University of Basrah
Al-Zahraa College of Medicine

Ministry of higher Education and Scientific Research

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Approach to patients with multiple traumas in Orthopedics

Assist. Prof. Dr.Falih Waheed Hashim Alhasani

References:
Apley & Solomon's System of Orthopaedics and Trauma 10th Edition
ATLS -2018
Bailey's and Love's Short Practice of Surgery 28th Edition 2023

Learning Objectives:

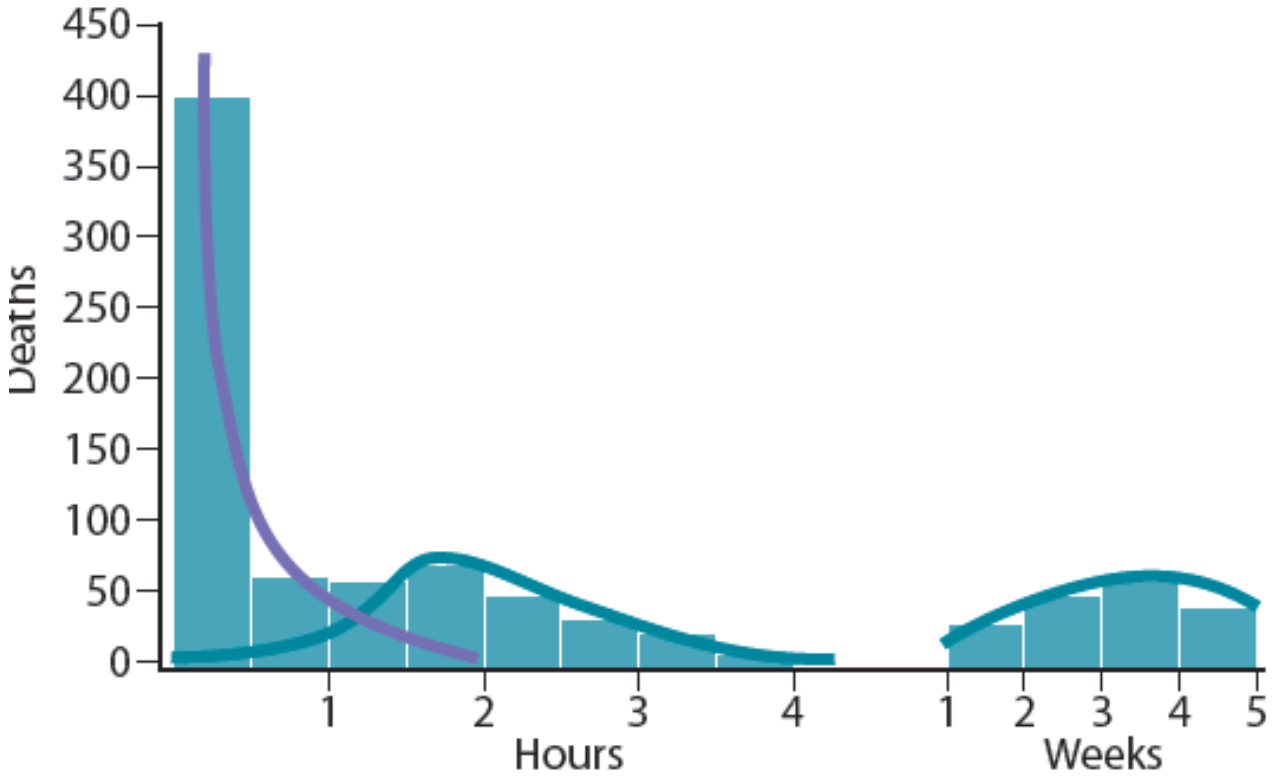
- To understand the concept of the ‘golden hour’ in the poly trauma patient and its relation to mortality and morbidity
- To understand that the history and physical examination are initially directed at identifying life-threatening conditions
- To be able how to apply the principles of the primary and secondary surveys
- To overview the primary and definitive treatment of the multiple injured patients

Multiple injured patient

- Injuries to more than one body regions or organs.
- The most prevalent causes: RTA, FFH, and intentional violence.

- Every second counts, and all aspects of management are critical.
- The concepts of initial assessment and management are the most important and should begin in prehospital.

- Trauma is one of the major causes of Death.
- The mortality rate peak within 1 hour of the injury (50–60%):**‘golden hour’.**
- The rapid assessment and the institution of life-preserving measures have led to a decrease in the high mortality in the early post-injury period.



- Significant proportion of death can be avoided with an effective emergency medical service (EMS)
- EMS should be available at the scene of the injury and transfer the patient rapidly to hospital.

Safety for healthcare personnel:

The doctor caring for the trauma patient should be wearing the following items as standard precautions:

- Cap
- Gown
- Gloves
- Mask and goggles or face shield
- Shoe covers.

