

# ATLS (10<sup>th</sup> ed.) Revisions Future of Trauma

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# ATLS REVISIONS

A BRIEF OVERVIEW

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# ATLS UPDATE

TENTH EDITION

THIS PRESENTATION IS NOT INTENDED TO PROVIDE AN UPDATE FOR  
PROVIDERS/INSTRUCTORS/FACULTY

# ADVANCED TRAUMA LIFE SUPPORT 10 TH REVISIONS

- WHY ?
- WHAT ARE THE CONTENT REVISIONS ?
- WHAT ARE THE COURSE OFFERING REVISIONS ?

# WHY UPDATES ?

- Content changes based upon new science and practice --- not just USA but world wide
- Presentation/education changes based upon new science/studies to improve : learning environment ,learning participation ,content retention , psychomotor /skill use after the course in the first hour of trauma care
- Course teaching / facilitation changes to achieve the above goals



# ATLS 10th edition instructor update Content and skill station changes

Tenth Edition



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ON **TRAUMA**

**ATLS**<sup>™</sup>  
ADVANCED TRAUMA LIFE SUPPORT



AMERICAN COLLEGE OF SURGEONS  
*Inspiring Quality:  
Highest Standards, Better Outcomes*

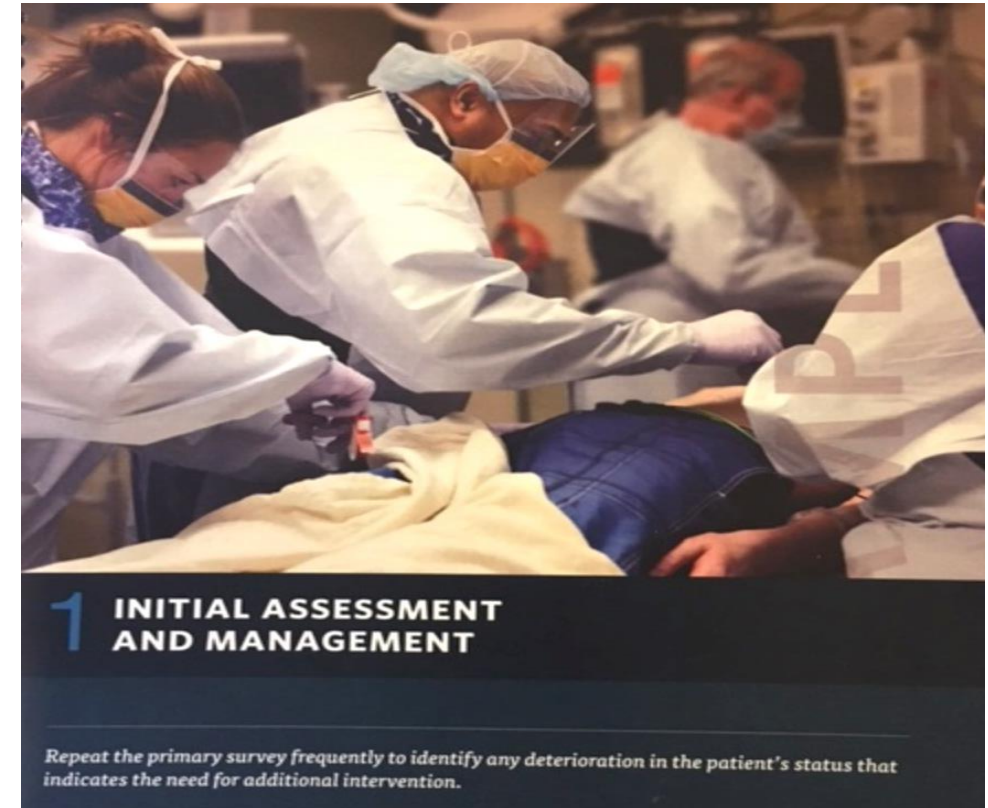
100+years

# FACULTY

**No restrictions on teaching skill stations !**

**Any faculty regardless of sub-specialty can teach any skill station including surgical skills embedded in the skill station!**

- Initial fluid bolus of 1 liter of WARMED FLUID may be required. Fluids are administered judiciously, as aggressive resuscitation before control of bleeding has been demonstrated to increase mortality.
- Coagulopathy associated with severe trauma can be fueled by resuscitative measures. Use of massive transfusion protocols with blood components administered at predefined low ratios may mitigate this.





## Be Prepared

### Equipment:

Suction, O<sub>2</sub> oropharyngeal and nasopharyngeal airways, bag-mask, laryngoscope, gum elastic bougie (GEB), extraglottic devices, surgical or needle cricothyroidotomy kit, endotracheal tubes, pulse oximetry, CO<sub>2</sub> detection device, drugs

Restrict cervical spinal motion!

