head in severe hypothermia, especially if the patient deteriorates into arrest.

Teaching reason: The first thermal win is preventing additional heat loss. Rewarming starts by stopping further cooling, not by chasing complex warming interventions before the basics are done.

6.3 Step 3: airway and breathing assessment

- Assess whether the casualty can maintain airway patency and whether protective reflexes are still present.
- Apply oxygen if available and indicated, especially if there is concern for aspiration or respiratory compromise.
- If breathing is inadequate, support with bag-valve-mask ventilation and prepare for escalation if mental status declines.
- If the casualty is conscious but confused, continue repeated reassessment; do not intubate reflexively unless airway control is becoming unreliable.
- If the patient loses airway reflexes, becomes progressively obtunded, or shows failing ventilation, shift to the airway pathway from the main manual.

6.4 Step 4: determine likely hypothermia stage

- HT I: mild hypothermia, usually shivering and more awake.
- HT II: moderate hypothermia, impaired consciousness, reduced shivering, slowed function.
- HT III: severe hypothermia, unconscious or near-unconscious but still with vital signs.
- HT IV: absent vital signs / cardiac arrest.

In this primary version, the casualty most likely fits HT II initially: altered mental status, cold exposure, preserved but impaired spontaneous function.

6.5 Step 5: decide how to move the casualty

- Use a movement method that protects the casualty from further exposure and minimizes jostling.
- A Stokes litter is appropriate if a controlled deck-to-Sick Bay movement is required and the environment is tight or unstable.
- A medsled may be useful where dragging / constrained movement is safer than repeated lifting through awkward passageways.
- Assign one person to watch airway / consciousness, one to watch lines and monitoring, and one to coordinate route and movement.

Operational tip: In hypothermia, the move itself is a physiologic event. Secure, brief, deliberate movement is safer than rushed improvised movement.

6.6 Step 6: arrival in Sick Bay and immediate reassessment

- Repeat primary survey immediately on arrival.
- Obtain core temperature if available.
- Reassess mental status, pulse, blood pressure, respiratory pattern, oxygen requirement, and any aspiration concerns.
- Begin more controlled active rewarming if indicated and available.
- Establish IV access if practical; if access is difficult and clinically necessary, consider IO if the patient is deteriorating or resuscitative access is urgently needed.

6.7 Step 7: initiate rewarming appropriate to stage

- For mild to moderate hypothermia with preserved circulation, continue external insulation and active external warming as available.
- Use warmed IV fluids, approximately 38-42 C, if IV fluids are indicated and can be given safely.
- If severe hypothermia is present, continue gentle handling and escalate monitoring. More invasive rewarming adjuncts may be needed depending on capability and consultant guidance.

Teaching caution: Do not over-treat a stable, perfusing casualty with unnecessary aggressive interventions simply because the temperature is low. Match treatment intensity to physiology, not anxiety.

6.8 Step 8: branch point - deterioration into severe hypothermia or arrest

Scenario branch: While being rewarmed, the casualty becomes less responsive. Pulse becomes extremely difficult to detect and respirations become agonal.

- Reassess carefully for pulse and organized breathing.
- If absent vital signs are confirmed and severe hypothermia is the leading cause, shift to HT IV / hypothermic arrest logic.
- Begin CPR if indicated.
- Remember severe hypothermia can justify prolonged resuscitative effort, especially if advanced rewarming or meaningful evacuation options remain possible.
- Limit epinephrine and defibrillation to up to three doses / attempts before meaningful rewarming, per the source-derived framework used in this guide.

7. Evacuation decision: jetty, hoist, or hold

This scenario is most useful because it forces an evacuation decision based on physiology and geography.

Option	Best fit	Advantages	Limitations
Jetty ambulance (if alongside)	Perfusing casualty who needs hospital evaluation but can tolerate short transfer	Fast handoff to local EMS; avoids prolonged onboard burden	Only possible if alongside or able to offload safely
Helicopter hoist (at sea)	Unstable or high-risk casualty needing faster higher-level care when sea conditions permit	Shortens time to advanced rewarming / ICU support	Hoist prep is manpower-intensive; movement and packaging create added risk
Hold up to 72 hours	Relative physiologic stability with manageable rewarming and monitoring burden	Avoids dangerous transfer if extraction conditions are poor	Requires disciplined reassessment; deterioration can be gradual

8. Medication and supportive care notes

- There is no single hypothermia drug that fixes the problem; care is primarily supportive, thermal, airway, and circulatory.

- Warm IV fluids are useful if fluid administration is indicated, but fluid choice and volume still depend on the clinical picture.
- If pain, agitation, or shivering control becomes a concern, any sedating medication must be used cautiously because hypothermic patients can deteriorate quickly and may need airway support.
- Do not create avoidable respiratory depression in a fragile patient simply to make management easier.

9. Procedure notes

- Airway interventions are indicated by actual airway failure, not by cold exposure alone.
- If the patient deteriorates to severe altered mental status with airway risk, move into the airway algorithm and procedural pathway deliberately.
- IV access may be difficult in cold vasoconstricted patients; plan early if access is likely to matter.
- If cardiac arrest occurs, resuscitation and movement must be organized around hypothermic arrest principles, not routine warm-arrest assumptions.

10. Shipboard operational notes

- The rescue point may be medically inferior but operationally unavoidable for initial care. Do only what improves immediate safety there.
- Movement to Sick Bay is usually desirable once the casualty is insulated and ABCs are reasonably controlled.
- Use the route and packaging method that best protects airway, warmth, and device security.
- If hoist evacuation is being considered, packaging and timing should be coordinated early so the clinical team does not lose time after the decision is made.

11. Communication, handover, and teleconsultation

- Notify command early if the casualty may require urgent extraction, prolonged hold, or intensive monitoring.
- If consulting remotely, communicate: exposure history, recovery timeline, core temperature if known, current mental status, pulse / respiratory status, rewarming measures, and whether the patient is improving or drifting.
- If handing over to evacuation personnel, include what happened at the recovery point, what was done before movement, rewarming methods, vital-sign trend, and whether the casualty ever lost detectable vital signs.

12. What could go wrong next

- Progressive decline in mental status leading to airway loss.
- Ventricular dysrhythmia triggered by rough movement or worsening physiology.
- Delayed recognition that the casualty has transitioned from moderate to severe hypothermia.
- False reassurance after initial warming response while the patient still drifts hemodynamically.
- Underestimating the monitoring burden if prolonged holding becomes necessary.

13. Key teaching takeaways

- In cold-water recovery, stop further heat loss first while preserving ABC priorities.
- Handle the casualty gently and move deliberately; the transfer itself can worsen the patient.
- Stage hypothermia clinically and let the stage drive the intensity of care.

- Severe hypothermia changes arrest logic; do not apply routine warm-patient assumptions blindly.
- Evacuation choice must balance physiology, weather, distance, and the ship’s ability to sustain safe care.
- A patient who survives initial recovery can still deteriorate later; repeated reassessment is the real safety net.

ACTT Scenario Companion Guide

Scenario 8: Polytrauma With Delayed Evacuation and 24-72 Hour Hold

Royal Canadian Navy Physician Assistant Focus

1. Learning Objectives

- Apply an integrated scene-to-Sick Bay approach to a multi-system trauma patient.
- Prioritize life threats while avoiding fixation on a single injury.
- Decide what must be done immediately at the scene versus what can wait until movement to Sick Bay.
- Convert a resuscitated but still unstable casualty into an organized 24-72 hour holding plan when evacuation is delayed.
- Use structured reassessment, device maintenance, medication continuity, and clear handover in prolonged shipboard care.

2. Initial Setting

The ship is at sea in moderate weather, well outside a rapid shore transfer window. Flight conditions are poor and rotary-wing support is unavailable for several hours. The casualty is injured during a shipboard industrial accident involving a heavy unsecured load, a fall, and secondary blunt trauma. Immediate treatment begins at the scene. The casualty may ultimately require hoist extraction when conditions improve, but the working assumption at the start is that the patient may need to be held onboard for up to 72 hours.