Survey:

- **Primary survey**

The history and physical examination should initially be directed at identifying life-threatening injuries

Followed by:

- **Secondary survey:** the aim is to detect and evaluate injuries that are still potentially life-threatening as well as occult injuries.

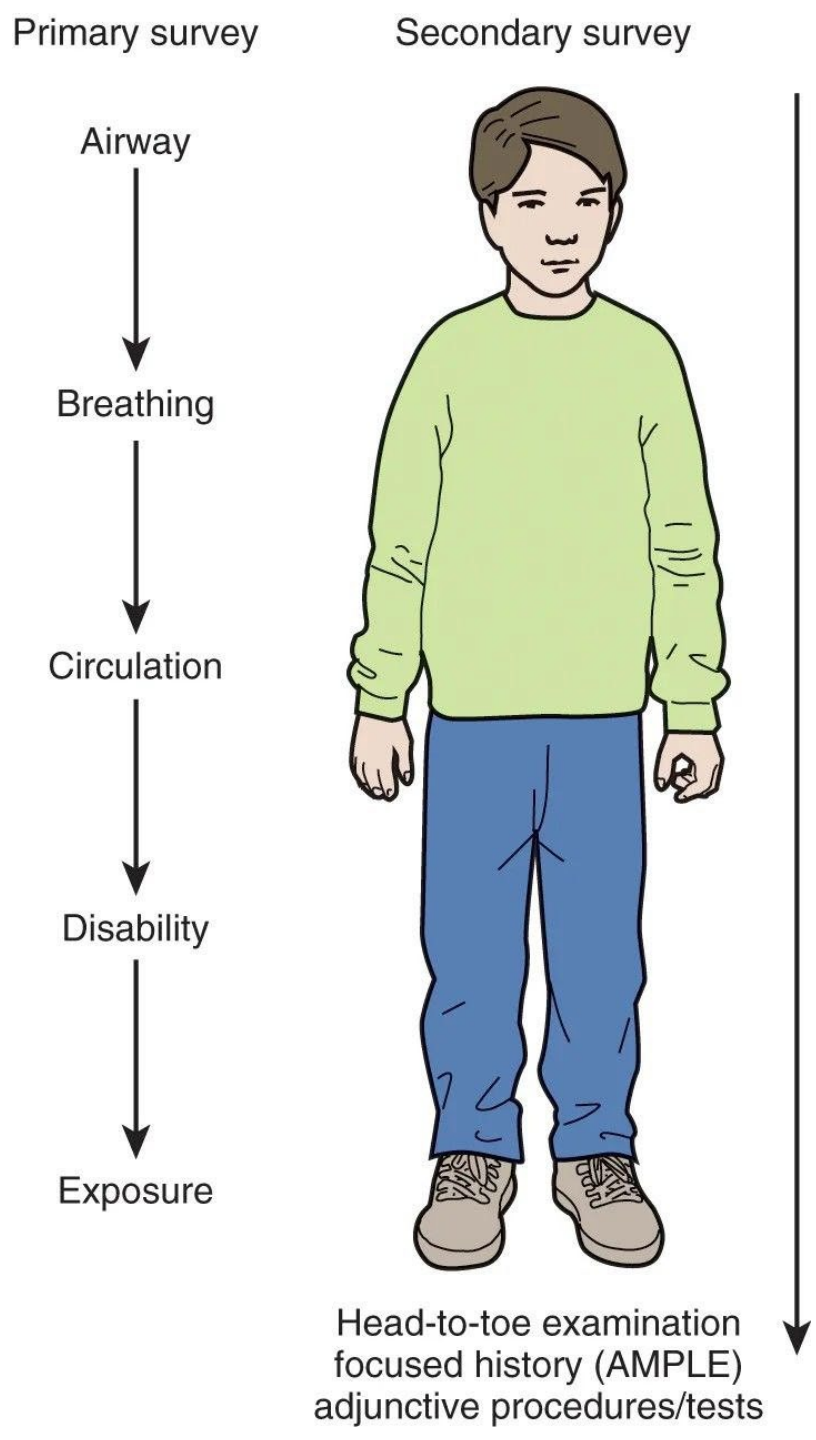
This systematic approach is the foundation for the Advanced Trauma Life Support.

THE PRIMARY SURVEY:

The sequence of steps follows the mnemonic ABCDE:

Airway–Breathing–Circulation–Disability–Exposure/Environment.

The specificity the history and physical examination should proceed simultaneously with the management of life threatening injuries during the resuscitation phase.



