

ATLS

ATLS

- **A** **Advanced**
- **T** **Trauma**
- **L** **Life**
- **S** **Support**

ATLS

Preparation

1. Prehospital phase
2. Inhospital phase

Triage

1. Multiple casualties
2. Mass casualties

ATLS

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- Primary survey
- Resuscitation
-
- Secondary survey
-
-
- Definitive care

ATLS

- Preparation & Triage
- Primary survey
- Resuscitation
- Adjuncts to primary survey and resuscitation
- Secondary survey
- Adjuncts to secondary survey
- Post resuscitation monitoring and reevaluation
- Definitive care

ATLS

- Preparation & Triage
 - The use of the following protective devices is recommended
 - Goggles
 - Gloves
 - Fluid-impervious gowns or aprons
 - Shoe covers and fluid-impervious leggings
 - Mask
 - Head covering

ATLS

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ATLS

- Primary survey
 - **A** **A**irway maintenance with cervical spine protection
 - **B** **B**reathing and ventilation
 - **C** **C**irculation with hemorrhage control
 - **D** **D**isability : Neurological status
 - **E** **E**xposure/**E**nvironmental control : completely undress the patient, but prevent hypothermia

ATLS

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- Primary survey
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-
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-
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- Definitive care

ATLS

- Resuscitation
 - Oxygenation and ventilation
 - Shock management, intravenous lines, warmed Ringer's lactate solution
 - Management of life-threatening problems identified in the primary survey is continued

ATLS

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- Primary survey
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-
- Secondary survey
-
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- Definitive care

ATLS

- Adjuncts to primary survey and resuscitation
 - X-rays and diagnostic studies
 - Chest
 - Pelvis
 - C-spine
 - DPL or FAST
 - Urinary and gastric catheters
 - Monitoring
 - ABG analysis and ventilatory rate
 - End-tidal carbon dioxide
 - EKG
 - Pulse oximetry
 - Blood pressure

ATLS

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-
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Secondary survey

- Secondary survey does not begin until the primary survey (ABCDEs) is completed, resuscitative efforts are well established, and the patient is demonstrating normalization of vital functions.

Secondary survey

- Head-to-toe evaluation
- Complete history and physical examination
- Reassessment of all vital signs

