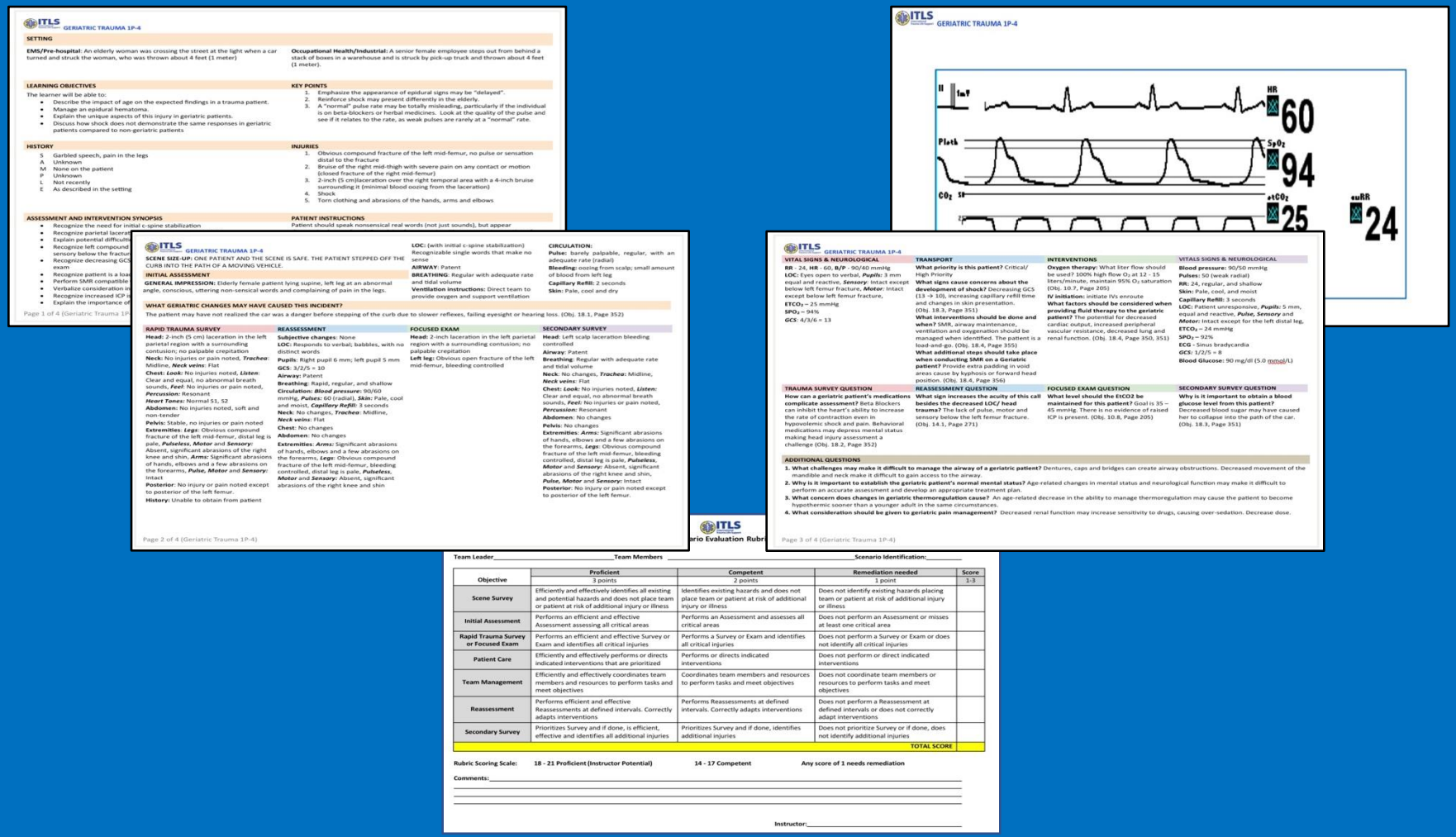
International Trauma Life Support for Emergency Care Providers

Case-Based Learning Scenarios



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Case-Based Learning Scenarios

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Case-Based Learning Scenarios

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Case-Based Learning Overview

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What is the Case-Based Learning Format?