- Environment: moving platform, narrow passageways, ladder wells, noise, intermittent space constraints.
- Likely transport tools: Stokes litter, medsled, carry team, route planning through compartments.
- Clinical reality: no definitive trauma bay, limited staffing, finite monitoring continuity, delayed evacuation.

3. Initial Presentation

A 34-year-old sailor is struck by shifting equipment in a machinery-related workspace. Witnesses report that the casualty was thrown against a bulkhead, briefly pinned, then collapsed to deck. The patient is found supine, pale, tachypneic, and confused. There is visible bleeding from a scalp laceration, bruising over the left lateral chest, and obvious pain with movement of the right thigh. One witness reports the patient 'was talking fine for a minute, then got quieter.'

- Approximate initial findings at scene: GCS 12 (E3 V4 M5), HR 128, RR 28, SpO2 92% on room air, BP 98/64, cool extremities.
- Obvious concerns: head injury, chest injury, long-bone injury, occult bleeding, developing shock, possible respiratory compromise.
- Initial tactical question: what must be done where found, and what can wait until the casualty is moved safely?

4. Immediate Scene Priorities

1. Take control of the scene and assign roles immediately.
2. Perform a primary survey focused on airway, breathing, circulation, disability, and exposure.
3. Control any active external bleeding and rapidly identify hidden life threats.
4. Provide oxygen and initiate monitoring as soon as practical.
5. Decide whether the patient can be moved now or needs a life-saving intervention before movement.

4.1 What Must Be Addressed Before Movement

- Airway patency and ability to protect the airway.
- Work of breathing and whether there are signs of evolving tension physiology.
- Immediate hemorrhage control.
- Whether decreased consciousness is worsening.
- Whether movement itself is likely to worsen the patient if done before stabilization.

4.2 Guided Walkthrough at the Scene

The patient is speaking but confused, so the airway is currently patent. However, the combination of head injury, declining interaction, and borderline oxygenation means the airway cannot be assumed safe for long. Apply oxygen immediately, ideally by non-rebreather if tolerated, and place the patient on portable monitoring if available.

Breathing must be assessed aggressively. The lateral chest bruising, tachypnea, and reduced oxygen saturation may represent pain, pulmonary contusion, developing pneumothorax, or early hemothorax. Auscultation and chest rise should be compared side to side. If marked unilateral reduction in breath sounds is present with worsening hemodynamics, the team should be prepared to decompress before movement.

Circulation should be addressed in parallel. External bleeding from the scalp should be controlled with direct pressure and dressing, but the scalp wound is unlikely to be the main cause of shock. The right thigh injury raises concern for major femoral bleeding into the limb. Palpate pulses, assess deformity, and consider temporary splinting or traction-type stabilization if it can be done quickly and safely.

Disability is central here. The GCS of 12 is not yet an automatic airway trigger, but the trend matters more than the isolated number. Repeat the neurologic check within minutes. If the patient drifts downward, your threshold for early airway planning drops significantly.

5. First Decision Point: Treat on Scene or Move Now?

This is a classic shipboard decision: every minute spent at the scene may improve stabilization, but every extra minute in a cramped workspace also delays better lighting, equipment, suction, and broader support in Sick Bay.

5.1 Best Teaching Answer

- Do on-scene actions that immediately change survival: oxygen, hemorrhage control, fast primary survey, brief neuro check, chest reassessment, rapid splinting if it meaningfully reduces pain/bleeding, and IV/IO access if it can be obtained without delaying movement excessively.
- Do not stay on scene to perform lower-yield tasks that can be done better in Sick Bay.
- Move once the patient is safe enough to survive the transfer, unless an immediately fatal problem such as tension pneumothorax requires intervention before movement.

5.2 Side Note

The wrong extreme is either to rush movement before life threats are addressed, or to build a full treatment bay at the scene while the patient deteriorates in a poor environment. On a ship, the best answer is usually a short, decisive stabilization phase followed by deliberate movement.

6. Movement to Sick Bay

The casualty is packaged for movement using a litter solution appropriate to the route. Because the patient has likely multi-system trauma, movement must be treated as a clinical event, not a transport chore.

- Secure the head and torso as indicated by mechanism and current condition.
- Secure oxygen delivery, monitoring leads if portable, dressings, and any temporary splints.
- Assign one person to airway observation during movement.
- Assign one person to monitor clinical deterioration during transfer.
- Pre-brief: if the patient loses airway, vomits, desaturates, or becomes profoundly hypotensive, the team must stop and address the problem immediately.

6.1 Likely Deterioration During Movement

En route, the patient becomes more drowsy. Reassessment shows GCS now 9 (E2 V2 M5), SpO2 90% despite oxygen, HR 136, BP 92/58. The casualty is not yet in arrest, but the trend is clearly worsening.

6.2 Teaching Point

This is the moment where many teams lose time by continuing transport without updating the plan. A dropping GCS plus worsening oxygenation means you should arrive in Sick Bay already thinking: definitive airway may soon be required, chest injury may be contributing, and shock remains unresolved.

7. Arrival to Sick Bay: Secondary Assessment and Structured Management

Once in Sick Bay, the team must shift quickly from transport mode to organized resuscitation. The patient now has better access to suction, medications, procedure equipment, and documentation.

7.1 Immediate Reassessment in Sick Bay

6. Repeat primary survey in full.
7. Re-document mental status and pupils.
8. Reassess chest findings and work of breathing.
9. Establish durable access: at least one large IV if possible; IO if IV access is delayed.
10. Begin a focused secondary survey for hidden bleeding and associated injuries.

7.2 Expected Working Problem List

- Traumatic brain injury with falling GCS.
- Blunt chest trauma with risk of pneumothorax, hemothorax, or pulmonary contusion.
- Likely long-bone fracture with hemorrhage contribution.
- Shock, likely mixed traumatic blood loss plus pain/stress response, with neuroprotection concerns.
- High risk of deterioration during delayed evacuation.

8. Immediate Management in Sick Bay

8.1 Airway and Breathing

With GCS now 9 and trending downward, airway control must be actively prepared. The patient may still be breathing spontaneously, but the trajectory suggests that the team should not wait for complete loss of airway reflexes. Pre-oxygenate, prepare RSI equipment, and state the failed-airway backup plan out loud.

If unilateral absent breath sounds, rising distress, worsening hypotension, or tension physiology are identified, decompress first. If the chest problem appears to be the immediate driver of instability, a needle thoracostomy may be needed before or during airway control.

8.2 Circulation

The patient is hypotensive enough to threaten cerebral perfusion. In a trauma patient with suspected TBI, the goal is not permissive hypotension. Support systolic blood pressure above 110 mmHg if possible while simultaneously looking for bleeding sources. Use isotonic resuscitation and blood products if available; avoid hypotonic strategies.

The thigh injury should be stabilized, and the team should consider ongoing blood loss into the limb. External compression or splinting may reduce further loss and improve pain.

8.3 Disability

Repeat GCS, pupils, and gross motor response. Watch for asymmetry, new vomiting, or declining responsiveness. Document every change. In a patient who may be held for hours, the trend is more valuable than a single number.

8.4 Exposure and Temperature

Fully expose enough to find injuries, then prevent hypothermia. Trauma patients drift colder quickly at sea, and that worsens coagulopathy, perfusion, and later management.

9. Second Decision Point: Immediate Evacuation, Delayed Extraction, or Hold?

The patient needs higher trauma capability. The question is not whether evacuation is ideal; it is whether evacuation is immediately possible and whether the patient can survive the delay.

9.1 If a Hoist Is Imminently Available

- Stabilize only what is necessary to survive packaging and transfer.
- Secure airway if loss is likely before or during extraction.
- Decompress chest before transfer if indicated.
- Control bleeding, stabilize long-bone injury as feasible, and communicate the exact current trend to the receiving team.

9.2 In This Teaching Version

Weather prevents immediate extraction. The best teaching decision is to assume a prolonged hold and convert from acute resuscitation into a formal 24-72 hour holding plan while continuing to reassess whether evacuation becomes feasible.

