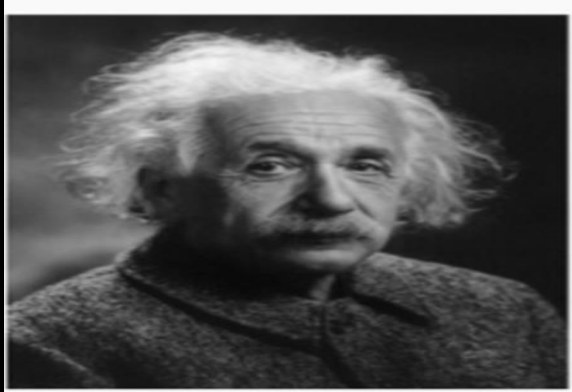


Trauma emergencies

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Assistant Professor of General Surgery
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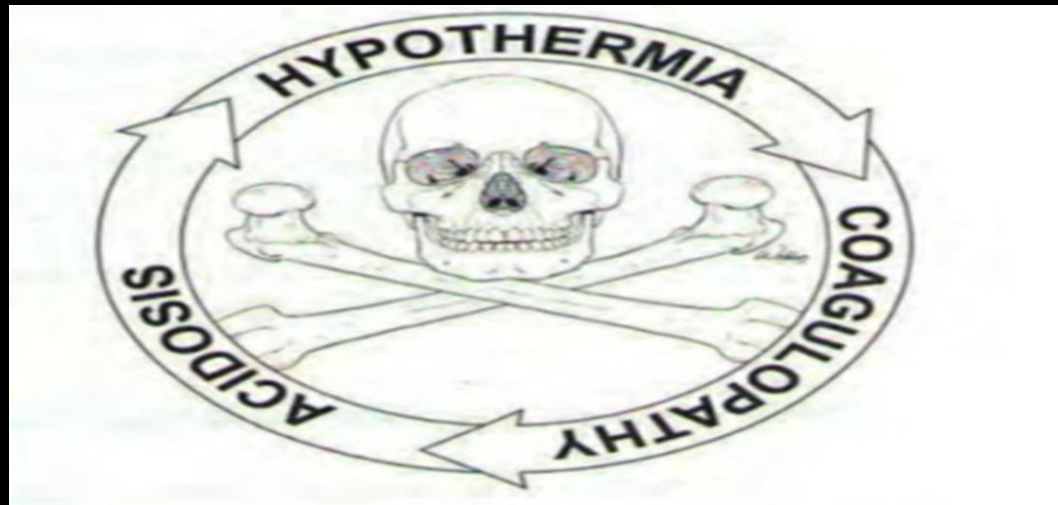
Why do we need to approach trauma patients differently?



“If you are looking for different results,
do not always do the same ”

Albert Einstein

1. Interaction of trauma on patient physiology (lethal triad)



2. The interval between the occurrence of the accident and the time of performing the appropriate medical treatment



3. Limitation of information regarding :

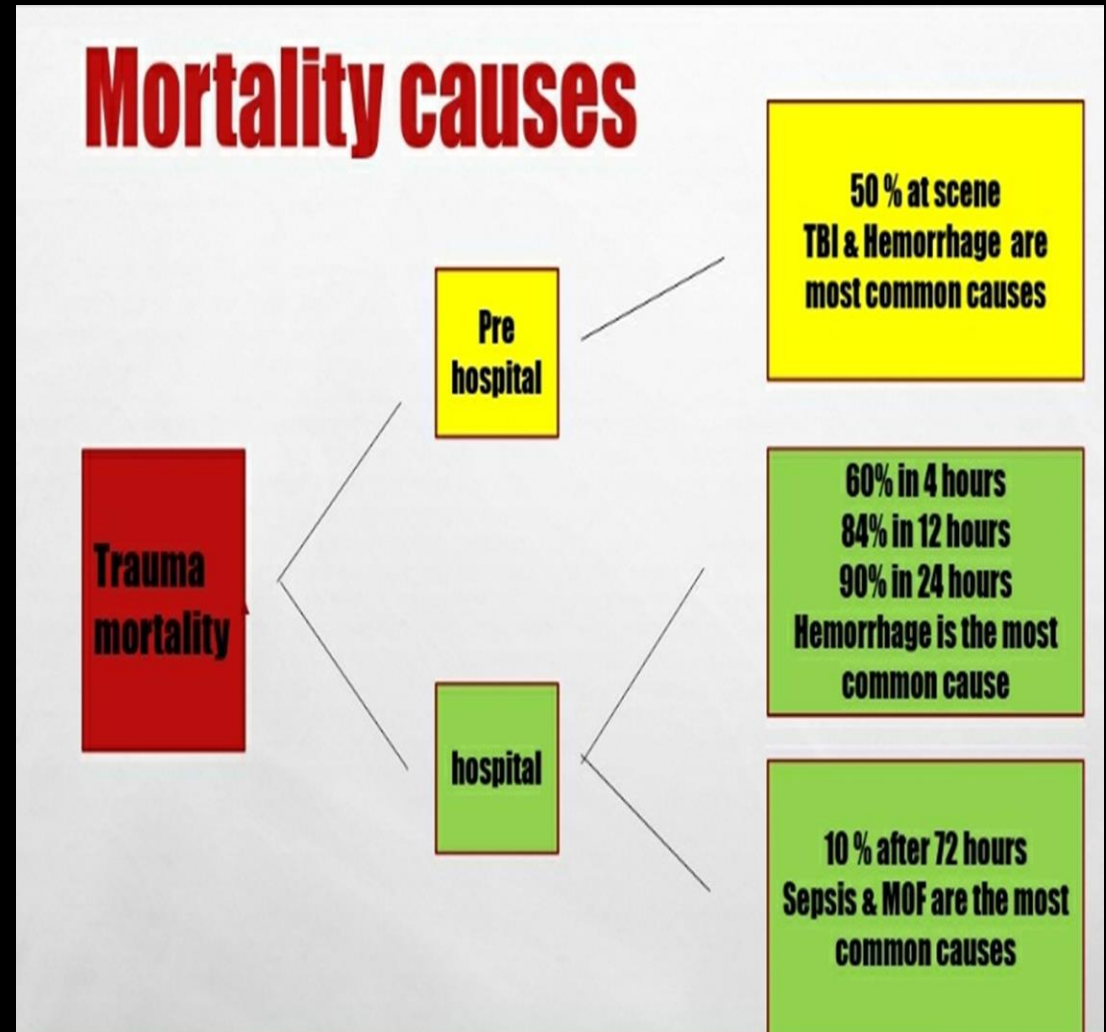
- . Underlying diseases
- . Injuries caused by recent trauma
- . Necessary preparations for treatment of recent injuries