CONTENT UPDATE: CHAPTER 2 AIRWAY AND VENTILATORY MANAGEMENT

### Preoxygenate

O<sub>2</sub> +/- bag-mask +/- oral airway +/- nasal airway

Able to oxygenate

NO

Definitive airway/Surgical airway

YES

Assess airway anatomy  
Predict ease of intubation (LEMON)

DIFFICULT

EASY

Intubation +/- drug-assisted intubation  
Cricoid pressure

UNSUCCESSFUL

Consider adjunct  
(e.g. GEB/LMA/LTA)

Definitive airway/Surgical airway

Call for assistance, if available

Consider awake intubation

**Change term RSI (rapid sequence intubation) to DAI (Drug Assisted Intubation)**



# CONTENT UPDATE: CHAPTER SHOCK

- Fluid resuscitation 1 L warm crystalloid
- Minimum 18 gauge peripheral access X 2
- Choice of site for alternate access based on clinician experience and skill
- Early resuscitation with blood and blood products must be considered in patients with evidence of class III and IV hemorrhage. Early administration of blood products at a low ratio of packed red blood cells to plasma and platelets can prevent the development of coagulopathy and thrombocytopenia.



# CONTENT UPDATE: CHAPTER 3 SHOCK

- Massive transfusion define as  $> 10$  units pRBC in 24 hours or more than 4 units in 1 hour.
- Some jurisdictions administer tranexamic acid in pre-hospital setting to severely injured patients in response to studies that demonstrated improved survival when this drug is administered within 3 hours of injury. The first dose is usually given over 10 minutes and is administered in the field; the follow up dose of 1 gram is given over 8 hours.



# CONTENT UPDATE: CHAPTER 3 SHOCK

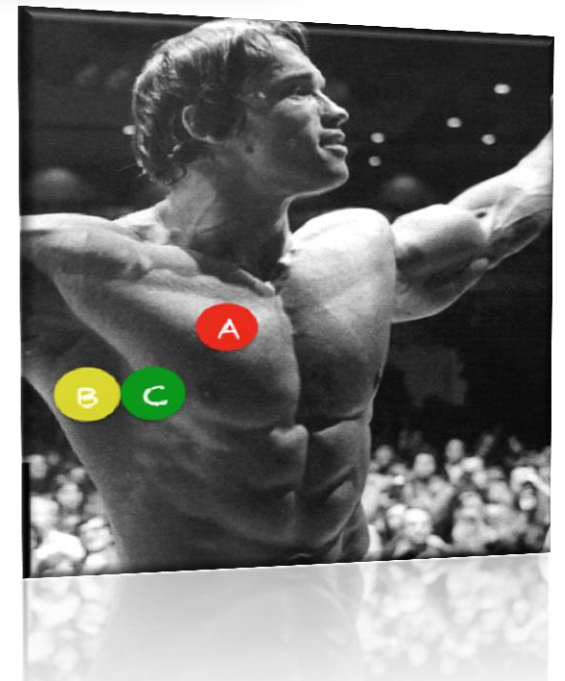
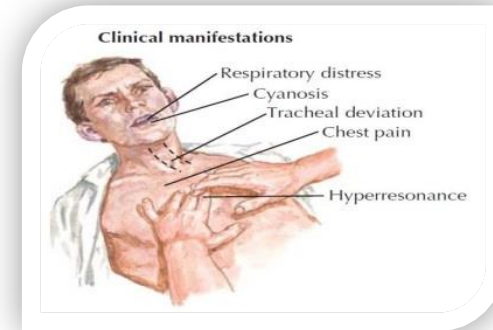
Parameter	Class I	Class II (mild)	Class III (moderate)	Class IV (severe)
Approximate blood loss	< 15 %	15–30%	31–40%	> 40%
Heart rate	↔	↔ / ↑	↑	↑ / ↑ ↑
Blood pressure	↔	↔	↔ / ↓	↓
Pulse pressure	↔	↓	↓	↓
Respiratory rate	↔	↔	↔ / ↑	↑
Urine Output	↔	↔	↓	↓↓
GCS	↔	↔	↓	↓
Base deficit	0 to –2 mEq/L	–2 to –6 mEq/L	–6 to –10 mEq/L	–10 mEq/L or more
Need for Blood Products	Monitor	Possible	Yes	MTP



# CONTENT UPDATE: CHAPTER 4 THORACIC TRAUMA

## Tension pneumothorax

- Presentation
  - Spontaneous ventilation – air hunger, desaturation
  - Mechanical ventilation- hemodynamic compromise
- Treatment
  - Decompression
    - Needle
      - Site – 4<sup>th</sup> or 5<sup>th</sup> ICS Adults MID AXILARY LINE
      - may fail by kinking or CW thickness
    - Finger