10. Converting to a 24-72 Hour Holding Plan

Once delayed evacuation is clear, the team must stop improvising and deliberately enter prolonged-care mode.

10.1 Immediate Hold Conversion Checklist

- Define the active problem list and prioritize what can kill the patient first.
- Set explicit targets: oxygenation, ventilation, blood pressure, mental status trend, urine output if catheterized.
- Decide what requires continuous monitoring versus scheduled reassessment.
- Establish medication timing, device checks, and documentation rhythm.
- Define deterioration triggers that would prompt renewed evacuation requests or urgent teleconsultation.

10.2 Airway Strategy During the Hold

If the patient is intubated, tube security, post-intubation sedation, suction access, ventilation targets, and ongoing confirmation become major burdens. If the patient is not yet intubated, repeated reassessment is mandatory. A patient with a falling GCS can become an airway emergency hours into the hold if the team is complacent.

- Track SpO2 and work of breathing continuously when possible.
- Use EtCO2 if ventilating or if capnography is available.
- For suspected TBI, avoid hypoxia and keep ventilation controlled; reserve hyperventilation for brief rescue use only if herniation is suspected.

10.3 Perfusion Strategy During the Hold

Trend blood pressure, heart rate, mental status, skin signs, and urine output. Do not keep giving blind boluses. Every fluid decision must be linked to response. If the patient remains hypotensive after reasonable resuscitation, ask whether the problem is ongoing bleeding, occult thoracic compromise, neurogenic issues, or a need for more advanced support than the ship can safely provide.

- Reassess after each bolus.
- Avoid worsening oxygenation with uncontrolled fluid loading.
- If pressor support becomes necessary, monitoring and staffing burden rise sharply.

10.4 Neurologic Strategy During the Hold

Serial neuro checks should include GCS trend, pupils, and gross movement if possible. If the patient worsens, think first about hypoxia, hypotension, expanding intracranial injury, seizure, or missed chest/circulatory deterioration. Do not assume sedation or fatigue explains every mental-status change.

- Document time and direction of each neurologic change.
- If impending herniation signs appear, apply brief rescue measures while escalating urgently for outside support.

10.5 Device and Nursing-Style Maintenance

- If chest tube placed: monitor output, bubbling, kinks, and re-tension signs.
- If Foley placed: track urine output and keep the system unobstructed.
- If IO used: check for pain, extravasation, and whether more durable access is now possible.
- Reposition, prevent pressure injury, maintain temperature, and manage secretions and comfort.

11. Medication Plan for This Scenario

This scenario intentionally forces the learner to think beyond the first drug given. In a prolonged hold, medication continuity matters as much as initial medication choice.

11.1 Likely Medication Needs

- Analgesia for the long-bone injury and overall trauma burden.
- Sedation if intubated or if severe agitation emerges.
- RSI medications if airway control is performed.
- ICP-directed therapy only if clinical deterioration justifies it and the hemodynamic context permits.
- Antiemetic support and supportive medications as needed.

11.2 Teaching Notes

Do not let pain control be neglected just because the case is high acuity. Untreated pain worsens agitation, oxygen demand, and handling difficulty. However, every sedative or opioid choice must be linked to airway monitoring and repeated reassessment, especially when the neurologic exam matters.

12. Team, Communication, and Handover

Polytrauma cases fail quickly when the team has no shared mental model. One person must hold the plan and keep stating it.

- State the working problem list out loud.
- Assign who is responsible for airway watch, medication timing, trend documentation, and device checks.
- Use closed-loop communication for all critical medications and procedures.
- Document what was done, when it was done, and what changed afterward.
- When calling for teleconsultation or renewed evacuation support, present a concise timeline, current status, and what may fail next.

13. What Could Go Wrong Next

- Progressive loss of airway as GCS falls further.
- Unrecognized worsening pneumothorax or hemothorax after partial initial improvement.
- Shock worsens because a temporary improvement in blood pressure creates false reassurance.
- Delayed neurologic decline, including worsening pupils or seizure activity.
- Pain and agitation become harder to control over time, increasing monitoring burden.
- Device failure: line infiltration, chest tube dysfunction, dislodgement during movement, Foley obstruction.
- Documentation and handover failures during a long hold.

14. Key Teaching Pearls

11. In shipboard polytrauma, the first win is not a perfect diagnosis - it is recognition of the problems that can kill the patient first.
12. Do only the on-scene interventions that change survival, then move deliberately to the place where you can do more safely.
13. A falling GCS in trauma is a trend problem; do not wait for complete collapse before preparing for airway control.
14. If evacuation is delayed, do not keep operating in pure resuscitation mode. Convert early to an explicit holding plan.
15. Every tube, line, drain, and drug creates an ongoing maintenance burden. Plan for that burden immediately.

16. Trend data, structured reassessment, and disciplined handover are what keep a 'rescued' patient from quietly deteriorating hours later.

15. Suggested Self-Test Questions

- What actions must happen before moving this casualty from the scene?
- What findings would make chest decompression necessary before movement?
- At what point does airway planning become airway action in this case?
- How does suspected TBI change your blood pressure target?
- What turns this from a resuscitation case into a prolonged-holding case?
- What must be reassessed every 15-30 minutes in the first hours of the hold?
- What information must be ready for teleconsultation or evacuation handover?

ACTT Scenario Companion Guide
Scenario 9: Failed Airway / Cannot Intubate, Cannot Oxygenate

Royal Canadian Navy Physician Assistant Focus
Guided teaching case for shipboard rescue airway decision-making

1. Learning objectives

- Recognize a failed airway early and stop repeated low-yield attempts.
- Distinguish when oral intubation remains reasonable versus when immediate surgical airway is required.
- Run a can't intubate, can't oxygenate sequence in a shipboard environment with limited space and movement.
- Package the casualty for ongoing airway management, movement, and evacuation after a rescue airway is placed.
- Use closed-loop communication and explicit failure triggers during a rapidly deteriorating airway event.

2. Initial setting

Operational context: At sea, night operations, moderate sea state. The ship has a red deck, so rotary-wing extraction is by hoist only. The casualty is located in a narrow upper-deck access passage near damage-control equipment staging.

Available personnel: You (RCN PA), one medic, two non-clinical crew assisting with scene control and movement, and remote physician consultation available by radio/satcom if time permits.

Available equipment: Airway bag, suction, oxygen, BVM, direct/video laryngoscopy kit, ET tubes, bougie, RSI medications, surgical cric kit, Stokes litter, medsled, monitor, IO supplies.

3. Scenario entry

A 32-year-old sailor is struck in the face and neck by a recoiling line under tension during deck work. Crew report immediate collapse to knees, copious oral bleeding, obvious facial trauma, and rapidly worsening noisy respirations. By the time you arrive, he is sitting against a bulkhead, agitated, blood pooling in the oropharynx, with severe facial distortion, stridor, and progressive cyanosis.

- Initial visible concerns: severe maxillofacial trauma, blood in airway, swelling, agitation, ineffective gas exchange.
- Likely immediate threats: upper airway obstruction, aspiration, hypoxia, loss of airway during movement, hemorrhage, C-spine concern depending on mechanism.
- Initial vitals if obtainable: HR 132, RR 34 and labored, SpO2 84% on room air, BP 148/92, GCS 11 (E3 V3 M5) but deteriorating.

4. Immediate scene priorities

- Take command and declare the main problem out loud: "This is a rapidly failing airway with facial trauma."

- Assign immediate roles: airway lead, suction/BVM support, monitor/med prep, scene control and lighting.
- Position for best airway access while maintaining manual stabilization if cervical concern exists.
- Apply oxygen immediately; suction aggressively and repeatedly.
- Do a fast decision check: can the patient oxygenate, can the patient ventilate, can standard oral intubation realistically work?

5. First major decision point: treat on scene or move now?

This casualty should not be moved first if the airway is clearly failing and likely to worsen in transit. The core teaching point is that a narrow, unstable passageway is inconvenient, but moving a patient with a rapidly collapsing upper airway before securing or rescuing the airway may convert a difficult airway into an unrecoverable one.