Mortality causes in trauma patients

A. Mortality causes based on time of injury :

1. Acute phase (first 24 hours) : brain injuries and hemorrhagic shock
2. Subacute phase (24 to 72 hours after injury) : development of brain damage , hemodynamic changes due to re_bleeding or inadequate resuscitation , acute pulmonary complications
3. Chronic phase (after 72 hours) : infection and multi organ failure



Key points

- 1.trauma is a dynamic process
- 2 . Interpreting of alarming sings based on the time of occurrence

Principles of treatment based on the priority of life-threatening injuries (Advanced Trauma Life Support)



EMERGENCY TRAUMA ASSESSMENT

A
B
C
D
E
F
G
H
I

- Airway
- Breathing
- Circulation
- Disability
- Examine
- Fahrenheit
- Get Vitals
- Head-To-Toe Assessment
- Intervention



What should be considered in dealing appropriately with trauma patients?

1. Prevent the occurrence of the lethal triad by :

A .Prevention and control of the source of bleeding



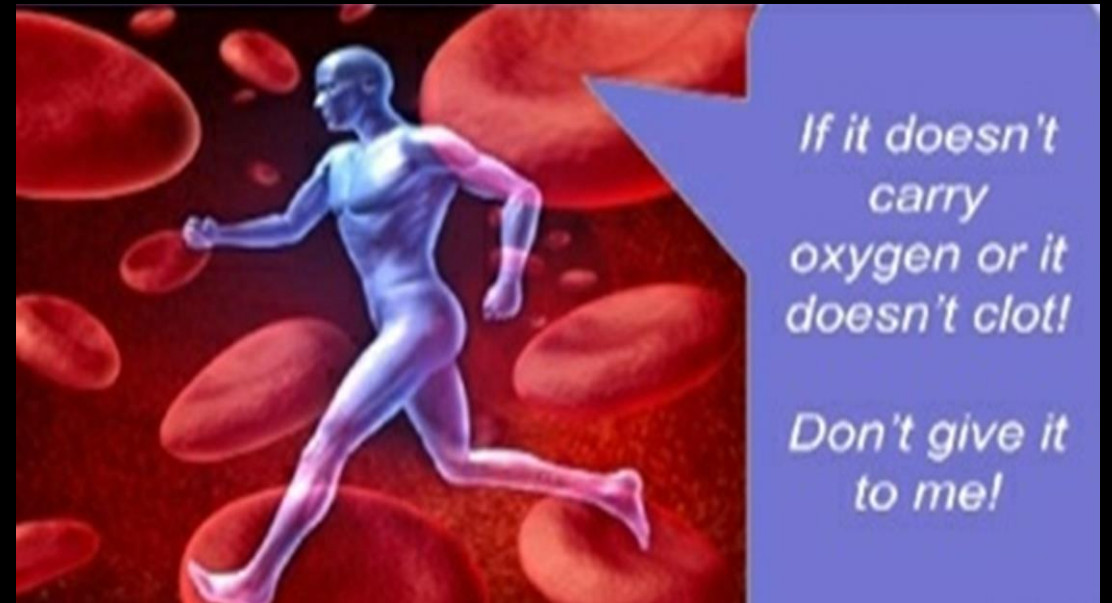
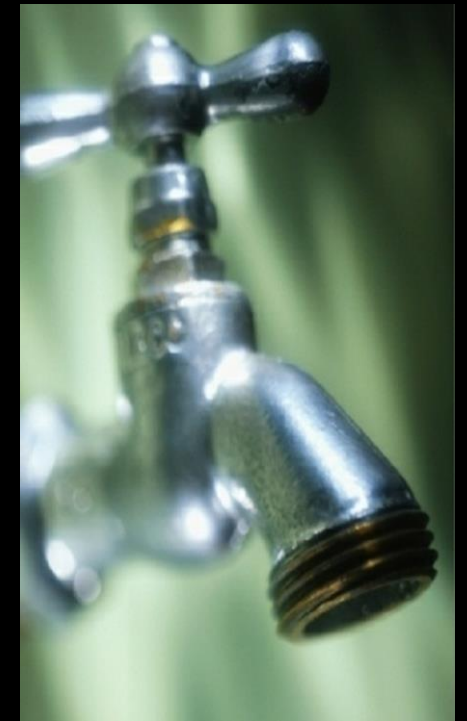
B . Proper resuscitation to maintain end organ perfusion