ATLS

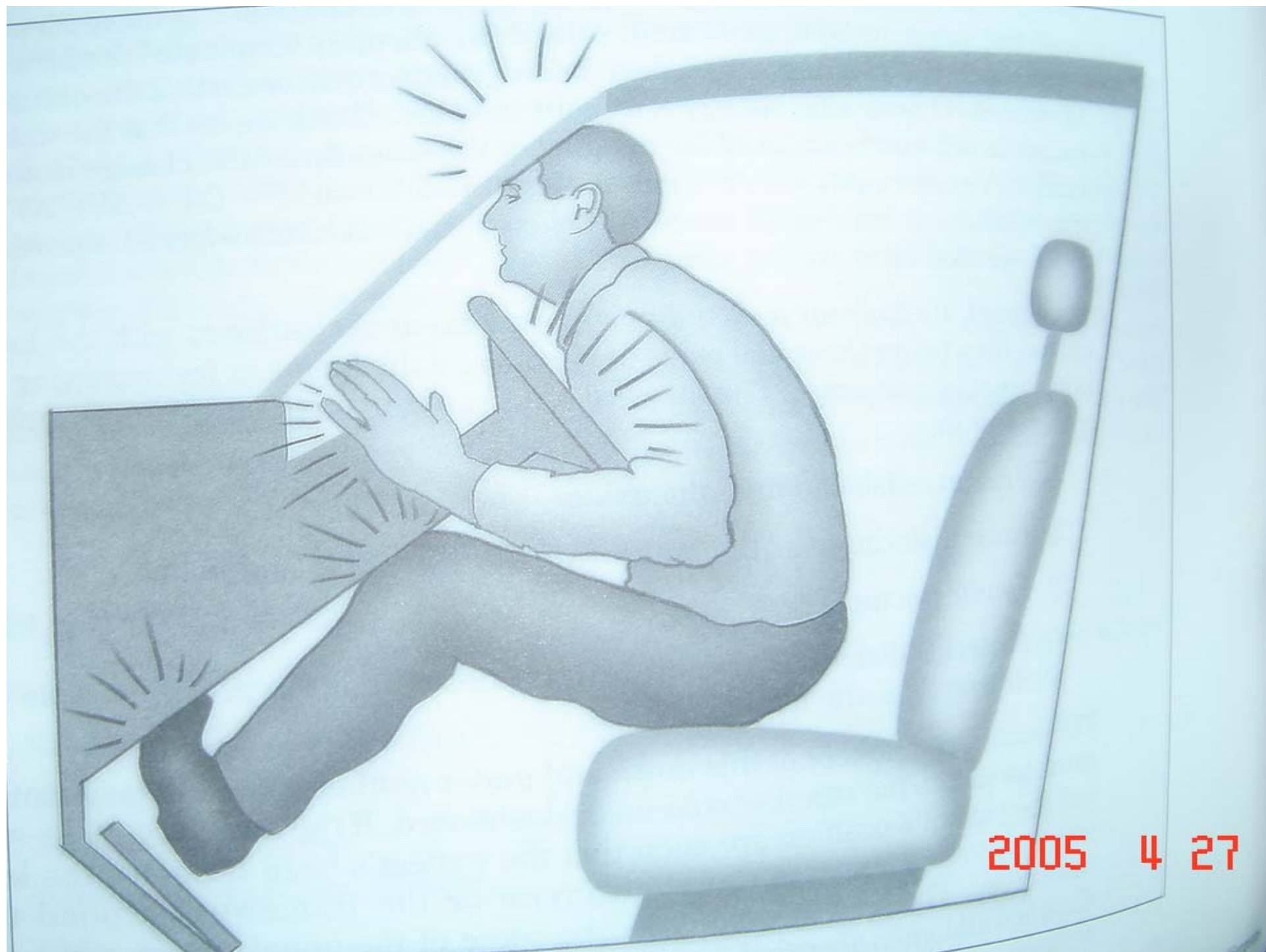
- Secondary survey
 - Total patient evaluation
 - history : AMPLE
 - physical examination
 - Complete neurologic examination
 - Head and skull
 - Maxillofacial
 - Neck
 - Chest
 - Abdomen
 - Perineum/rectum/vagina
 - Musculoskeletal
 - Tubes and fingers in every orifice