- Treat on scene first if the airway is actively failing and immediate intervention will change survival.
- Move first only if the current location is truly impossible for intervention and the airway can be maintained during transfer.
- In this case, the correct bias is brief on-scene stabilization and immediate airway decision-making before transport.

6. Staged progression

Stage 1: Initial airway attempt analysis

Despite suction and oxygen, the patient becomes more obtunded. SpO2 falls to 79%. Jaw thrust improves flow only minimally. Facial trauma is severe, landmarks are distorted, and the oropharynx is obscured by blood. The patient is now barely following commands.

- Teaching cue: severe facial trauma plus heavy bleeding may make standard oral intubation unrealistic.
- Teaching cue: if oral intubation is not likely to succeed, do not waste the airway with repeated attempts.
- Teaching cue: in a difficult airway, one controlled attempt is the maximum if you believe a view is still possible and oxygenation can be supported.

Stage 2: Controlled attempt and declared failure trigger

You decide on one rapid, controlled attempt only because the video laryngoscope is immediately available and the patient is still minimally oxygenatable with BVM plus suction. Before the attempt, you state the failure trigger out loud: "One attempt only. If no usable view or no tube passage, we move directly to surgical cric."

- Suction is prepared first, not as an afterthought.
- Backup surgical airway kit is opened before the attempt begins.
- Medication choice must account for hemodynamics and the fact that failed oral intubation is expected.

Stage 3: Failed attempt

Video laryngoscopy yields only blood and distorted tissue. There is no reliable glottic view. Oxygen saturation drops further. BVM is increasingly ineffective because of facial instability and obstruction. This is now a can't intubate, can't oxygenate event.

- Do not make a second speculative attempt.
- Do not keep "trying to get a better look" while saturation falls.
- Do not delay for perfect sterility or ideal setup. The rescue airway is now the life-saving step.

Stage 4: Surgical cricothyroidotomy

You transition immediately to surgical cricothyroidotomy. One assistant stabilizes the larynx as best as anatomy allows. Another maintains suction and passes equipment. You perform a midline vertical skin incision to find the membrane despite blood and swelling, then enter the cricothyroid membrane and place the tube using the prepared rescue kit.

- Confirmation must include EtCO2 if available, chest rise, bilateral breath sounds if assessable, and rapid oxygenation response.
- Securement matters immediately because deck movement and later transfer create high dislodgement risk.
- Once the airway is in, the scenario moves from rescue to maintenance and evacuation planning.

7. Guided walkthrough and expected management sequence

1. Recognize the airway as the primary life threat and say it explicitly to the team.

2. Apply oxygen and suction immediately; position the casualty for the best achievable airway access.

3. Assign roles before any attempt: operator, suction/BVM assistant, meds/monitor, equipment support.

4. Assess whether oral intubation is realistically possible. Massive facial trauma and blood may make it a poor primary plan.

5. If one controlled intubation attempt is chosen, state the attempt limit and the exact failure trigger before starting.

6. Open the surgical cric kit before the first airway attempt so there is no delay if the attempt fails.

7. After failed view and poor oxygenation, stop. Declare can't intubate, can't oxygenate. Move immediately to cricothyroidotomy.

8. Place the surgical airway using a disciplined sequence: identify midline, vertical incision, membrane entry, tube placement, then immediate confirmation.

9. Start controlled ventilation, secure the tube, and begin post-airway sedation/analgesia as clinically appropriate.

10. Reassess oxygenation, EtCO2, hemodynamics, bleeding, and whether additional facial/neck injury management is required.

11. Only after the airway is secure should the team package the patient for movement to Sick Bay or transfer staging.

12. Make the evacuation decision early: this casualty almost certainly requires urgent off-ship higher-level care once stabilized enough for movement.

8. Medication and airway execution notes

This scenario is primarily about airway decision-making, but medication choices still matter.

- If RSI is attempted, induction should be paired with an appropriate paralytic. Ketamine alone is not a true RSI plan.
- If the patient is already crashing into can't intubate, can't oxygenate, do not let medication administration delay the surgical airway.

- After rescue airway placement, ongoing sedation becomes necessary to prevent agitation, tube dislodgement, and awareness during ventilation.
- Continuous monitoring after any sedative is mandatory because the airway may be technically placed but still vulnerable to obstruction, displacement, or inadequate ventilation.

9. Movement, packaging, and evacuation decision

Once the rescue airway is confirmed, the next question is not whether the casualty is "fixed." The question is whether the airway can be maintained safely during movement and whether the ship can sustain this level of care.

- Secure the surgical airway with ties suitable for movement, not just temporary hand control.
- Package the patient with suction and BVM/ventilation plan immediately available during transport.
- Use a Stokes or medsled depending on route and access, but only after all tubes/lines are secured.
- Reassess before movement, during movement if feasible, and immediately after arrival in Sick Bay.
- Given the injury pattern, urgent hoist evacuation at sea is likely appropriate once the patient is stable enough for transfer to the hoist evolution.

10. Teaching notes, reasons, and side comments

Teaching point	Why it matters
Do not chase repeated views in a bloody facial trauma airway.	Every repeated failed attempt worsens hypoxia, swelling, and time loss.
A declared failure trigger protects decision-making.	The team transitions faster when the threshold for abandoning Plan A is said aloud in advance.
Rescue airway equipment must be open before the first attempt.	Preparation delay is a common and avoidable cause of airway death in failed-airway events.
Post-placement maintenance starts immediately.	A technically successful cric can still fail from dislodgement, blockage, bleeding, or poor ventilation.
Movement is secondary to survivable airway control.	Transporting an unsecured failing airway in a shipboard passageway can convert salvageable to unsalvageable.

11. What can go wrong next?

- Tube dislodgement during packaging or movement.
- Persistent hypoxia because the tube is misplaced, obstructed, or the patient also has thoracic injury.
- Bleeding around the cric site causing visualization or airway maintenance difficulty.
- Unrecognized need for additional sedation, leading to agitation and self-injury.
- False reassurance after initial oxygen improvement while ventilation remains inadequate.
- Delayed evacuation despite local stabilization, leading to preventable later deterioration.

12. Communication, teleconsultation, and handover points

- State the clinical summary clearly: major facial trauma, failed oral airway, rescue surgical airway placed, currently ventilated.
- Report exact timing of failed oral attempt, time of surgical airway placement, current oxygenation/ventilation status, and any sedatives/analgesics given.
- Tell command early that this is a high-acuity casualty with definitive airway intervention and likely urgent off-ship evacuation requirement.

- If consulting remotely, be ready with: current vitals, airway status, confirmation method, bleeding concerns, other suspected injuries, and what resources remain onboard.

13. Key takeaways

- In a true failed airway, decisiveness saves the patient. Delay kills.
- Massive facial trauma plus blood can make oral intubation a poor plan from the start.
- One controlled attempt with a declared stop point is safer than repeated speculative attempts.
- A surgical airway is not the end of the problem - it creates a new maintenance burden.
- Shipboard movement and evacuation planning must follow airway rescue, not replace it.

End of Scenario 9

ACTT Scenario Companion Guide

Scenario 10: Shoulder Dislocation During Shipboard Work

Royal Canadian Navy Physician Assistant focus - guided teaching case

Scenario Snapshot

Primary domain	Orthopedic injury, analgesia, procedural sedation, shipboard movement and reassessment
Setting	Upper deck stores transfer while at sea in moderate swell; casualty starts on scene, then moves to Sick Bay
Main decision points	Reduce onboard now versus defer; analgesia only versus sedation-assisted reduction; hold onboard versus arrange later alongside assessment
Core procedures	Focused neurovascular exam, sling/immobilization, possible shoulder reduction, post-reduction reassessment
Main risk if mishandled	Missed fracture-dislocation, missed neurovascular injury, oversedation for a non-life-threatening problem, unnecessary movement or delay

Learning Objectives

- Run a shipboard scene assessment for an isolated but painful musculoskeletal injury without losing sight of hidden red flags.
- Decide what must be done on scene before movement and what can safely wait for Sick Bay.
- Perform and document the pre-reduction neurovascular examination and repeat it after every intervention.
- Choose between analgesia only, intra-articular/local approaches if available, sedation-assisted reduction, or no reduction onboard.
- Select a reasonable reduction technique for a likely anterior shoulder dislocation and know when to stop.
- Build a safe onboard plan when immediate MEDEVAC is not required but follow-up still matters.