C . Prevention of bleeding or adverse effects following resuscitation or diagnostic procedures or treatments

D . Considering the importance of time in treatment to prevent physiological disorders

E . Use of product to increase delivery of oxygen to the tissue

F . Use of product which increase homeostasis at the site of bleeding



2 . Time management by :

A . Recognition of critically ill patients by EMS and faster transfer of patients to trauma centers

B . Systematic approach based on priority of life-threatening injuries for faster identification and time of treatment

C . Evaluation methods with appropriate diagnostic sensitivity and short time to perform it



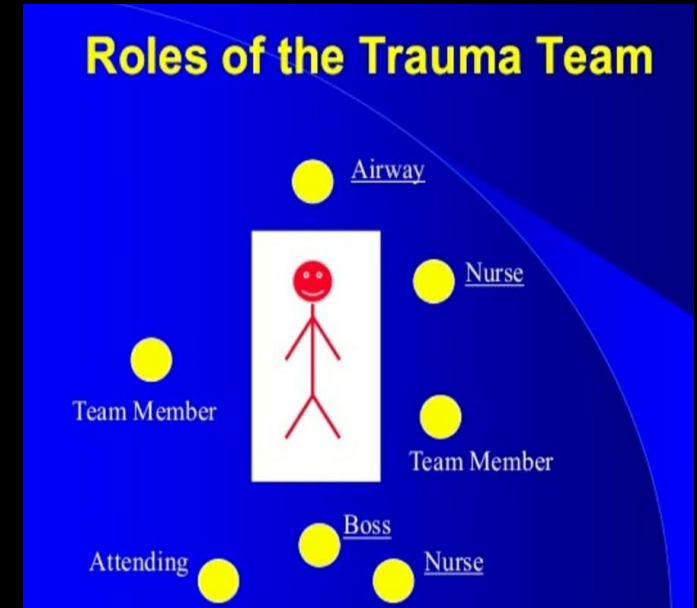
D . Presence of diagnostic equipment in the emergency room unit and non-invasive intervention and diagnostic equipment in the operating room



E . Team work

TEAM WORK

*“Joining Together is Beginning
Staying Together is Progress
Working Together is Success”*



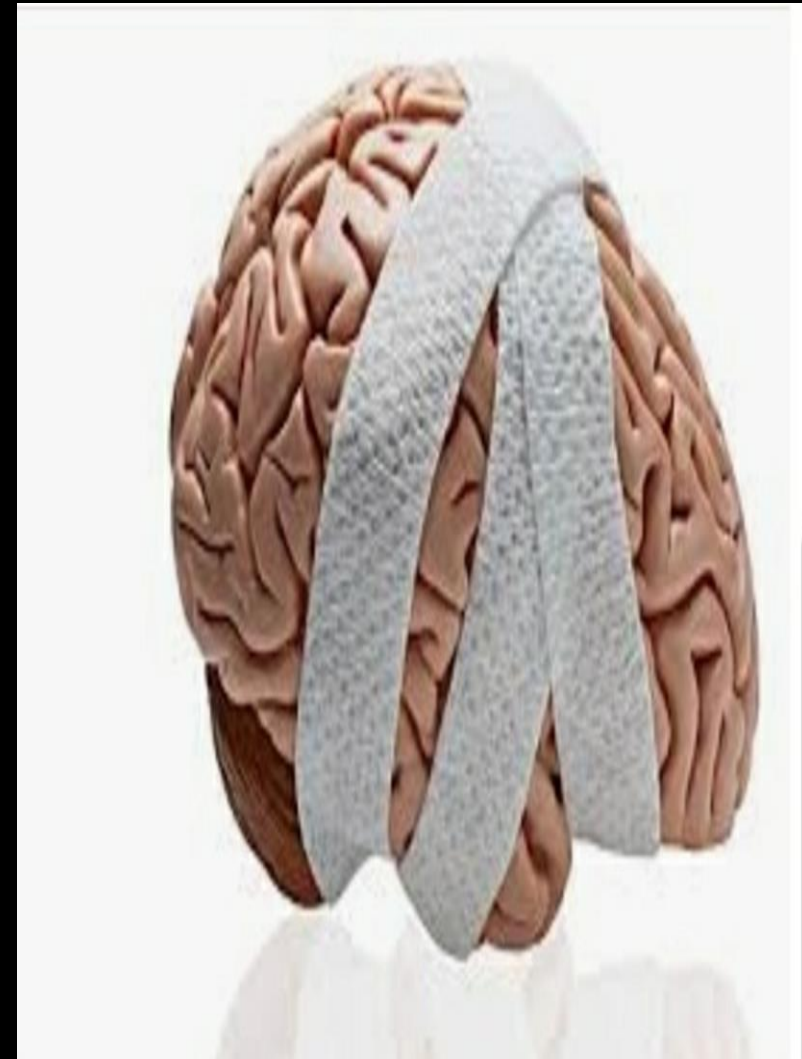
B . Necessary items to reduce mortality based on the prevalence of causes