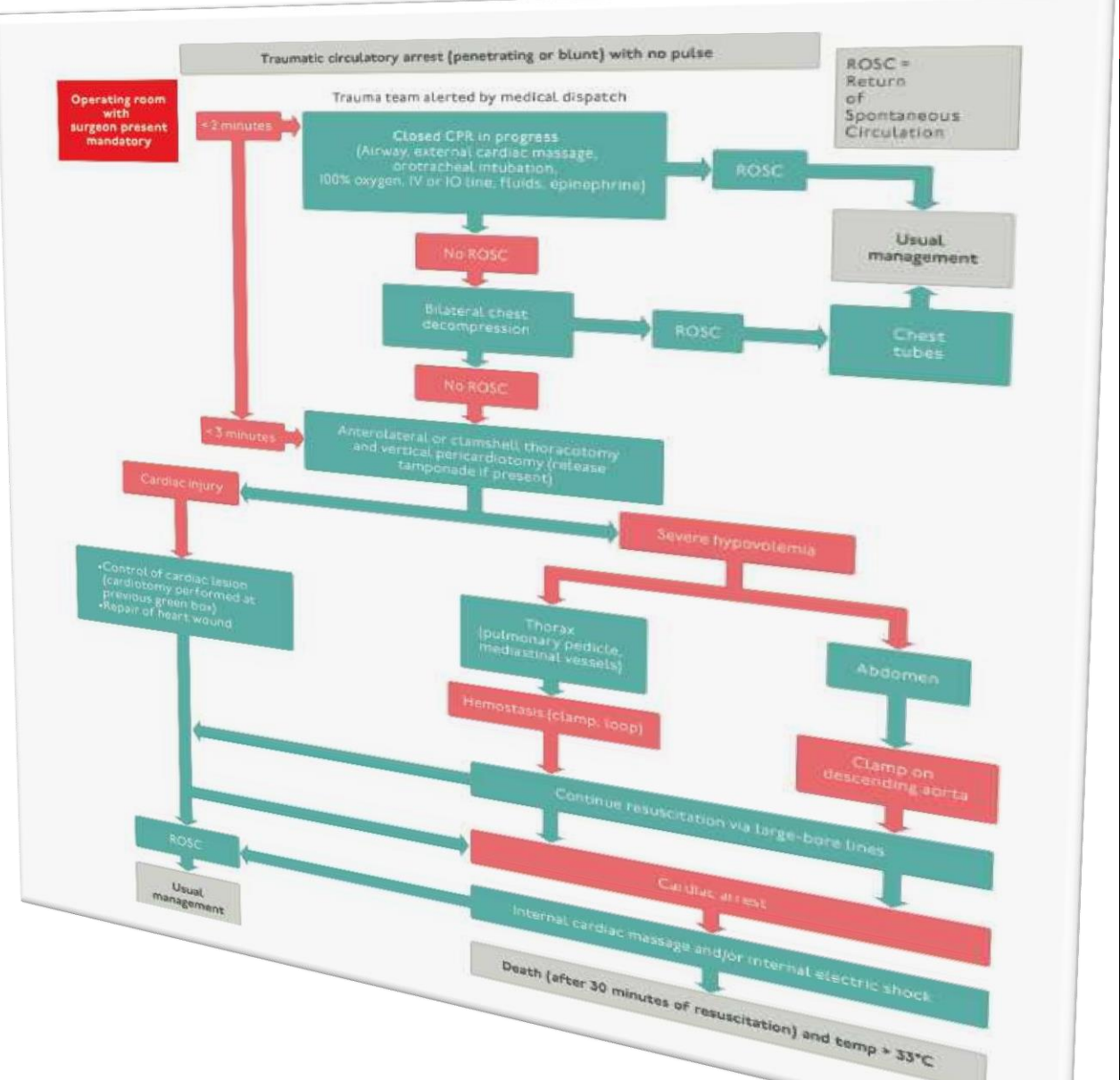


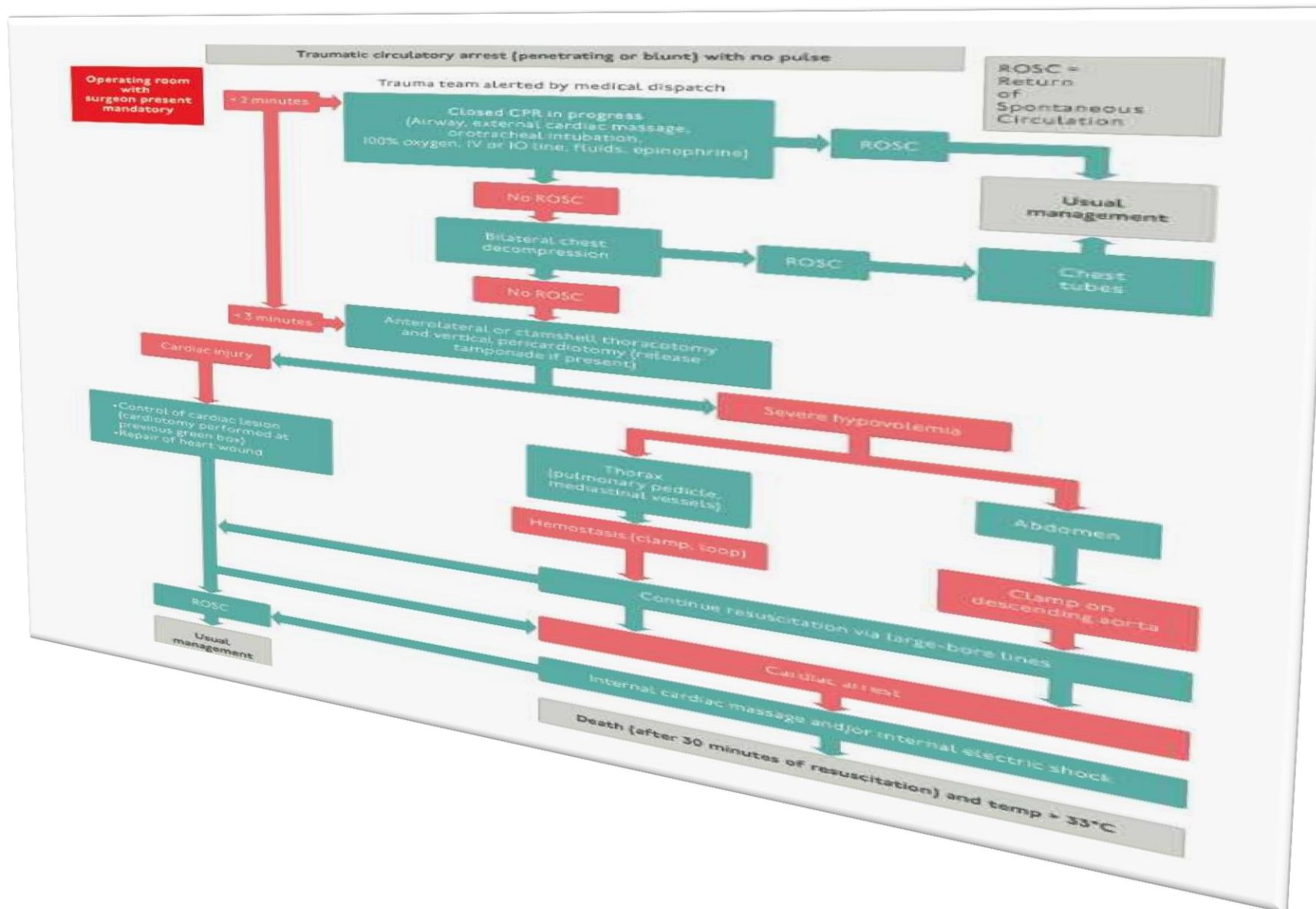
Hemothorax (smaller just as good)

- CT size 28-32 F

Blunt aortic injury medical management

- HR and BP control ↓ rupture
- Targets HR = 80 MAP = 60-70 mm HG if no contraindications