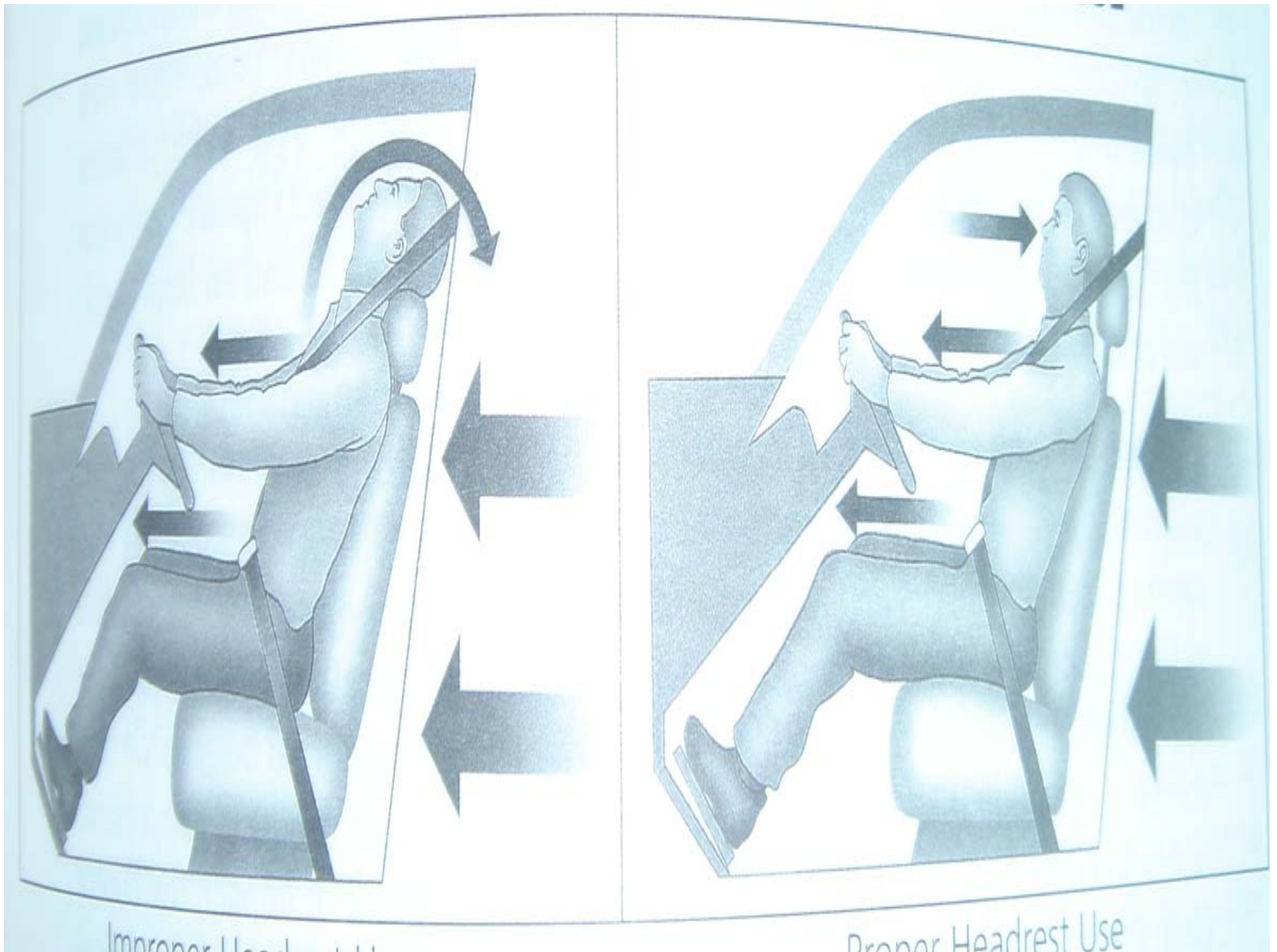
Secondary survey

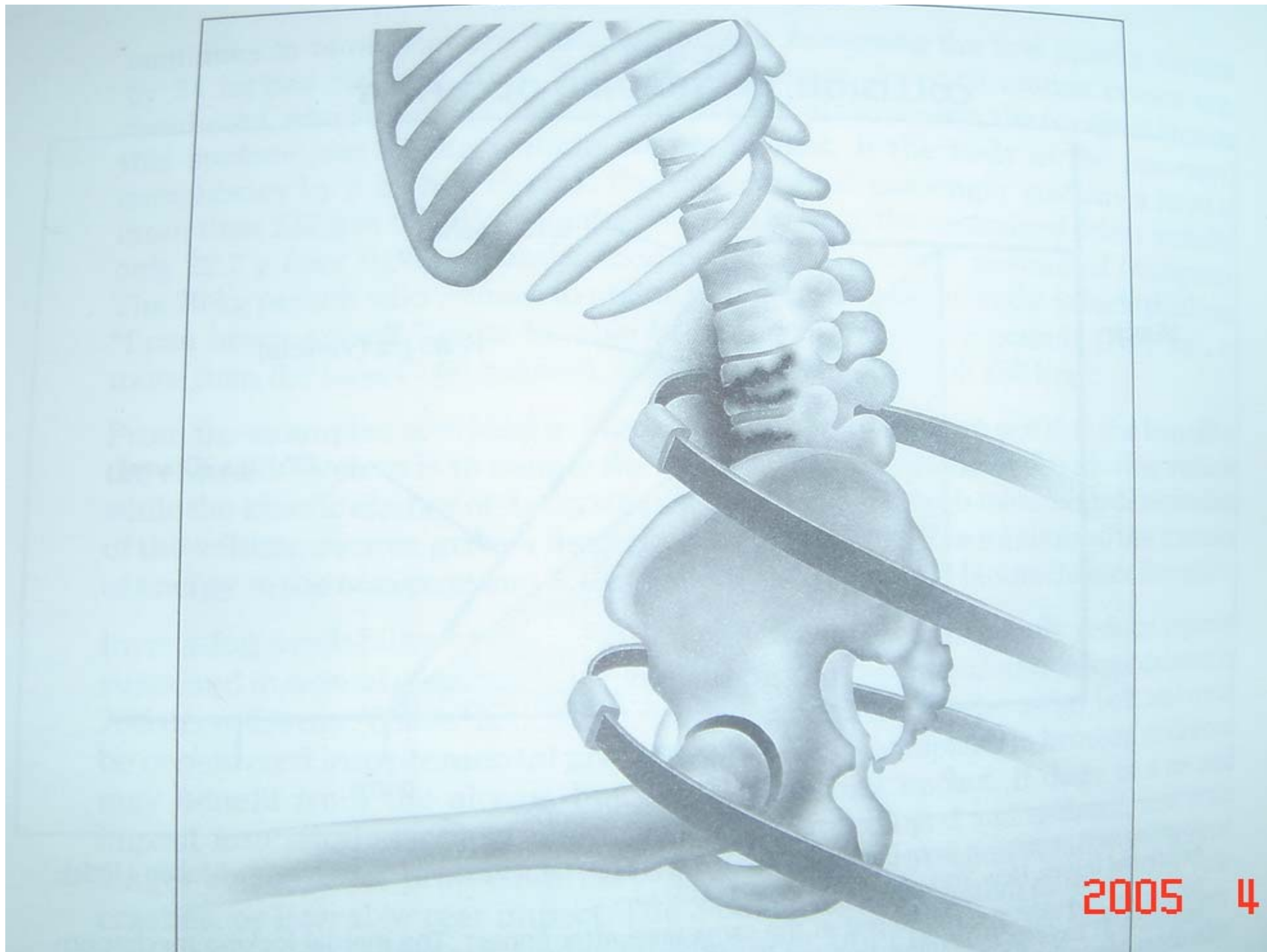
- History
 - **A** Allergies
 - **M** Medications currently used
 - **P** Past illnesses/**P**regnancy
 - **L** Last meal
 - **E** Events/**E**nvironment related to the injury