1 . Nervous system injuries

a . Evaluation for presence of injuries

b . Appropriate resuscitation with the aim of maintaining brain perfusion to prevent secondary complications and worsening of the prognosis

c . Caution about possible spinal cord injuries



2 . Bleeding

a . Temporary source control of external bleeding



b . Limiting the amount of bleeding from possible sources



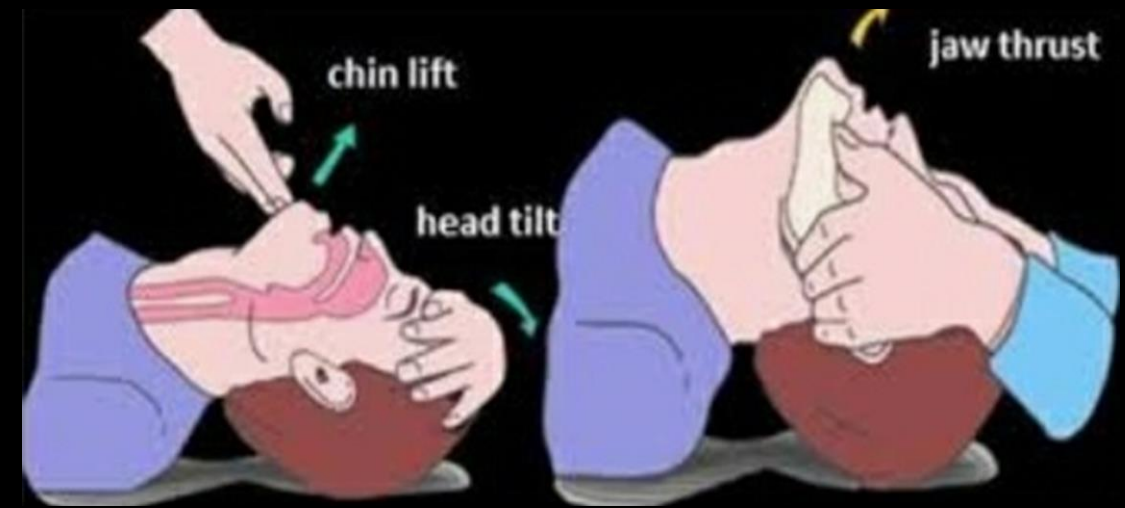
c . Proper resuscitation



Stop bleeding
Hypotensive resuscitation
Minimize crystalloid
Use plasma to resuscitate patients
Increased platelet use
Reverse hypothermia and acidosis
Hemostatic adjuncts

Airway – Establish patent airway with c-spine protection

- Clear the airway using wide bore suction
- Chin lift / Jaw thrust manoeuvre
- Oropharyngeal / nasopharyngeal airway
- Definitive airway
(Cuffed, Secured endotracheal tube)
- Surgical airway



Quick Assessment

What is a quick, simple way to assess a patient in 10 seconds?