Initial Setting and Presentation

Time and context: 1540 local. The ship is at sea, several hours from the next port, conducting routine upper-deck stores handling in moderate sea state. A 29-year-old sailor slips while controlling a load, grabs awkwardly with the right arm, and is pulled forward against a rail. There is no report of direct head strike, loss of consciousness, or chest trauma. He immediately clutches his right shoulder, reports severe pain, and says, "it popped out."

What the responding team sees: The casualty is standing with assistance, pale and anxious, leaning forward slightly, with the right arm held adducted and protected against the body. He refuses to move the shoulder. There is visible flattening of the normal shoulder contour. No major bleeding is seen. He is breathing comfortably and speaking full sentences.

Stage 1: Immediate Scene Priorities

- Confirm this is truly an isolated extremity injury and not part of a broader fall/trauma pattern.
- Control the environment first: prevent a second fall, clear loose gear, and keep the casualty from being forced to walk unsupported.
- Do a fast ABC check before narrowing onto the shoulder.

- Identify immediate red flags that would change the whole plan: altered mental status, chest trauma, open fracture, uncontrolled bleeding, absent distal pulse, rapidly increasing swelling, obvious humeral deformity, or severe distracting injuries.

Expected First Assessment on Scene

Check	Likely finding	Why it matters	Action if abnormal
Airway / breathing	Normal speech, no distress	Confirms you can keep attention on the limb without missing a bigger emergency	If compromised, treat that first and downgrade the shoulder as a secondary issue
Mental status	Alert and oriented	Makes immediate sedation unnecessary on scene	If confused, re-open the possibility of head injury or shock
Distal pulse / perfusion	Usually intact, but must be checked	Axillary or vascular injury is uncommon but cannot be missed	Absent or weak pulse pushes this toward urgent reduction or urgent transfer
Motor / sensation	Pain-limited movement; check hand grip, finger extension, light touch over deltoid patch and hand	Establishes a baseline before any manipulation	New neurologic deficit after reduction is a critical complication

Decision Point: Treat on Scene or Move Now?

Teaching answer: For this casualty, the likely best choice is brief on-scene stabilization followed by controlled movement to Sick Bay rather than attempting reduction on the upper deck. He is hemodynamically stable, the likely injury is painful but not immediately life-threatening, and the deck is a poor location for sedation or prolonged manipulation. On scene, you should:

- support the arm in the position of comfort,
- perform and document the initial neurovascular exam,
- give simple analgesia that does not create unnecessary monitoring burden, if available and appropriate,
- prepare an assisted movement plan so the casualty does not stumble or worsen the injury during transfer.

Stage 2: Movement to Sick Bay

The casualty does not require a Stokes litter solely for a routine, isolated shoulder dislocation if he can walk safely with support. However, ship movement matters. If pain, sea state, or presyncope make walking unsafe, use the simplest secure transport method that prevents another fall and protects the arm. The objective is not speed at all costs; it is safe transfer without converting a straightforward injury into a more complex one.

- Assign one person to support the casualty and one to carry gear/medications.
- Keep the arm supported across the torso; do not force range of motion during transfer.
- Reassess for dizziness, pallor, or new neurologic complaints during movement.
- If the casualty becomes presyncopal or increasingly distressed, stop, recheck vitals, and reconsider whether another injury was missed.

Stage 3: Sick Bay Assessment and Working Diagnosis

In Sick Bay, you now have a better environment for pain control, monitoring, and a fuller exam. The likely working diagnosis is an anterior shoulder dislocation, but the scenario should be taught as a diagnostic checkpoint, not an automatic assumption.

- Repeat ABCs and obtain baseline vitals.
- Inspect the shoulder for deformity, swelling, skin tenting, ecchymosis, or open injury.
- Palpate gently for clavicle, scapular, proximal humerus, and AC joint tenderness.

- Repeat the neurovascular exam: radial pulse, capillary refill, hand motor function, sensation in the axillary nerve distribution and distally.
- Ask for prior dislocations, prior surgery, connective tissue history, and whether this has reduced spontaneously before.

Red Flags That Should Push You Away From Routine Onboard Reduction

- Suspected fracture-dislocation or significant proximal humerus fracture.
- Open injury, gross swelling out of proportion, or skin compromise.
- Absent distal pulse or rapidly worsening perfusion.
- Progressive neurologic deficit.
- Unclear mechanism suggesting more than a simple anterior dislocation.
- Need for sedation that cannot be safely monitored with current staffing or sea conditions.

Stage 4: Management Options and Decision Logic

Option A - Reduce onboard now: Reasonable if the patient is stable, the presentation is classic for uncomplicated anterior dislocation, neurovascular status is intact, the team can monitor safely, and the operator is comfortable with a gentle, lower-force technique.

Option B - Analgesia, immobilize, and defer reduction: Reasonable if diagnostic uncertainty remains, sedation risk outweighs benefit, staffing is thin, or the casualty is tolerating the deformity while awaiting shore assessment.

Option C - Urgent evacuation/shore transfer: Needed if there is neurovascular compromise, suspected fracture-dislocation, failed reduction with worsening symptoms, or the local environment cannot support safe pain control and reassessment.

Teaching Choice for This Scenario

The guided teaching path assumes a stable, classic anterior dislocation with intact distal perfusion. The preferred learning route is a cautious onboard reduction attempt in Sick Bay using adequate analgesia and, only if needed, light procedural sedation. This allows the learner to practice decision discipline: reduce only because the pattern is suitable, not because every shoulder must be reduced immediately.

Stage 5: Analgesia and Sedation Planning

This is a useful scenario to teach restraint with medications. The injury is painful, but it is not automatically a sedate-everyone problem. Choose the lightest intervention that still lets you do the job safely.

Approach	When appropriate	Operational advantage	Main caution
Simple analgesia only	Cooperative patient, likely easy reduction, low force technique	Lowest monitoring burden	May be inadequate if spasm is severe
Opioid analgesia in careful titration	Significant pain but airway/respiratory risk acceptable	Good pain relief without full dissociation	Respiratory depression and nausea; reassess before repeating
Ketamine low-dose analgesia	Need pain control while preserving hemodynamics	Useful if you want pain relief without full sedation	Do not confuse analgesic dose with dissociative sedation dose
Sedation-assisted reduction	Anxious, guarded, or repeated failed gentle attempts	Improves relaxation and success odds	Creates a monitoring burden that may exceed what this low-acuity case actually needs

Practical teaching note: If sedation is used, the case should explicitly teach pre-sedation monitoring, airway readiness, role assignment, and post-reduction observation. For an uncomplicated shoulder, oversedating the patient can create more risk than the dislocation itself.

Stage 6: Reduction Execution

Use a gentle technique with low complication risk. For this teaching case, external rotation is an appropriate primary method. Cunningham can also be discussed if the patient can sit upright and cooperate. Kocher and Hippocratic methods should be specifically rejected.

Suggested Technique: External Rotation

1. Place the patient supine if practical, with the elbow flexed to 90 degrees and the arm adducted.
2. Explain that the movement must stay slow and that the patient should tell you when pain or muscle spasm increases.
3. Support the elbow and wrist; apply slow, steady external rotation without jerking.
4. Pause when the patient reaches a painful barrier. Maintain position and allow spasm to ease before advancing further.
5. Continue gradual rotation until reduction occurs or until resistance/pain suggests you should stop and reassess.