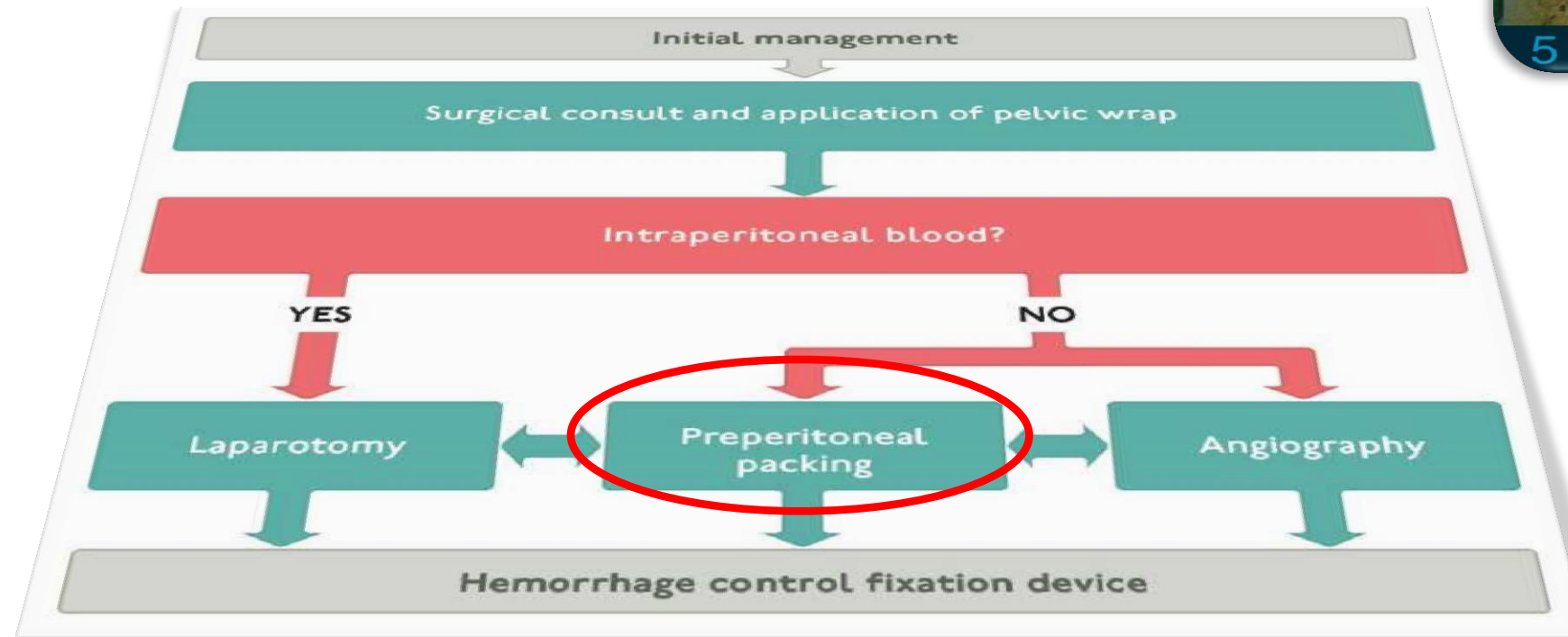






## CONTENT UPDATE: CHAPTER 5 ABDOMEN AND PELVIC TRAUMA

- Include blast mechanism in addition to penetrating and blunt injury.
- Palpation of the prostate gland is not a reliable sign of urethral injury







# CONTENT UPDATE: CHAPTER 6 HEAD TRAUMA

TABLE 6-2 GLASGOW COMA SCALE (GCS)

ORIGINAL SCALE		REVISED SCALE	SCORE
Eye Opening (E)		Eye Opening (E)	
Spontaneous		Spontaneous	4
To speech		To sound	3
To pain		To pressure	2
None		None	1
		Non-testable	NT
Verbal Response (V)		Verbal Response (V)	
Oriented		Oriented	5
Confused conversation		Confused	4
Inappropriate words		Words	3
Incomprehensible sounds		Sounds	2
None		None	1
		Non-testable	NT
Best Motor Response (M)		Best Motor Response (M)	
Obeys commands		Obeys commands	6
Localizes pain		Localizing	5
Flexion withdrawal to pain		Normal flexion	4
Abnormal flexion (decorticate)		Abnormal flexion	3
Extension (decerebrate)		Extension	2
None (flaccid)		None	1
		Non-testable	NT

# CONTENT UPDATE: CHAPTER 6 HEAD TRAUMA

## BOX 6-1 NEUROSURGICAL CONSULTATION FOR PATIENTS WITH TBI

When consulting a neurosurgeon about a patient with TBI, communicate the following information:

- Patient age
- Mechanism and time of injury
- Patient's respiratory and cardiovascular status (particularly blood pressure and oxygen saturation)
- Results of the neurological examination, including the GCS score (particularly the motor response), pupil size, and reaction to light
- Presence of any focal neurological deficits
- Presence of suspected abnormal neuromuscular status
- Presence and type of associated injuries
- Results of diagnostic studies, particularly CT scan (if available)
- Treatment of hypotension or hypoxia
- Use of anticoagulants