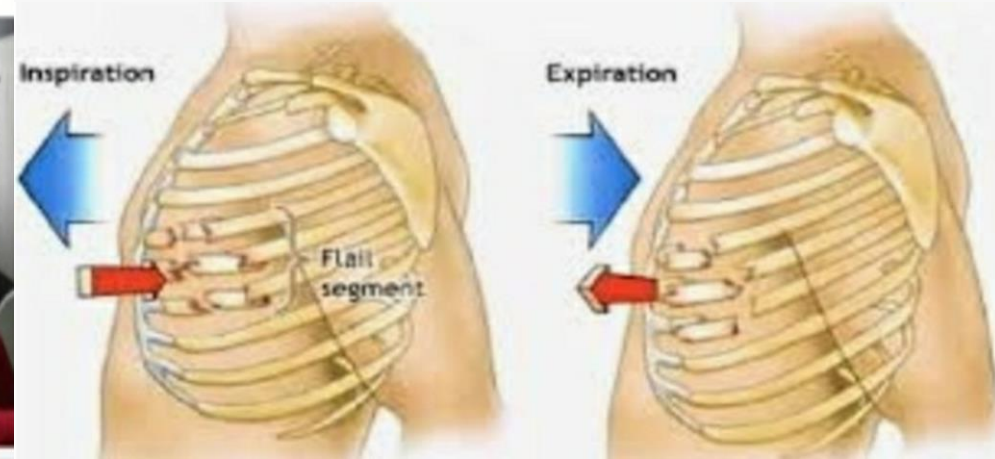
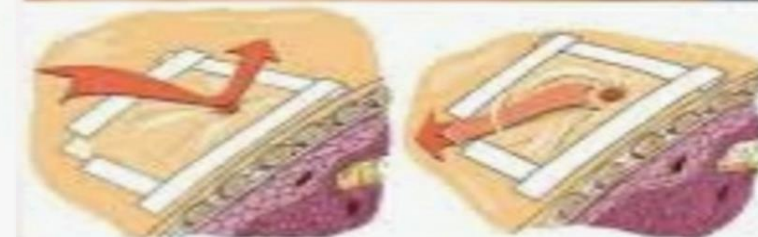
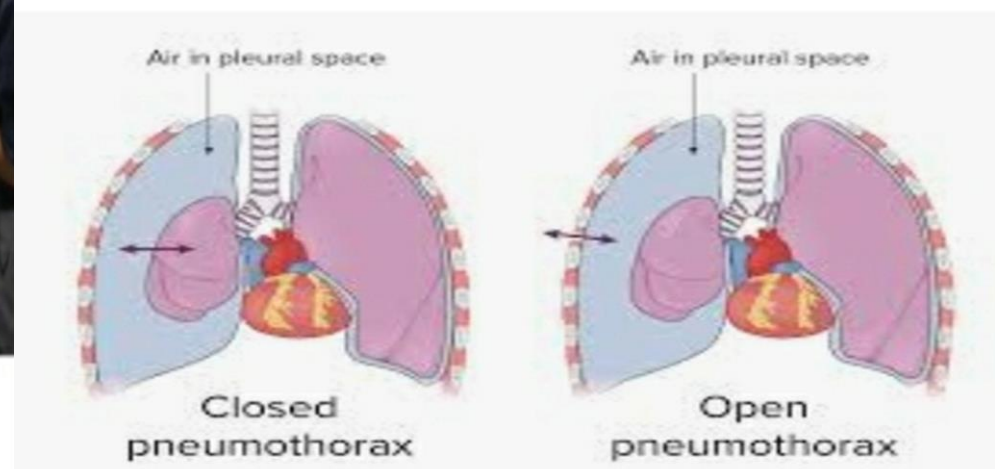
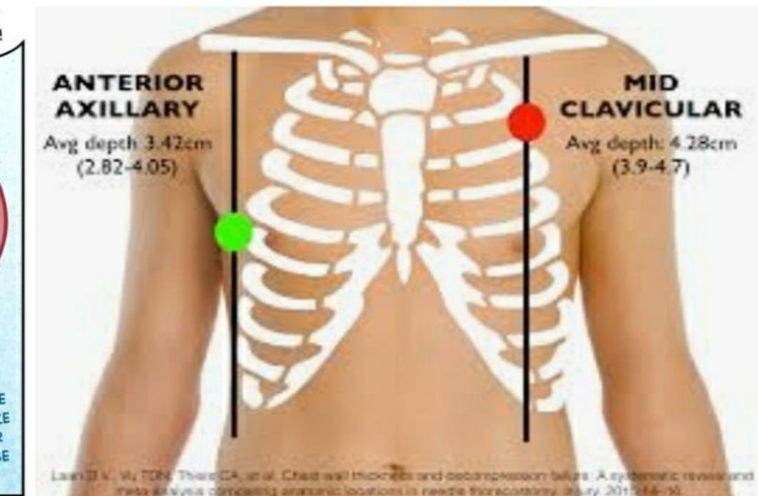
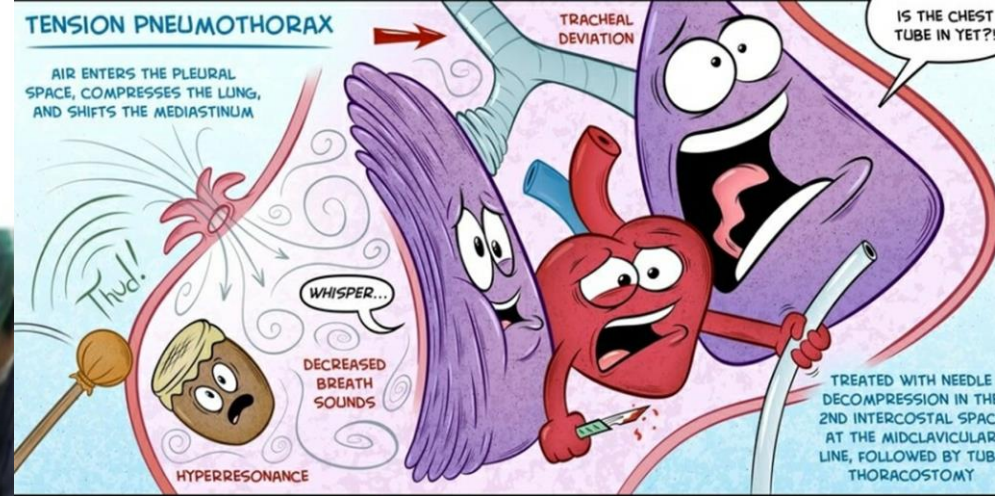
- Ask the patient his or her name?
- Ask the patient what happened?



Breathing and Ventilation

Assess

- Jugular venous distension
- Position of trachea
- Respiratory rate
- Percussion findings of chest
- Air entry
- Oxygen saturation



Primary Survey

Always consider physiological variations in special populations

- Elderly
- Infants and Children
- Pregnant Women
- Obese
- Athletes



The priorities are same for all the patients

Alarming signs

- Airways and breathing :
- Breathing rate
- Color changes
- Nose flaring
- Sweating
- Wheezing
- Body position

C. Shock assessment

Monitoring method	Indicators of hypoperfusion
Physical examination	<ul style="list-style-type: none">• Cool, clammy skin• Change in mental status (anxiety, confusion, lethargy, obtundation, coma)• Decreased urine output• Prolonged capillary refill
Vital signs	<ul style="list-style-type: none">• May be normal initially• Tachycardia, bradycardia• Hypotension• Tachypnea• Hypothermia• Shock index (heart rate/systolic blood pressure) > 0.9
Metabolic markers	<ul style="list-style-type: none">• Metabolic acidosis• Increased lactate• Increased base deficit

SHOCK INDEX

- Ratio of heart rate to SBP
- **Shock Index = HR/SBP**
- Help identify hypoperfused patients with more subtle vital sign abnormalities.
- A shock index of >0.9 has been found to be more sensitive than traditional vital sign

MEAN ARTERIAL PRESSURE (MAP)

- Mean arterial pressure (MAP) is a better representation than SBP for organ perfusion status
- **MAP = Diastolic BP + 1/3(Systolic BP – Diastolic BP).**
- **MAP = 1/3(Systolic BP) + 2/3(Diastolic BP)**
- Using MAP avoids the deception of a seemingly normal systolic blood pressure.
 - A patient with a BP of 80/60 (MAP=66) is actually perfusing their organs better than a patient with a BP of 110/30 (MAP=56).