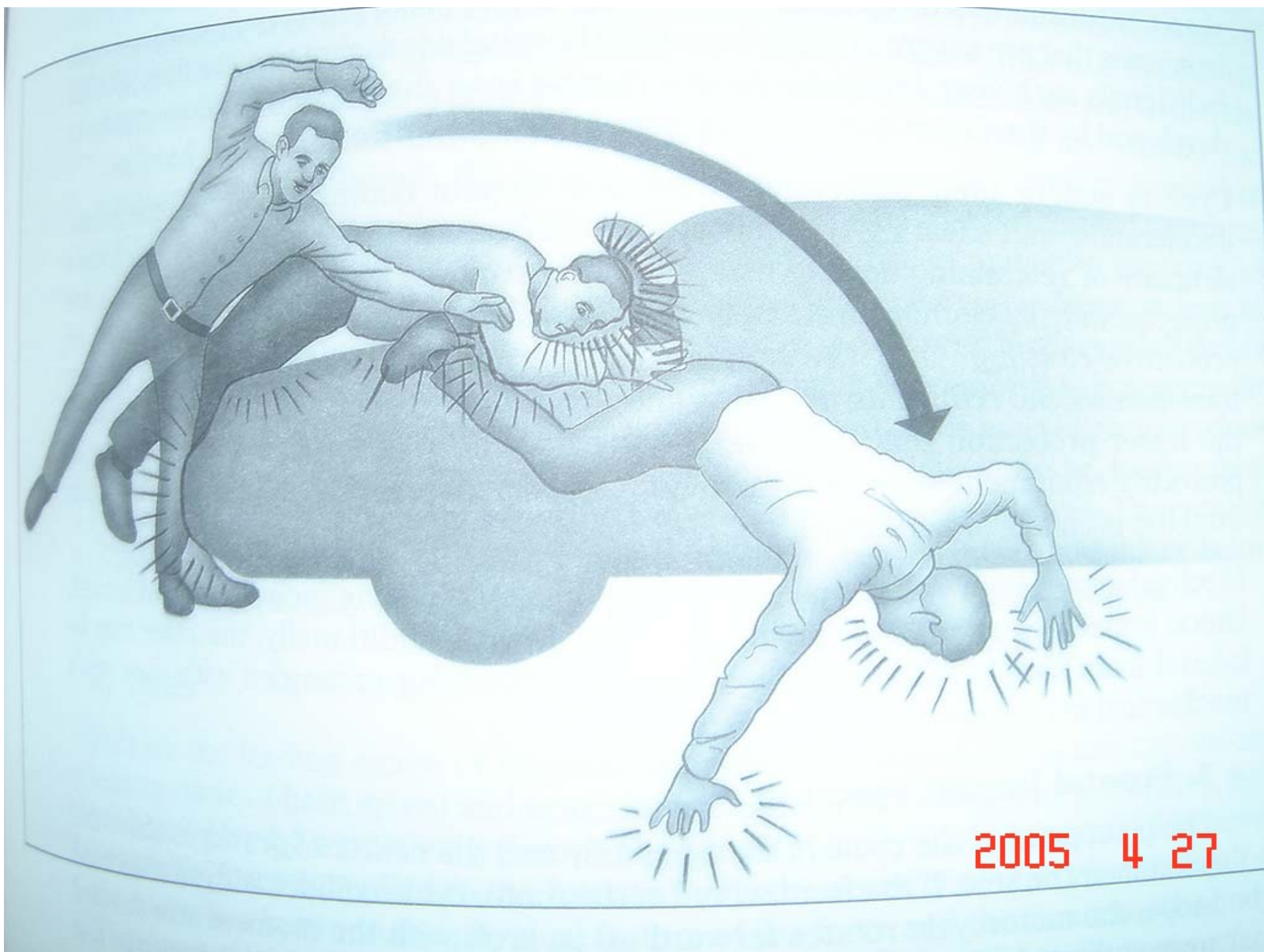
Secondary survey

- History
 - Blunt trauma
 - Penetrating trauma
 - Injuries due to burns and cold
 - Hazardous environment









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Secondary survey

- Physical examination
 - Neurologic
 - Head
 - Maxillofacial
 - Cervical spine and neck
 - Chest
 - Abdomen
 - Perineum/rectum/vagina
 - Musculoskeletal

Secondary survey

- Physical examination
 - Neurologic
 - level of consciousness
 - pupillary size and response
 - motor and sensory
 - GCS

Glasgow Coma Scale

- Eye opening (E)
 - Spontaneous 4
 - To speech 3
 - To pain 2
 - None 1
- Best motor response (M)
 - Obeys commands 6
 - Localizes pain 5
 - Normal flexion (withdrawal) 4
 - Abnormal flexion (decorticate) 3
 - Extension 2
 - None (flaccid) 1
- Verbal response (V)
 - Oriented 5
 - Confused conversation 4
 - Inappropriate words 3
 - Incomprehensible sounds 2
 - None 1