The life-threatening injuries that need to be identified during the primary survey:

	Injuries
Airway	Airway obstruction Airway injury Cervical spine injury
Breathing	Tension pneumothorax Open pneumothorax Flail chest and lung contusion
Circulation	Haemorrhagic shock Massive haemothorax Intra-abdominal bleeding Pelvic bleeding Bleeding from long bone fractures Bleeding from vascular injuries to the extremities Cardiac tamponade and cardiogenic shock Neurogenic shock
Disability	Intracranial haemorrhage

cABCDE

THE SECONDARY SURVEY:

It consists of

- Detailed history
- Thorough head to toe physical examination
- Complete neurological examination
- Special diagnostic tests and
- General re-evaluation.
- The purpose is to detect and manage potentially major as well as minor injuries.
- It is important to note that even major injuries can be missed: unconscious or attention given to a more obvious injuries.

THE SECONDARY SURVEY:

Commonly missed injuries:

- Chest trauma: the aorta and its branches, and esophagus
- Blunt abdominal trauma: the stomach, small bowel and pancreatoduodenum
- Penetrating abdominal trauma: colorectal and genitourinary.
- Trauma to the extremities: fractures, vascular injuries and compartment syndromes.

THE SECONDARY SURVEY: History

AMPLE:

- Allergies
- **M:** Medications (anticoagulants, insulin and cardiovascular medications)
- **P:** Previous medical and surgical history
- **L:** Last meal (time)
- **E:** Events/Environment surrounding the injury (exactly what happened).

THE SECONDARY SURVEY: Physical Examination

- **Head and Face**
- **Neck:** All patients undergo major trauma should be assumed to have cervical spine injury.

#Cervical spine immobilization by neck collar should be initiated and maintained until an unstable cervical spinal injury is excluded

- **Chest**
- **Abdomen**

THE SECONDARY SURVEY: Physical Examination

- **Pelvis:** look for ecchymosis feel for tenderness along the pelvic ring that may dictate further imaging. Pelvic support is necessary in major trauma patients.
- Rectum and Genitourinary Tract

Pelvic binder

THE SECONDARY SURVEY: Physical Examination

- **Musculoskeletal System:**

Inspect and palpate for deformity, tenderness, decreased range of motion.

The neurovascular status should be assessed and documented.

Identify fractures early and splinted to reduce pain and ongoing blood loss.

THE SECONDARY SURVEY: Physical Examination

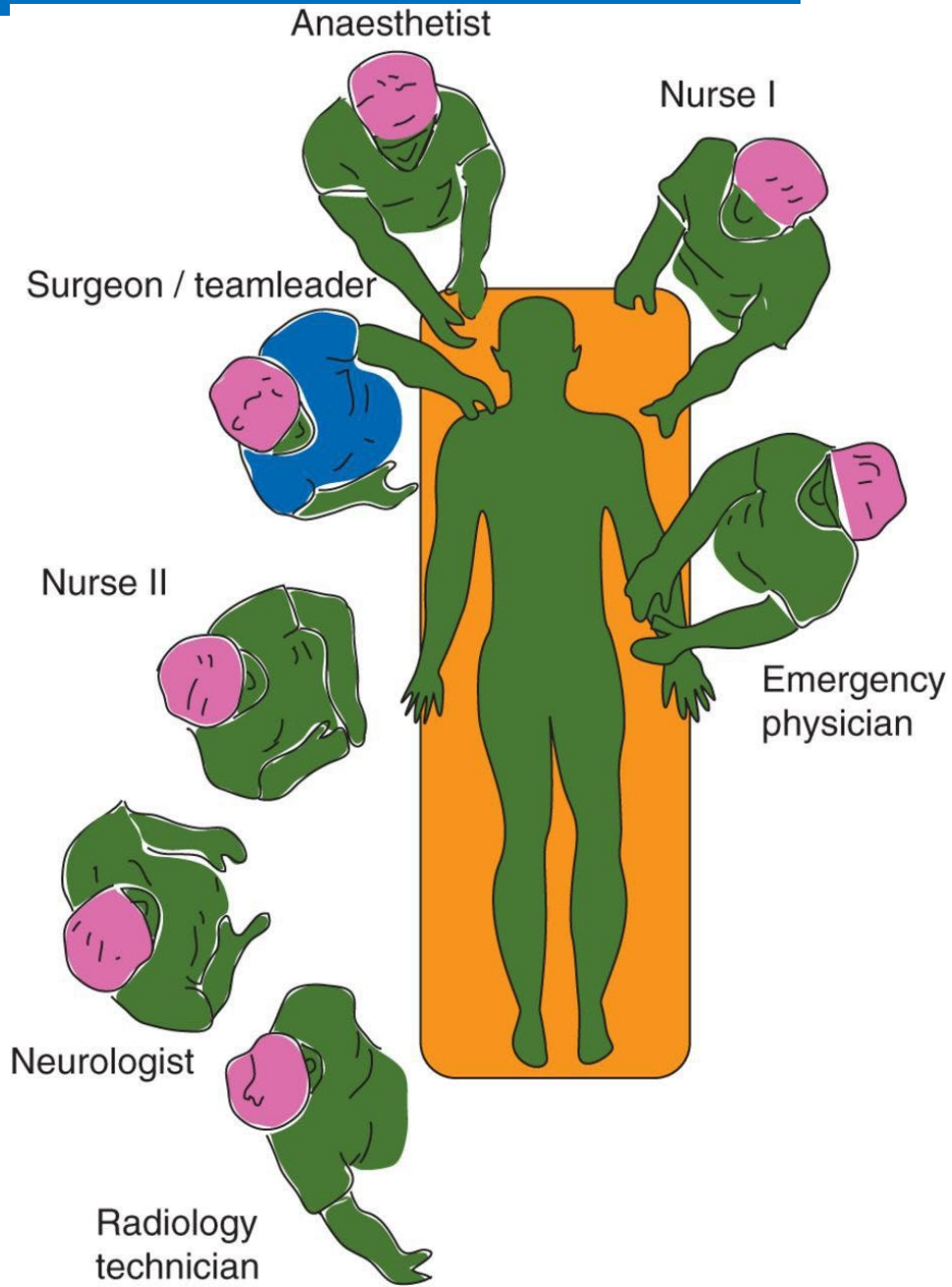
- **Neurological System:** serial examinations should be performed and compared with previous ones(GCS).
- **Skin**