1. Control of external bleeding

2. Peripheral or central venues access



Small extensions will inhibit flow.

Large bore extensions are less problematic.

Add the dual lumen extension to the line to increase flow.

Optional: Remove needless adaptors to increase flow (decreased resistance)

3. Initiate blood products as soon as possible and assess the need for MTP activation

7 Ts of MASSIVE HEMORRHAGE PROTOCOLS



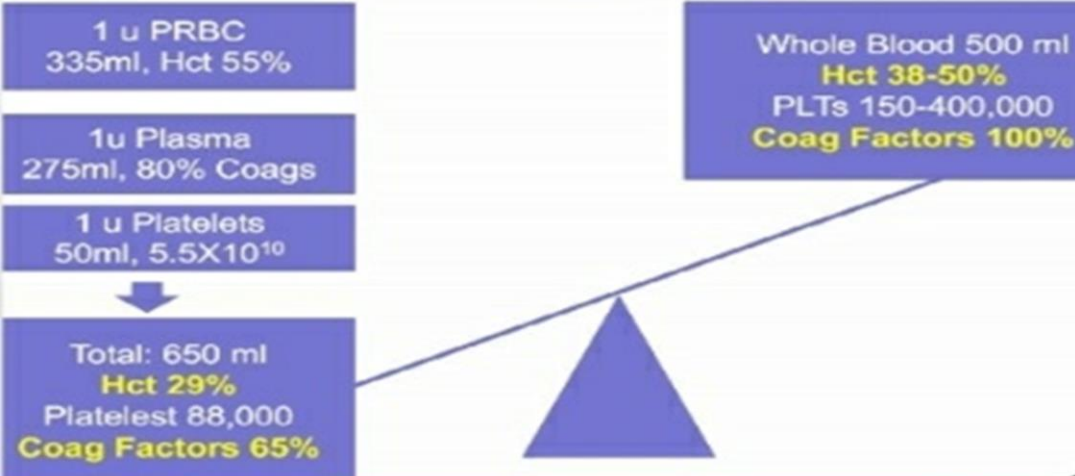
TRIGGERS
TEAM
TESTING
TXA
TEMPERATURE
TARGETS
TERMINATION



ABC SCORE

SCORE < 2 SUGGESTS UNLIKELY NEED FOR MASSIVE TRANSFUSION

SBP ≤ 90	+1
HR ≥ 120	+1
+ FAST	+1
PENETRATING TORSO INJURY	+1



1 u PRBC
335ml, Hct 55%

1u Plasma
275ml, 80% Coags

1 u Platelets
50ml, 5.5×10^{10}

Total: 650 ml
Hct 29%
Platelet 88,000
Coag Factors 65%

Whole Blood 500 ml
Hct 38-50%
PLTs 150-400,000
Coag Factors 100%

4. Investigate potential sources of bleeding, decide to control bleeding site

Assessment of blood loss

External or obvious

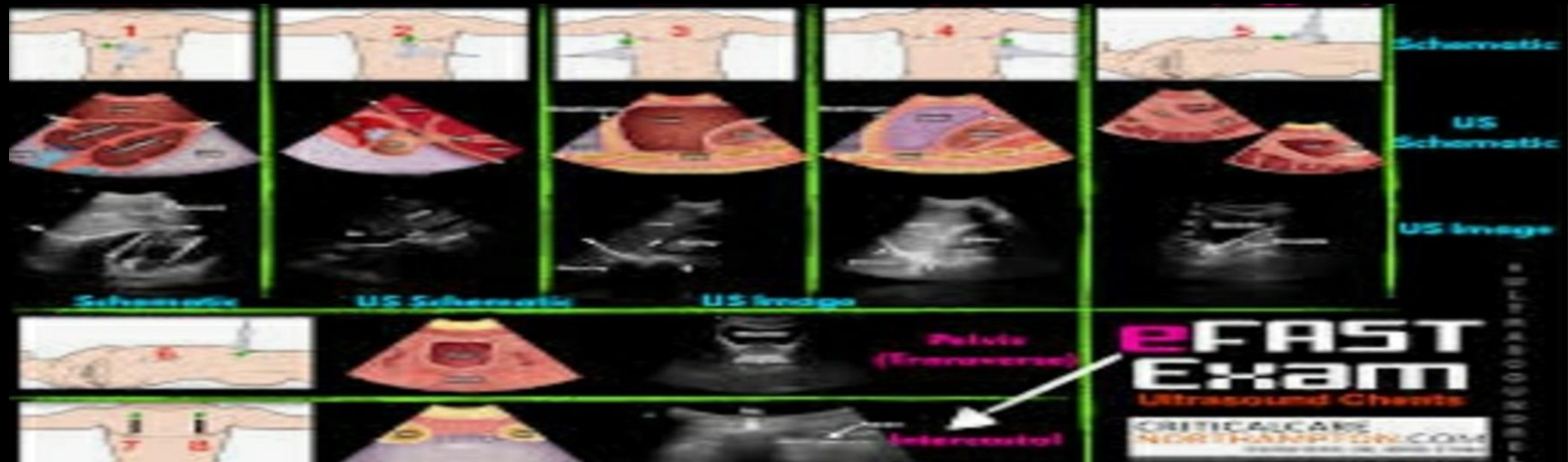
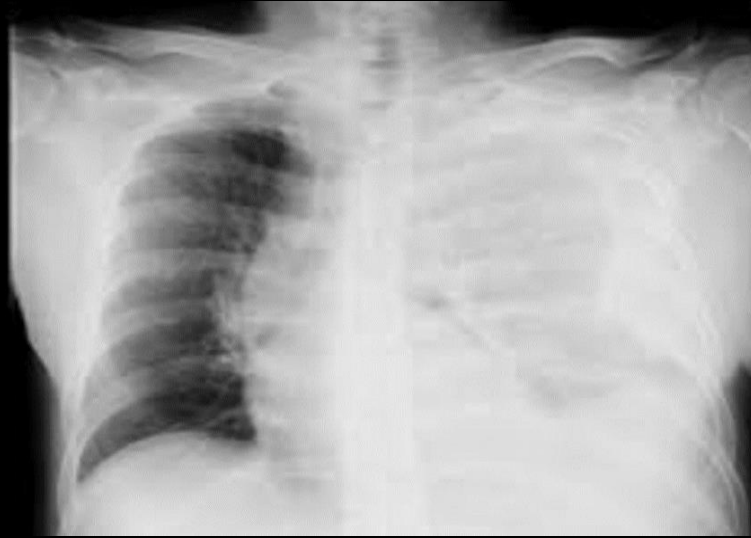
Internal or covert