What You Are Watching For

- Sudden pain relief or a palpable/visible relocation of the humeral head.
- Improved resting posture of the arm.
- Patient willingness to move slightly after reduction.
- No new neurologic symptoms.
- No sudden loss of distal pulse.

When to Stop

- The patient cannot tolerate the maneuver despite appropriate analgesia.
- The pattern no longer feels like a simple anterior dislocation.
- You encounter marked mechanical resistance rather than muscle spasm.
- The patient develops worsening neurovascular symptoms.
- The required sedation or manpower burden is becoming disproportionate to the benefit.

Stage 7: Post-Reduction Priorities

- Repeat and document the full neurovascular examination immediately.
- Immobilize the shoulder in a sling or equivalent support.
- Reassess pain, vitals, and sedation effects if any medications were given.
- Confirm that the patient is not quietly becoming more sedated, nauseated, or vasovagal after the procedure.
- Document whether the reduction was clinically successful, partially successful, or unsuccessful.

If Reduction Fails

A failed gentle reduction does not automatically mean keep escalating force. In this scenario, failed reduction should usually shift the plan toward immobilization, analgesia, repeat neurovascular checks, and transfer for imaging/definitive care when operationally feasible, especially if the patient remains perfused and stable.

Stage 8: Evacuation and Disposition Decision

This scenario is intentionally different from the earlier high-acuity cases: the answer is often not immediate MEDEVAC. That is the teaching point. Not every casualty needs helicopter hoist or urgent jetty transfer simply because the injury is painful.

Disposition option	When it fits	When it does not fit
Continue onboard care with delayed follow-up	Successful reduction or tolerable unreduced dislocation, intact neurovascular exam, pain controlled,	Not appropriate if perfusion or neurology is worsening

	no red flags	
Jetty transfer when alongside or at next practical opportunity	Need imaging, failed reduction, persistent severe pain, suspected associated fracture, but patient is otherwise stable	Not ideal if there is acute neurovascular compromise requiring faster action
Urgent evacuation / higher-priority transfer	Absent pulse, progressive neurologic deficit, suspected fracture-dislocation, uncontrolled pain with unsafe onboard sedation needs	Unnecessary for a straightforward, stable dislocation

Communication, Handover, and Command Points

- If reducing onboard, brief the team that this is a controlled, non-life-threatening procedure and assign one person specifically to monitoring.
- If deferring reduction, communicate clearly that the patient is stable, perfused, and being managed conservatively pending shore review.
- If neurovascular compromise appears, state the change explicitly and upgrade urgency immediately.
- Document the time of injury, the pre- and post-reduction neurovascular exam, medications given, and whether the reduction succeeded.

Common Errors and Teaching Pitfalls

- Assuming every deformed shoulder is a simple dislocation and failing to consider fracture-dislocation.
- Failing to document the neurovascular exam before trying to reduce.
- Using more sedation than the case requires, then creating an avoidable airway-monitoring problem.
- Applying forceful or outdated reduction maneuvers that increase complication risk.
- Calling the case "minor" and skipping reassessment after the reduction attempt.
- Failing to recognize that a lower-acuity case still needs a deliberate onboard disposition decision.

Key Takeaways

- This scenario teaches disciplined restraint: not every painful casualty needs maximal intervention or urgent evacuation.
- The most important bedside actions are correct diagnosis framing, careful neurovascular checks, controlled analgesia, and safe technique selection.
- On a ship, the environment determines whether an otherwise simple reduction is safe to attempt onboard.
- For isolated orthopedic problems, the shipboard decision is often about sustainable care and timing of follow-up, not only emergency extraction.

End of Scenario 10

ACTT Scenario Companion Guide

Scenario 11: Pressor-Dependent Shock With Resource Strain

Royal Canadian Navy Physician Assistant Focus

1. Learning Objectives

- Recognize when persistent hypotension has progressed beyond simple fluid-responsive shock and requires vasopressor support.
- Apply bedside decision-making from first presentation in Sick Bay through escalation, resource management, and evacuation planning.
- Practice safe norepinephrine preparation, initiation, monitoring, and reassessment in a shipboard environment with limited staffing and equipment.
- Identify when a plan is clinically correct but operationally unsustainable because of line security, infusion-pump limits, staffing strain, or delayed evacuation.
- Reinforce prolonged-holding principles: trend monitoring, device checks, explicit handover, early teleconsultation, and recognition of worsening pressor dependence.

2. Initial Setting

Operating context: At sea, moderate sea state, helicopter available only by hoist, not deck landing. Estimated earliest extraction window is 6 to 8 hours if the weather holds.

Shipboard location: Patient first presents to Sick Bay after worsening symptoms during routine work. This is primarily a medical case rather than a scene-trauma case, but shipboard resource strain rapidly becomes part of the problem.

Available support: RCN PA, one assisting medic/medical technician, one additional non-clinical helper who can act as runner/observer, finite medication stock, limited infusion pumps, and standard monitoring available but not enough for ICU-style continuous one-to-one observation forever.

3. Initial Presentation

Narrative: A sailor in their 30s is brought to Sick Bay by a supervisor and a crewmate. Over the last 24 hours they have had fever, rigors, generalized weakness, and progressive shortness of breath. They now look pale, ill, and increasingly fatigued. They complain of dizziness when sitting up and say they feel "like I am going to pass out."

On arrival: The patient is alert but slowed. Skin is warm with delayed capillary refill. They are tachycardic, hypotensive, febrile, and mildly tachypneic. There is a productive cough and pleuritic discomfort, making pneumonia one likely source, but full source control is not yet possible onboard.

4. Immediate Assessment

- Airway: speaking, but fatigued; no immediate need for airway intervention.
- Breathing: increased work of breathing but still oxygenating; obtain SpO2 and reassess repeatedly.
- Circulation: hypotension and poor perfusion are the dominant immediate issue.

- Disability: mental status still interactive, but slowed; watch for worsening confusion as perfusion drops.
- Exposure: look for obvious alternate sources of infection, rash, bleeding, or signs this is not simple sepsis.

Initial likely working diagnosis: Sepsis progressing to septic shock, most likely pulmonary source, with the realistic possibility that the patient will become pressor-dependent before evacuation can occur.

5. First Decision Point: Immediate Actions in Sick Bay

This patient is already in the treatment space, so the "scene" question is less about packaging and more about whether you can stabilize here with current manpower and whether your first steps reduce or increase future workload.

- Place on monitor immediately: cardiac rhythm, BP cycling, SpO2, and EtCO2 if later required or available.
- Establish IV access quickly; if peripheral IV is difficult, do not waste excessive time. Escalate to IO if needed.
- Send or obtain bedside data that changes management: glucose, temperature, focused lung/chest findings, and any available point-of-care labs.
- Begin oxygen if saturation is falling or work of breathing increases.
- Start initial crystalloid resuscitation if clinically tolerated.
- Obtain cultures before antibiotics only if doing so does not meaningfully delay antibiotics.

6. Guided Walkthrough: Early Management

6.1 Fluid Phase

Start with a deliberate fluid trial rather than reflexively giving repeated large volumes without reassessment. In ACTT-relevant sepsis care, an initial crystalloid bolus is appropriate, but onboard management requires watching for the respiratory cost of each bolus.

- Give the first bolus and reassess BP, mental status, capillary refill, work of breathing, and oxygen requirement.
- If BP improves briefly but perfusion remains poor, do not assume the problem is solved.
- If crackles, rising oxygen need, or worsening respiratory distress appear, slow down and reassess rather than pushing more fluid automatically.

6.2 Antibiotic Phase

Once severe sepsis or septic shock is suspected, antibiotics belong early in the sequence. If pneumonia is the likely source, use the source-appropriate regimen from your ACTT study guide and shipboard stock. The key teaching point is timing: do not let "more data" delay appropriate empiric treatment.

- Document exact time antibiotics were started.
- Record likely source and why that regimen was chosen.
- If source remains unclear, use the broader empiric pathway and update later if the picture changes.