Glasgow Coma Scale

BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	*Best response*	15
	Comatose client	8 or less
	Totally unresponsive	3

DEFINITIVE CARE

• Once the primary and secondary surveys have been completed, thought should be given to the next stage of care of the trauma patient.



DEFINITIVE CARE

• Patients respond well to resuscitation are suitable for early total care (ETC).

A number of physiological indices are used to evaluate the response to resuscitation:

- Pulse rate less than 100 per minute,
- Normal blood pressure
- Normal respiratory rate
- Urine output >30 mL/h.
- The patient should not have hypothermia (temperature <35°C)
- No evidence of acidosis on arterial blood gases.
- Normal coagulation screen.

DEFINITIVE CARE

• Venous lactate levels: a good indicator of tissue perfusion and should rapidly return to normal(<2 mmol/L): it is usually safe for the surgeon to proceed with definitive repair or reconstruction of injured organs.

In MSK injuries ETC: definitive fixation of all unstable long bone, spinal and pelvic fractures within 36 hours of injury: This facilitates nursing care, allows early mobilization of the patient and reduces pulmonary complications and length of stay on intensive care.

➢ Damage Control care (DCC)

ATLS: cABCDE

TABLE 29.1 Advanced Trauma Life Support principles of resuscitation.

C	Catastrophic haemorrhage
A	Airway
B	Breathing
C	Circulation
D	Disability (neurology)
E	Environment and exposure

c: Exsanguinating external haemorrhage from massive arterial bleeding needs to be controlled even before the airway is management.

- By the application of packs and pressure directly onto the bleeding wound and proximal artery.
- Failure to control bleeding in the limb followed by the application of a tourniquet proximal to the wound. It is vital to label the time and the patient requires urgent surgical control of the bleeding in order to reperfuse the limb.
- Angioembolisation

A: Airway with cervical spine control: All trauma patients should have their cervical spine immobilized and protected throughout, with immediate assessment of the patient's airway.

B: Breathing and ventilation:

All patients should receive high-flow oxygen. Life-threatening chest pathology as tension pneumothorax, massive haemothorax and flail chest should be diagnosed and managed immediately.

C: Circulation and haemorrhage control

All patients require adequate intravenous (IV) access with at least two large-bore IV cannulae

D: Disability

On admission, the GCS score should be calculated, and reassessed.

E: Exposure

The patient must be adequately exposed to allow a thorough and systematic clinical examination during but they must be kept warm

Traditionally: chest and pelvis radiographs are obtained early in the assessment of patients with polytrauma

PRIMARY SURVEY: Summary

The early assessment and management of trauma patients should follow established ATLS principles (cABCDE):

- c – Control of massive external haemorrhage
- A – Airway with cervical spine protection
- B – Breathing and ventilation
- C – Circulation and haemorrhage control: apply a pelvic binder and do not remove until a pelvic fracture is excluded
- D – Disability (neurological status)
- E – Exposure (assess for other injuries)
- A Whole body CT scan(WBCT) from the head to the pelvis, with IV contrast is the gold standard investigation for major trauma patients and should be performed early and whenever possible.

THANK YOU

Questions?