chest

abdomen

pelvis

limbs



Schematic

US Schematic

US Image

Pelvis (Erect/Inverted)

Intercostal

eFAST Exam
Ultrasound Charts
CRITICALCARE
NORTHFLORIDA.COM
www.criticalcare.com

D. Neurological examination

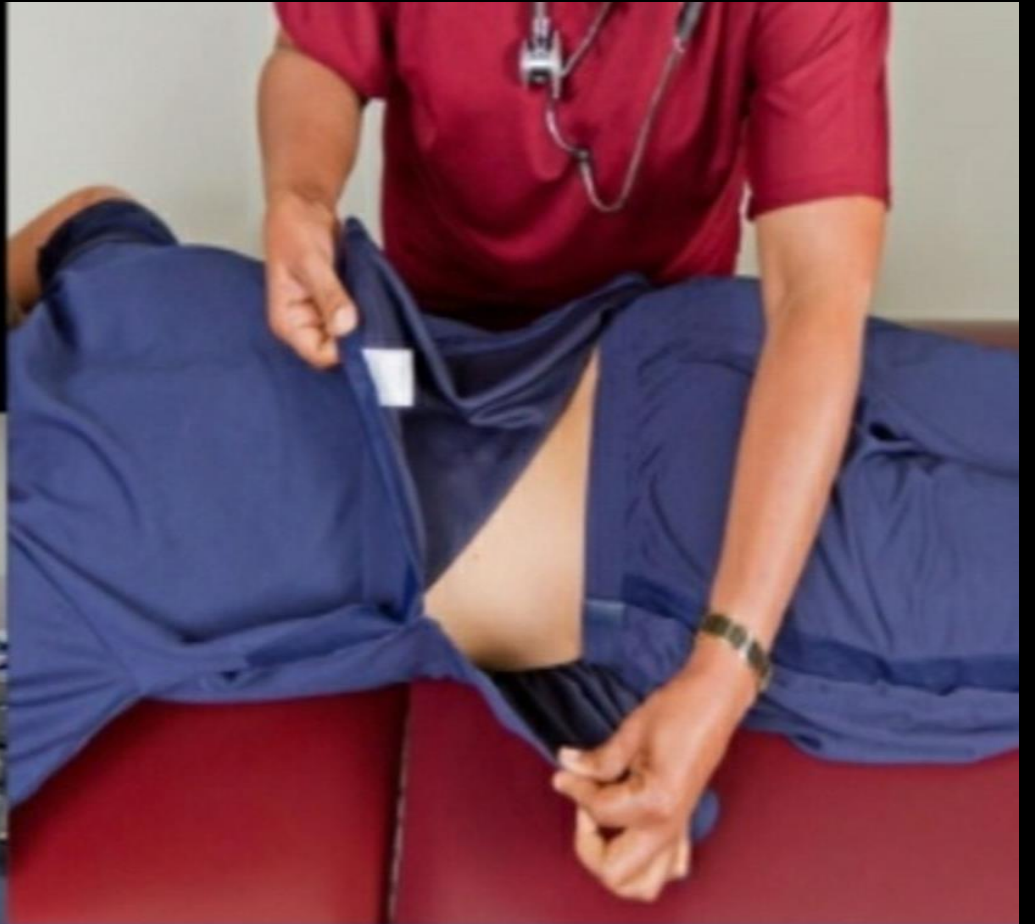
- Determine Glasgow coma scale
- Check pupil for (equality-reactivity)
- Signs of lateralization
- Neurological assessment

ATLS-PRIMARY SURVEY **Disability → Neurological Status**

- AVPU → Describes Patient's Level of Consciousness
- A → Alert
- V → Responds to vocal stimuli
- P → Responds to painful stimuli
- U → Unresponsive
- GCS to be done in secondary survey

E. Exposed the patient for complete examination with attention to prevent hypothermia

- Remove clothes
- Log roll
- Prevent hypothermia



Hypothermia can be present when the patient arrives, or it may develop quickly in the ED if the patient is uncovered and undergoes rapid administration of room-temperature fluids or refrigerated blood.