6.3 Transition to Shock Reassessment

After the initial fluid phase, the patient remains hypotensive. Their MAP is still below target, mentation is drifting, and urine output is poor. This is the key pivot point: you now have a patient who may require norepinephrine, but starting a pressor commits you to a much heavier monitoring burden.

7. Second Decision Point: Is This Now Pressor-Dependent Shock?

Indicators that the answer is yes:

- Persistent hypotension after initial resuscitation.
- Inadequate perfusion despite some fluid already given.
- Ongoing mental slowing, poor urine output, delayed capillary refill, or cool extremities as compensation begins to fail.
- The patient is no longer simply "dry" - they are failing to maintain pressure and perfusion.

This is where the scenario becomes a shipboard systems problem. Starting norepinephrine may be clinically appropriate, but you must immediately ask whether your line, pump, monitoring, and staffing plan are sustainable for the next several hours.

8. Norepinephrine Initiation

8.1 Preparation

- Confirm the indication: persistent hypotension and poor perfusion after initial resuscitation.
- Use an infusion pump. Do not run a pressor casually or without a controlled setup.
- If central access is not available, peripheral administration may be necessary, but now the IV site becomes a critical monitoring point.
- Label the line clearly and assign who is responsible for pump checks and IV site checks.

8.2 Starting the Infusion

Begin with the standard starting norepinephrine range used in your guide, then titrate toward a MAP of at least 65 mmHg while also watching the whole patient. A better blood pressure that is not matched by better perfusion is not true success.

- Record the exact starting dose and time.
- Cycle BP frequently during early titration.
- Watch mental status, skin perfusion, urine output, and trend - not just a single cuff number.

8.3 Immediate Monitoring Burden

- Frequent BP checks during titration.
- Frequent peripheral IV site checks if not centrally delivered.
- Repeated reassessment of extremity perfusion and line patency.
- Trend whether oxygen requirement is rising as fluids and shock evolve.

9. Shipboard Resource Strain

At this point the case shifts from straightforward septic shock treatment into a shipboard operational problem. The patient is now more stable than before, but only because a labor-intensive therapy is running. This is exactly the kind of case that can quietly fail if the team does not confront the resource burden directly.

- One infusion pump is now occupied for an unknown duration.
- One person must reliably watch the pressor and IV site, especially if the line is peripheral.
- The patient may worsen and require more oxygen, more frequent reassessment, or even airway escalation.

- The available clinical team may not be able to safely monitor this intensity of care indefinitely if the weather delays extraction.

Key teaching point: A patient who is temporarily supported by pressors is not "solved." They are often more fragile, not less, because the plan now depends on continuous maintenance.

10. Third Decision Point: Evacuate Now, Prepare Hoist, or Hold

Because the patient is now pressor-dependent, you must decide quickly whether the ship can safely continue the hold or whether this has already exceeded what should be maintained onboard.

10.1 If Immediate Extraction Is Realistically Available

- Pressor dependence should push you toward early evacuation planning, not watchful waiting.
- A patient whose blood pressure is being pharmacologically supported can deteriorate rapidly if the line fails, the pump stops, or staffing lapses.
- If hoist extraction is feasible within a reasonable time, start packaging early rather than waiting for the patient to worsen.

10.2 If Weather or Position Delays Extraction

- Convert immediately to a structured prolonged-hold plan.
- Declare explicit reassessment intervals.
- Track BP/MAP, mental status, urine output, oxygen requirement, IV site condition, and infusion dose changes.
- Reassess whether the patient is becoming increasingly pressor-dependent rather than stabilizing.

11. Movement and Packaging Considerations

If the patient must be moved for hoist preparation or transfer to another safer holding location, the move itself can create deterioration. Pressor-supported shock is a line-security and device-security problem as much as a hemodynamic one.

- Secure the IV line and pump before any movement.
- Assign one person to the patient, one to the pressor line/pump, and one to movement support.
- Move only if the destination improves safety or evacuation access.
- Reassess before and after the move - do not assume the patient tolerated it just because the transfer finished.

12. Teaching Notes and Side Notes

12.1 Why This Scenario Matters

This case teaches that septic shock onboard is not only about recognizing sepsis and starting antibiotics. The harder question is what happens after you make the correct decision to start a pressor. A correct clinical intervention can expose a weak operational system.

12.2 Side Note: Pressors Can Mask Deterioration

The blood pressure may look better while perfusion, oxygenation, and reserve still worsen. Continue to track mental status, urine output, and overall trajectory. Do not let a single improved MAP falsely reassure the team.

12.3 Side Note: Peripheral Pressor Use

Peripheral norepinephrine may be necessary, but it creates a hidden second emergency risk: extravasation. If the line infiltrates and no one notices, tissue injury can occur quickly and the patient may abruptly lose hemodynamic support.

12.4 Side Note: Sustainable Care vs Ideal Care

The right plan is the plan that can be safely maintained by the actual team you have. Sometimes the most important decision is recognizing that the ship can no longer safely sustain the monitoring burden, even if the patient is technically still alive and "holding" for the moment.

13. Medication Notes

- Crystalloid: use condition-appropriate fluid, but reassess after each bolus. Do not keep giving fluid blindly once respiratory cost rises or benefit plateaus.
- Empiric antibiotics: start within the severe sepsis/septic shock treatment window; document exact timing and chosen source-based regimen.
- Norepinephrine: first-line pressor for persistent hypotension after initial resuscitation. Use pump-based delivery, titrate deliberately, and assign monitoring responsibility.
- Phentolamine: must be conceptually ready as the rescue treatment for peripheral pressor extravasation if available in your setting.

14. Teleconsultation and Command Communication

This patient should trigger early remote consultation, not late consultation. The call should happen once it is clear that the patient is moving toward or has already entered pressor-dependent shock.

- State the likely diagnosis, current MAP/BP trend, fluid already given, antibiotics started, current norepinephrine dose, oxygen requirement, and current access.
- State the operational problem clearly: limited staff, limited pumps, at-sea extraction constraint, and concern about sustainability of ongoing pressor care.
- Communicate to command that this is no longer a routine sick case - it now carries manpower, equipment, and evacuation implications.

15. What Could Go Wrong Next

- Increasing pressor requirement despite initial response.
- Peripheral IV extravasation with sudden loss of support.
- Progressive respiratory failure after fluids and ongoing sepsis.
- Worsening confusion indicating perfusion failure or sepsis progression.
- Missed antibiotic timing because the team became fixated on the blood pressure.
- Poor handover causing dose changes, missed site checks, or duplicated fluids.

16. Key Takeaways

- Persistent hypotension after initial fluid resuscitation should prompt deliberate reassessment for pressor-dependent shock.
- Starting norepinephrine is both a clinical decision and a systems decision: line security, pump availability, staffing, and reassessment burden all matter.

- A better blood pressure alone is not enough; perfusion and trend determine whether the patient is truly improving.
- Pressor dependence should lower the threshold for early evacuation planning and teleconsultation.
- If evacuation is delayed, convert immediately to a structured prolonged-hold plan with explicit monitoring, documentation, and handover rhythm.

ACTT Scenario Companion Guide

Scenario 12: Chest Tube Patient Who Re-Deteriorates During Holding

Royal Canadian Navy Physician Assistant Focus

Learning Objectives

- Recognize when a patient with an apparently functioning chest tube is becoming unstable again.
- Distinguish between recurrence of tension physiology, tube obstruction, tube dislodgement, ongoing hemorrhage, and alternate causes of deterioration.
- Apply structured reassessment before repeating interventions.
- Manage chest tube troubleshooting in a shipboard environment with delayed evacuation and limited monitoring.
- Decide when local management is sufficient and when evacuation or urgent teleconsultation is required.

Initial Setting

The ship is at sea in moderate weather. A sailor sustained blunt chest trauma earlier in the day during a heavy-equipment mishap on the vehicle deck. A left-sided tension pneumothorax was suspected, needle decompression was performed on scene, and the casualty was moved to Sick Bay where a left chest tube was inserted. The patient initially improved. Three hours later, during the prolonged holding phase, the patient begins to deteriorate again.