Secondary survey

- Physical examination
 - Head
 - Scalp
 - Fractures
 - Eyes edema
 - VA - Pupil size - Penetrating injury
 - Hemorrhage of conjunctivae, fundi
 - Contact lenses - Dislocation of lenses
 - Ocular entrapment

Secondary survey

- Physical examination
 - Maxillofacial
 - airway obstruction , major bleeding
 - Fx of mid maxilla beware of NG tube insertion
 - need frequent reassessment

Secondary survey

- Physical examination
 - Cervical spine and neck
 - Head injury pt. keep in mind of cervical spine injury
 - Absence of neurologic deficit does not exclude spine injury
 - Inspection , palpation , auscultation , cervical spine tenderness , subcutaneous emphysema , tracheal deviation , laryngeal fracture
 - Protection of C-spine injury , helmet removing

Secondary survey

- Physical examination
 - Chest
 - Visual evaluation of anterior and posterior chest
 - open pneumothorax
 - flail chest
 - Pain , dyspnea , hypoxia
 - Cardiac tamponade , tension pneumothorax
 - distended neck veins
 - distant heart sound

Secondary survey

- Physical examination
 - Abdomen
 - closed observation and frequent reevaluation
 - unexplained hypotension
 - neurologic injury
 - equivocal abdominal finding

Secondary survey

- Physical examination
 - Perineum/rectum/vagina
 - contusion , hematoma , laceration , urethral bleeding
 - rectal examination : blood , high-riding prostate , integrity of rectal wall , sphincter tone
 - female :
 - Vg exam.: blood , Vg laceration
 - pregnancy test

Secondary survey

- Physical examination
 - Musculoskeletal
 - inspection : contusion , deformity
 - palpation : tenderness , abnormal movement
 - pelvic Fx : ecchymosis on iliac wings , pubis , labia , scrotum , pain on palpation of pelvic ring , PCT
 - assessment of peripheral pulses
 - patient's back examination

**TABLE 1
SECONDARY SURVEY**

Item to Assess	Establishes/Identifies	Assess	Finding	Confirm By
Level of Consciousness	<ul style="list-style-type: none"> Severity of head injury 	<ul style="list-style-type: none"> GCS Score 	<ul style="list-style-type: none"> ≤8, severe head injury 9–12, moderate head injury 13–15, minor head injury 	<ul style="list-style-type: none"> CT scan Repeat without paralyzing agents
Pupils	<ul style="list-style-type: none"> Type of head injury Presence of eye injury 	<ul style="list-style-type: none"> Size Shape Reactivity 	<ul style="list-style-type: none"> Mass effect Diffuse axonal injury Ophthalmic injury 	<ul style="list-style-type: none"> CT scan
Head	<ul style="list-style-type: none"> Scalp injury Skull injury 	<ul style="list-style-type: none"> Inspect for lacerations and skull fractures Palpable defects 	<ul style="list-style-type: none"> Scalp laceration Depressed skull fracture Basilar skull fracture 	<ul style="list-style-type: none"> CT scan
Maxillofacial	<ul style="list-style-type: none"> Soft-tissue injury Bone injury Nerve injury Teeth/mouth injury 	<ul style="list-style-type: none"> Visual deformity Malocclusion Palpation for crepitus 	<ul style="list-style-type: none"> Facial fracture Soft-tissue injury bones 	<ul style="list-style-type: none"> Facial bone x-ray CT scan of facial bones
Neck	<ul style="list-style-type: none"> Laryngeal injury C-spine injury Vascular injury Esophageal injury Neurologic deficit 	<ul style="list-style-type: none"> Visual inspection Palpation Auscultation 	<ul style="list-style-type: none"> Laryngeal deformity Subq emphysema Hematoma Bruit Platysmal penetration Pain, tenderness of c-spine 	<ul style="list-style-type: none"> C-spine x-ray Angiography/ duplex exam Esophagoscopy Laryngoscopy
Thorax	<ul style="list-style-type: none"> Thoracic wall injury Subq emphysema Pneumo/hemothorax Bronchial injury Pulmonary contusion Thoracic aortic disruption 	<ul style="list-style-type: none"> Visual inspection Palpation Auscultation 	<ul style="list-style-type: none"> Bruising, deformity, or paradoxical motion Chest wall tenderness, crepitus Diminished breath sounds Muffled heart tones Mediastinal crepitus Severe back pain 	<ul style="list-style-type: none"> Chest x-ray CT scan Angiography Bronchoscopy Tube thoracostomy Pericardiocentesis TE ultrasound