Because hypothermia is a potentially lethal complication in injured patients, take aggressive measures to prevent the loss of body heat and restore body temperature to normal

- **Keeping pt warm**
 - Warm blood products
 - Bair hugger type devices
 - Warm operating room

PITFALL

Hypothermia can be present on admission.

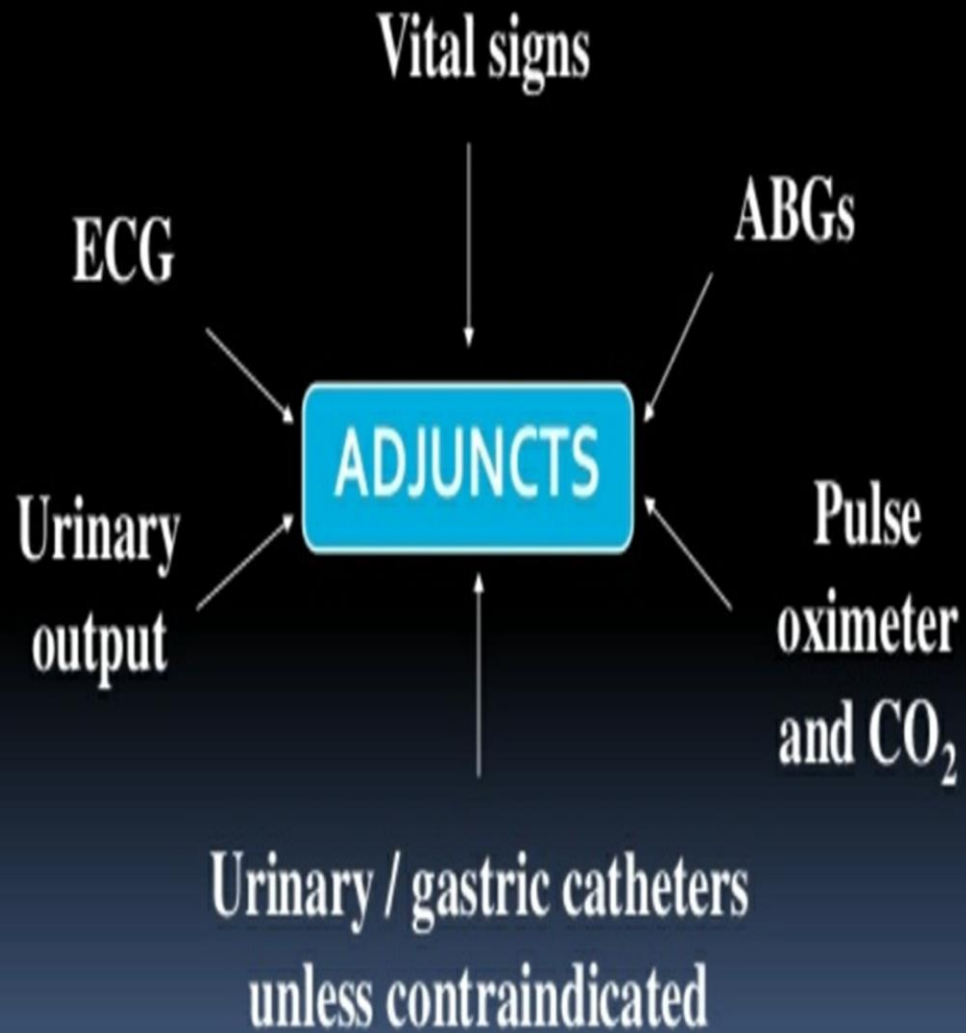
Hypothermia may develop after admission.

PREVENTION

- Ensure a warm environment.
- Use warm blankets.
- Warm fluids before administering.

- Control hemorrhage rapidly.
- Warm fluids before administering.
- Ensure a warm environment.
- Use warm blankets.





Reevaluation

- Minimizing missed injuries
 - high index of suspicion
 - frequent reevaluation and continuous monitoring

Reassess again

Repeat the primary survey frequently to identify any deterioration in the patient's status that indicates the need for additional intervention.

2. Secondary survey: evaluation for incident of injuries which potentially life treating

A . Complete history and physical examinations

- **A** → Allergies
- **M** → Medications Currently Taken
- **P** → Past Illness
- **L** → Last Meal
- **E** → Events/ Environment related to injury

B . Complete imaging and laboratory evaluation

Secondary Survey

The secondary survey does not begin until the primary survey (ABCDE) is completed, resuscitative efforts are under way, and improvement of the patient's vital functions has been demonstrated

ADJUCANTS

diagnostic tests may be performed during the secondary survey to identify specific

x-ray examinations of the spine and extremities

CT scans of the head, chest, abdomen, and spine

contrast urography and angiography

transesophageal ultrasound;

bronchoscopy

esophagoscopy; and other diagnostic procedures

Definitive care

- Whenever the patient's treatment needs exceed the capability of the receiving institution, transfer is considered.
- This decision requires a detailed assessment of the patient's injuries and knowledge of the capabilities of the institution, including equipment, resources, and personnel.

1. Responder group

- A . Continue resuscitation
- B . Frequent assessment
- C . Complete secondary survey
- D .Access need for source control or indication for non operative management of injuries

2. Non responder group

- A . Evidence of bleeding
source control of bleeding by surgery or intervention methods
- B . No evidence of bleeding
 - a . diagnosis of the underlying cause of shock
 - b . appropriate treatment based on cause of shock





*The future belongs
to those who believe
in the beauty
of their dreams.*

--Eleanor Roosevelt

THANK YOU