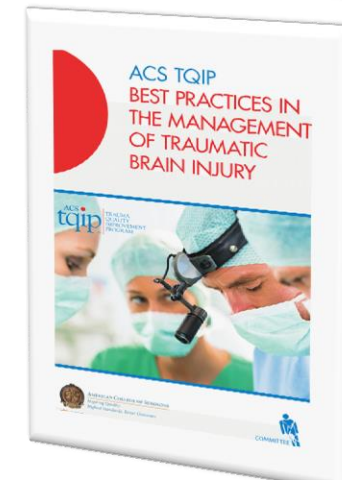
TABLE 6-6 ANTICOAGULATION REVERSAL

ANTICOAGULANT	TREATMENT	COMMENTS
Antiplatelets (e.g., aspirin, plavix)	Platelets	May need to repeat; consider desmopressin acetate (Deamino-Delta-D-Arginine Vasopressin)
Coumadin (warfarin)	FFP, Vitamin K, prothrombin complex concentrate (Kcentra), Factor VIIa	Normalize INR; avoid fluid overload in elderly patients and patients who sustained cardiac injury
Heparin	Protamine sulfate	Monitor PTT
Low molecular weight heparin, e.g., Lovenox (enoxaparin)	Protamine sulfate	N/A
Direct thrombin inhibitors: dabigatran etexilate (Pradaxa)	idarucizumab (Praxbind)	May benefit from prothrombin complex concentrate (e.g., Kcentra)
Xarelto (rivaroxaban)	N/A	May benefit from prothrombin complex concentrate (e.g., Kcentra)

# CONTENT UPDATE: CHAPTER 6 HEAD TRAUMA

**Evidence based treatment guidelines introduced: including the BTF 4<sup>th</sup> edition TBI guidelines and the ACS TQIP best practices in the management of TBI**

- Prolonged hyperventilation with  $PCO_2 < 25$  mm Hg is not recommended (Guidelines IIB).
- Maintain systolic blood pressure (SBP) at  $\geq 100$  mmHg for patients 50 to 69 years or at  $\geq 110$  mm Hg or higher for patients 15 to 49 years or older than 70 years; this may decrease mortality and improve outcomes (III)
- Although propofol is recommended for the control of ICP, it is not recommended for improvement in mortality or 6-month outcomes. Caution is required as high-dose propofol can produce significant morbidity.
- Mannitol 0.25-1 g/Kg to control ICP avoid arterial hypotension