TABLE 1 (continued)
SECONDARY SURVEY

Item to Assess	Establishes/Identifies	Assess	Finding	Confirm By
Abdomen/Flank	<ul style="list-style-type: none"> • Abdominal wall injury • Intraperitoneal injury • Retroperitoneal injury 	<ul style="list-style-type: none"> • Visual inspection • Palpation • Auscultation • Determine path of penetration 	<ul style="list-style-type: none"> • Abdominal wall pain/tenderness • Peritoneal irritation <ul style="list-style-type: none"> • Visceral injury • Retroperitoneal organ injury 	<ul style="list-style-type: none"> • DPL/ultrasound • CT scan • Celiotomy • Contrast GI x-ray studies • Angiography
Pelvis	<ul style="list-style-type: none"> • GU tract injuries • Pelvic fracture(s) 	<ul style="list-style-type: none"> • Palpate symphysis pubis for widening • Palpate bony pelvis for tenderness • Determine pelvic stability only once • Inspect perineum • Rectal/vaginal exam 	<ul style="list-style-type: none"> • GU tract injury (hematuria) • Pelvic fracture • Rectal, vaginal, perineal injury 	<ul style="list-style-type: none"> • Pelvic x-ray • GU contrast studies <ul style="list-style-type: none"> • Urethrogram • Cystogram • IVP • Contrast-enhanced CT
Spinal Cord	<ul style="list-style-type: none"> • Cranial injury • Cord injury • Peripheral nerve(s) injury 	<ul style="list-style-type: none"> • Motor response • Pain response 	<ul style="list-style-type: none"> • Unilateral cranial mass effect • Quadriplegia • Paraplegia • Nerve root injury 	<ul style="list-style-type: none"> • Plain spine x-rays • MRI
Vertebral Column	<ul style="list-style-type: none"> • Column injury • Vertebral instability • Nerve injury 	<ul style="list-style-type: none"> • Verbal response to pain, lateralizing signs • Palpate for tenderness • Deformity 	<ul style="list-style-type: none"> • Fracture vs dislocation 	<ul style="list-style-type: none"> • Plain x-rays • CT scan
Extremities	<ul style="list-style-type: none"> • Soft-tissue injury • Bony deformities • Joint abnormalities • Neurovascular deficits 	<ul style="list-style-type: none"> • Visual inspection • Palpation 	<ul style="list-style-type: none"> • Swelling, bruising, pallor • Malalignment • Pain, tenderness, crepitus • Absence/diminished pulses • Tense muscular compartments • Neurologic deficits 	<ul style="list-style-type: none"> • Specific x-rays • Doppler examination • Compartment pressures • Angiography

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- Adjuncts to secondary survey
 - hemodynamic status
 - CT scan
 - Contrast x-ray studies
 - Extremity x-ray
 - Endoscopy and ultrasonography

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ATLS

- Post resuscitation monitoring and reevaluation
 - reevaluation for new findings or overlooked
 - continuous monitoring of vital signs , urinary output
 - 0.5 ml/kg/hr
 - 1 ml/kg/hr
 - ABG , EKG , pulse oximetry
 - effective analgesia

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ATLS

- Definitive care
 - After identifying the patient's injuries
 - Managing life-threatening problems
 - Obtaining special studies
- Transfer
 - If the patient's injuries exceed the institution's treatment capabilities