Starting Baseline in Sick Bay

At the start of the holding period, after chest tube insertion, the patient was:

- Alert but uncomfortable, speaking in short phrases.
- SpO2 96% on supplemental oxygen.
- HR 108, BP 112/72, RR 24.
- Left chest tube connected to drainage system, secured and initially bubbling with improvement in breath sounds.
- Pain managed with titrated analgesia.
- Evacuation requested, but earliest likely extraction remains several hours away.

Scenario Trigger

Three hours into observation, the monitor shows SpO2 drifting down to 90-92% despite unchanged oxygen delivery. The patient becomes more tachycardic, more anxious, and reports worsening left chest pain and increasing shortness of breath. Blood pressure trends down to 96/60. The team must assume that the patient is no longer stable and shift from maintenance mode back to acute reassessment.

Immediate Actions

- Reassess airway, breathing, and circulation immediately. Do not assume the chest tube is still solving the original problem.
- Increase observation intensity: pulse oximetry, cardiac monitor, repeat blood pressure, and repeat focused respiratory exam.

- Assign explicit roles: one person reassesses the patient, one checks the chest tube system from patient to collection chamber, one prepares backup equipment.
- Call out the key concern: “Chest trauma patient with chest tube is re-deteriorating - reassessing for recurrent tension, blockage, dislodgement, hemorrhage, or alternate cause.”

Decision Point 1: What Could Be Happening?

The guided differential should remain narrow and operational:

- Recurrent tension pneumothorax because the tube is blocked, kinked, clamped, malpositioned, or no longer in the pleural space.
- Persistent air leak with ineffective drainage.
- Hemothorax or worsening intrathoracic bleeding.
- Chest tube dislodgement or partial pull-back during movement or repositioning.
- Tube occlusion from clot, dependent loop, or compressed tubing.
- Alternate deterioration unrelated to the tube, such as worsening pulmonary contusion, pain splinting, sedation-related hypoventilation, or evolving shock.

Focused Reassessment Sequence

Patient exam

- Compare work of breathing to prior baseline.
- Repeat bilateral chest auscultation.
- Check for tracheal shift if obvious, chest wall asymmetry, increasing respiratory distress, and skin perfusion.
- Assess mental status: is the patient more agitated from hypoxia, pain, or shock?

Chest tube circuit check

- Trace the entire system from insertion site to collection device.
- Look for kinks, dependent loops, clamped tubing, disconnected segments, and a drainage unit positioned incorrectly.
- Inspect for ongoing bubbling, loss of expected fluctuation, sudden cessation of output, or obvious clot burden.
- Confirm the tube is still well secured at the skin and has not partially migrated.

Insertion site and dressing check

- Inspect for new subcutaneous emphysema, leakage around the tube, loose sutures, or dressing disruption.
- Check whether the tube marking at skin level has changed from the original documented depth.

Hemodynamic check

- Trend heart rate, blood pressure, capillary refill, and skin temperature.
- Consider whether falling pressure reflects worsening obstructive physiology, ongoing blood loss, or both.

Decision Point 2: Recurrent Tension vs Tube Problem vs Bleeding

If the patient has worsening respiratory distress, worsening unilateral breath sounds, rising tachycardia, falling blood pressure, and the tube appears nonfunctional, the safest assumption is that tension physiology may be recurring. In that case, treat the clinical problem first rather than waiting for certainty.

Reasonable actions depending on findings:

- If the chest tube is clearly kinked, clamped, or compressed: correct the mechanical issue immediately and reassess within minutes.
- If the tubing is obstructed by clot and the system is not draining: attempt to restore patency only within the limits of your equipment and training, while preparing for further intervention.
- If the tube appears dislodged or clearly out of position: treat it as failed pleural drainage and prepare for replacement.
- If recurrent tension is strongly suspected and the patient is unstable: be prepared to perform immediate decompression again while arranging definitive correction.
- If output suggests significant blood loss or the patient is drifting into hemorrhagic shock: prioritize perfusion, reassess for hemothorax, and escalate evacuation urgency.

Guided Walkthrough: Preferred Management Sequence

1. Declare deterioration early and convert the team from routine holding checks to active resuscitation mode.
2. Repeat the primary survey with emphasis on breathing and circulation.
3. Increase oxygen delivery and optimize patient position if not contraindicated.
4. Perform a complete chest tube system inspection before assuming the device is functioning.
5. If a simple mechanical problem is found (kink, dependent loop, clamp, loose connection), correct it immediately and reassess.
6. If respiratory distress and hemodynamic compromise persist despite a corrected system - or if the tube appears nonfunctional - prepare for immediate further chest intervention.
7. If recurrent tension physiology remains likely in an unstable patient, do not delay decompression because a chest tube is already present. A failed tube can behave like no tube.
8. After any repeat decompression or tube intervention, reassess breath sounds, SpO2, blood pressure, work of breathing, and mental status right away.
9. Re-document the new tube status, insertion depth, system setup, and the patient response.
10. Escalate external support early if the patient is worsening, the tube cannot be kept functional, or blood loss / respiratory burden is increasing.

Teaching Notes

- A chest tube that was functioning earlier can fail later. Never treat initial improvement as proof of ongoing stability.
- In delayed MEDEVAC situations, device maintenance becomes part of critical care. The procedure is not finished at placement.
- Re-deterioration should trigger a structured search for the reversible cause, but if tension physiology is clinically likely in an unstable patient, treatment should not be delayed.
- A patient can have both respiratory re-deterioration and worsening blood loss. Do not anchor on one explanation too early.
- At sea, tube securement matters more than on land. Movement, repositioning, stretcher transfers, and fatigue all increase dislodgement risk.

Medication Notes

- Analgesia may need re-titration because pain can worsen with recurrent pleural pathology, but avoid masking respiratory decline with repeated sedating doses before reassessment.
- If opioids or benzodiazepines were recently given, consider medication-related hypoventilation as a contributor and reassess timing, dose totals, and airway adequacy.

- If hypotension is worsening, any pressor use must not distract from correcting the underlying mechanical chest problem.

Procedure Notes

- Repeat needle decompression may be appropriate if the patient is crashing and recurrent tension is strongly suspected.
- If the chest tube is clearly nonfunctional or displaced, replacement may be required.
- After any corrective intervention, document what changed physically in the system and how the patient responded.

Evacuation and Escalation Decision

This scenario should push the clinician to reassess evacuation urgency. A patient whose respiratory status is worsening despite an existing chest tube is no longer a routine hold.

- If the patient re-stabilizes after correcting a simple mechanical issue and monitoring remains reliable, continued holding may be temporarily acceptable with intensified reassessment.
- If repeat decompression or tube replacement is needed, evacuation priority increases significantly.
- If there is rising oxygen requirement, persistent hypotension, suspected ongoing intrathoracic bleeding, or inability to keep the drainage system functioning, local holding may no longer be safe.
- Teleconsultation should be early, not late, especially if resources are limited or recurrent thoracic intervention is being considered.

Shipboard Operational Notes

- Secure the drainage system so it cannot tip, pull, or kink with ship movement.
- During any casualty movement, one assigned person should protect the tube and tubing only.
- Avoid clutter around the bedside that obscures the visible path from patient to drainage unit.
- Build chest tube checks into every reassessment cycle during prolonged holding.

What Could Go Wrong Next

- Re-tension after temporary improvement.
- Progressive hemothorax with falling blood pressure.
- Tube dislodgement during transfer.
- Sedation-related masking of worsening respiratory failure.
- Team assumes “the tube is in, so the chest problem is handled” and misses slow deterioration.

Key Takeaways

- Initial improvement after chest tube placement does not remove the need for ongoing surveillance.
- A re-deteriorating chest trauma patient requires immediate reassessment of the patient and the entire drainage system.
- If recurrent tension physiology is likely in an unstable patient, act clinically and do not delay because a chest tube is already present.
- At sea, device function and securement are part of life-saving care, not minor maintenance tasks.
- A deteriorating chest tube patient should trigger earlier escalation, tighter monitoring, and renewed evacuation planning.