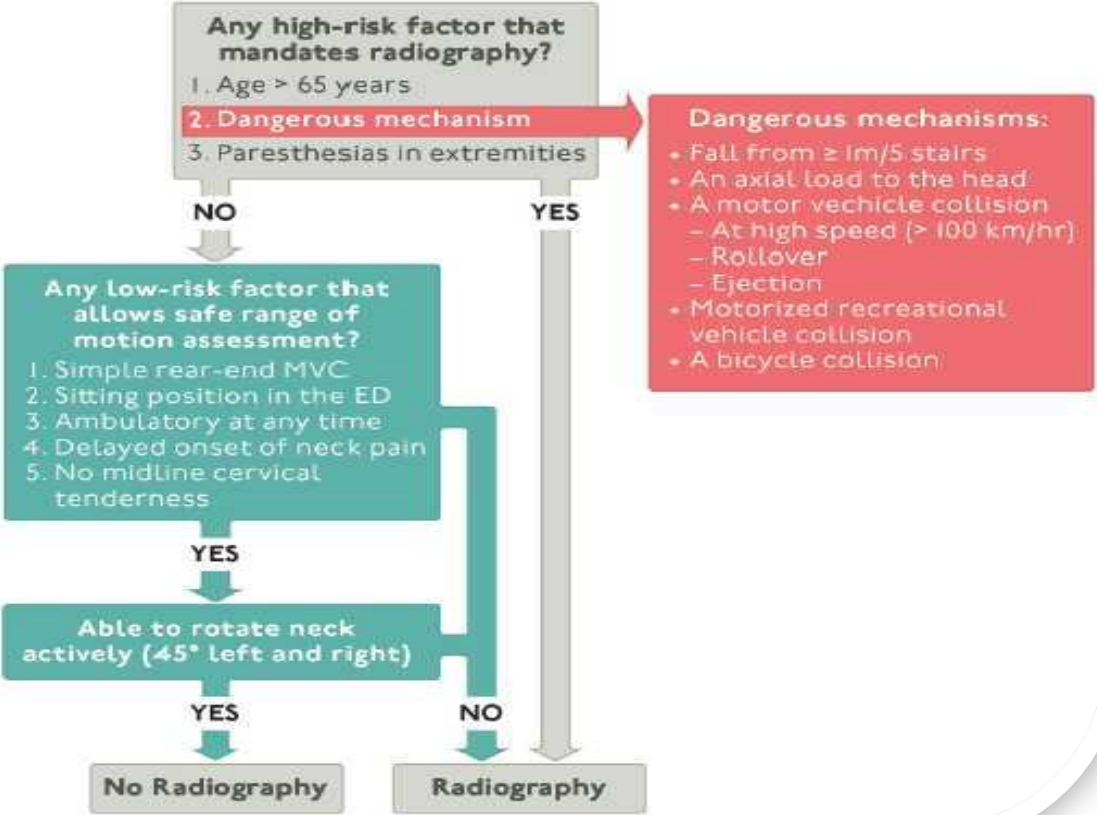




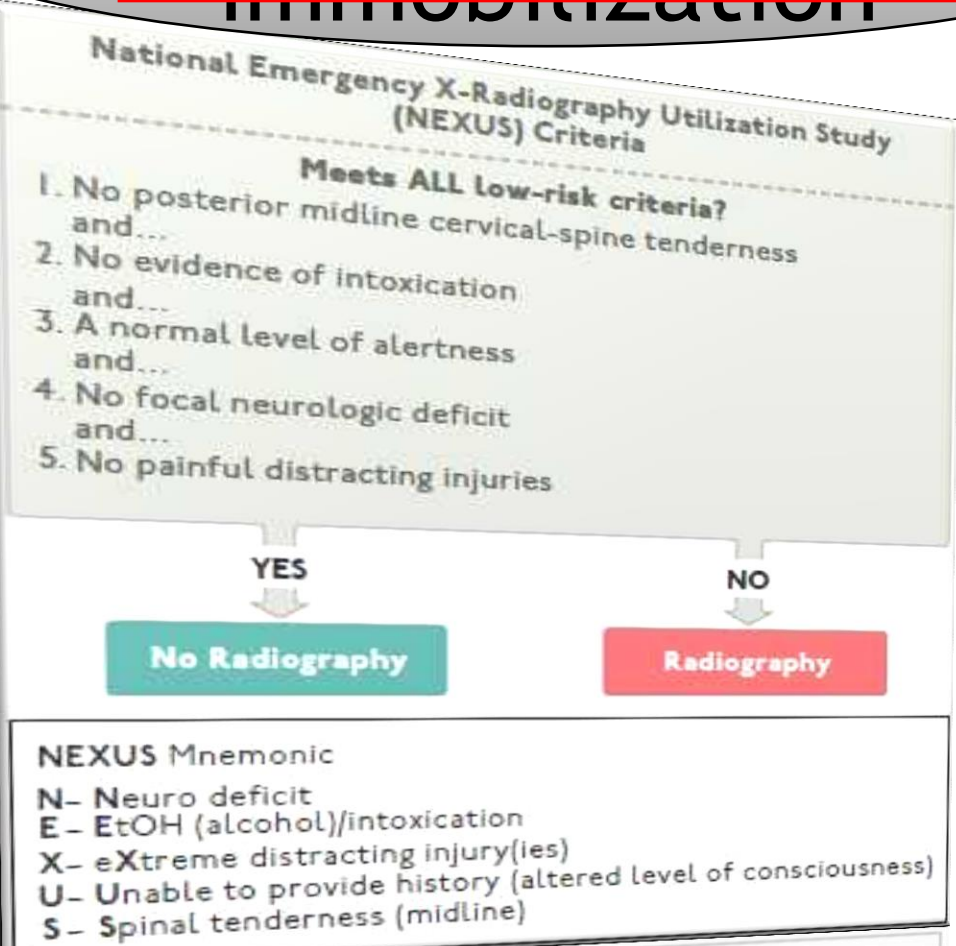


Canadian C-spine Rule (CCR)

For alert (GCS score =15) and stable trauma patients in whom cervical spine injury is a concern:



Spinal  
Spinal motion restriction  
~~immobilization~~





- Fluid resuscitation for patient with deep partial and full thickness burns involving  $\geq 20\%$  BSA should begin with  $2ml$  of Lactated ringer's X patient's weight in kg X % BSA burn
- Fluid is titrated based on adequacy of the urine output.
- Avoid fluid boluses unless the patient is hypotensive.
- Resuscitate pediatric patients using  $3ml/kg/\%TBSA$

**Use of Don't be a DOPE mnemonic to remember common causes of deterioration in intubated patients.**

- D dislodgement
- O obstruction
- P pneumothorax
- E equipment failure

***Note no change in site for needle decompression in children 2<sup>nd</sup> intercostal space mid clavicular line.***



**Damage control resuscitation in children represents a move toward limiting crystalloid resuscitation.**

- 20 ml/kg bolus
- 10-20 ml/kg of PRBC
- 10-20 ml/kg of fresh frozen plasma and platelet as part of massive transfusion protocol
- No survival advantage has been demonstrated





### **Preexisting conditions impact morbidity and mortality.**

- The five that appear to influence outcome in trauma patients are cirrhosis, congenital coagulopathy, chronic obstructive pulmonary disease, ischemic heart disease and diabetes mellitus
- Patients with one or more of these PECs twice as likely to die as those without.

### **Mortality from pelvic fracture 4 X higher in older than younger patients**

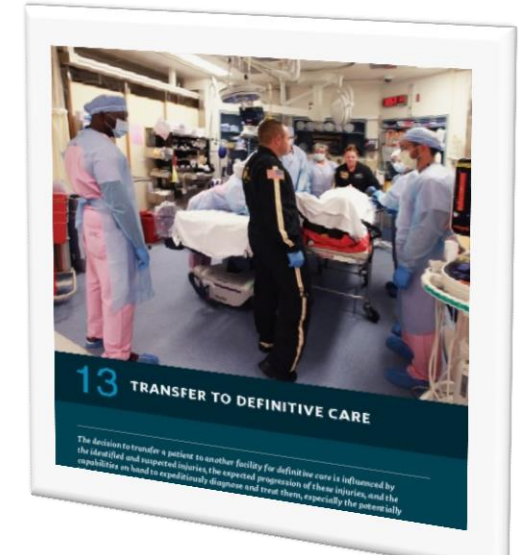
- Need for blood transfusion even with stable fracture is higher
- Longer hospital stays and less return to independent lifestyles





## **Significant portion of trauma patients transferred to regional trauma centers undergo CT scanning at the primary hospital**

- Increased length of stay before transfer
- Much of the time delay between injury and transfer is related to performing diagnostic studies despite lack of a surgeon to provide definitive care.



## **CT scans done before transfer to definitive care are often repeated upon arrival to the trauma center**

- Making the necessity of a pre-transfer CT questionable.
- Multiple scans result in increased radiation exposure and additional hospital costs



CONTENT UPDATE: CHAPTER 13 TRANSFER TO DEFINITIVE CARE



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TABLE 13-2 SAMPLE ABC-SBAR TEMPLATE FOR TRANSFER OF TRAUMA PATIENTS

ACRONYM	MEANING	INFORMATION TO PROVIDE
A	Airway	All airway, breathing, and circulation problems identified and interventions performed
B	Breathing	
C	Circulation	
S	Situation	Patient Name Age Referring Facility Referring physician name Reporting nurse name Indication for transfer IV access site IV fluid and rate Other interventions completed
B	Background	Event history AMPLE assessment Blood products Medications given (date and time) Imaging performed Splinting
A	Assessment	Vital signs Pertinent physical exam findings Patient response to treatment
R	Recommendation	Transport mode Level of transport care Medication intervention during transport Needed assessments and interventions

## BOX 13-1 QUESTIONS THAT CAN ASSIST IN DETERMINING APPROPRIATE TRANSPORT MODE

- Does the patient's clinical condition require minimization of time spent out of the hospital environment during the transport?
- Does the patient require specific or time-sensitive evaluation or treatment that is not available at the referring facility?
- Is the patient located in an area that is inaccessible to ground transport?
- What are the current and predicted weather situations along the transport route?
- Is the weight of the patient (plus the weight of required equipment and transport personnel) within allowable ranges for air transport?
- For interhospital transports, is there a helipad and/or airport near the referring hospital?
- Does the patient require critical care life support (e.g., monitoring personnel, specific medications, specific equipment) during transport, which is not available with ground transport options?
- Would use of local ground transport leave the local area without adequate emergency medical services coverage?
- If local ground transport is not an option, can the needs of the patient (and the system) be met by an available regional ground critical care transport service (i.e., specialized surface transport systems operated by hospitals and/or air medical programs)?



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# SCENARIO-BASED EDUCATION

- What is scenario-based education in ATLS ?
- What is meant by an unfolding case scenario ?
- How is it different from a case presentation ?



## Case Scenario

- M** 43-year-old obese restrained driver lost control of his small vehicle while traveling at a high speed on an icy road; crashed driver's side into a large tree.

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- I** None reported

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- S** Patient combative during extrication

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- T** Immobilized on long spine board; C collar; bag valve mask ventilation



## Discussion Questions:

1. What aspects of the reported mechanism of injury present a risk of airway compromise?
2. Which clinical findings suggest(s) potential airway compromise?

### Case Details

**M** 43-year-old obese- restrained driver lost control of his small vehicle while traveling at high speed on an icy road; crashed driver's side into a large tree.

**I** None reported

**S** Patient combative during extrication

**T** Immobilized on long spine board; C collar; bag valve mask ventilation

# TRAUMA PATIENT POPULATIONS CHANGES



**GERIATRIC**

**GROUND LEVEL FALLS**

**INTERFACILITY TRANSFERS**

**CLOSEST AVAILABLE LEVEL ONE IF WITHIN 60 MINUTES**

**RESPECT OF HOSPITAL CAPABILITY AND CAPACITY**

**REGIONALIZATION**

**ACCOUNTABILITY**

# QUESTIONS / COMMENTS



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