Typically, cases are presented in a story-telling format and are experiential or learning through reflection on doing. The learning process is guided by the instructor, who generates discussion before, during, and after the case. The goal is for the learner to become fully involved in the case, so they can anticipate what they would do if faced with the case circumstances (Stanford, 1994).

What are the Objectives of Case-Based Learning?

The learner will be able to:

1) Present a case analysis that includes identifying relevant facts and developing those facts into logical conclusions.
2) Given a character role in a case, demonstrate appropriate actions specific to the characters role in the case.
3) Conduct themselves in a manner which fosters collaboration and cooperation among members of the trauma team.
4) Perform the skills necessary to assess a trauma patient through multi-sensory perception.
5) Demonstrate the physical ability required to treat and transport a trauma patient.

What are the Attributes of Case-Based Learning?

Case-based learning creates the ability to address the cognitive, affective and psychomotor domains of learning. Learners are guided through advancement from learning toward mastery and are introduced to multiple perspectives through applied group discussions. The case-based model encourages learners to take responsibility, accountability and authority in their learning.

What are the Challenges of Case-Based Learning?

Instructors are required to take an active role in facilitating learner understanding through carefully crafted questions and feedback and enabling learners to integrate the key points and learning objectives. Instructors must ensure cases and course content are synonymous and carefully integrated while encompassing the key points and learning objectives. It is necessary for the entire team to prepare and be comfortable with the material to facilitate an efficient and meaningful case-based learning opportunity.

How to Use ITLS Case-Based Scenarios

Cases will be provided in two banks of scenarios for instructors. The ***Practice Scenario Bank*** provides instructors with a selection of practice scenarios relating to the various concepts in the ITLS course. Practice scenarios are designed to build learner knowledge, skill and critical thinking through a case-based learning experience. Ask open-ended questions that involve the combinations of variables that learners could encounter in the real world. For example, engage the team in critical thinking. Ask, how could a left-sided bubbling chest wound with decreased lung sounds and paradoxical movement affect a head trauma patient?

The ***Test Scenario Bank*** (under development for future release) provides instructors with a selection of testing scenarios relating to the various concepts in the ITLS course. Testing scenarios are designed to evaluate the learner's knowledge, skill and competency using the ITLS objectives as the standard.

As the names suggest, the Practice Scenario Bank should be used during skill station practice, and the Test Scenario Bank should be used during the final practical exam.

ITLS Scenario Format

Each scenario consists of 4 primary pages:

Synopsis: Provides the foundational information the scenario is built around. Even without the remaining scenario pages, many experienced ITLS instructors would be able to provide learners with accurate assessment findings and appropriate interactive discussions and questions.

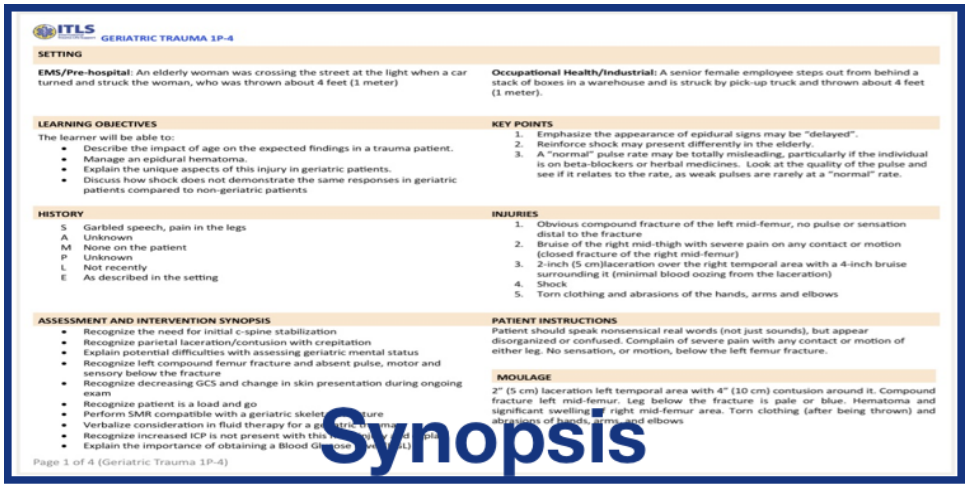
Assessment: Provides assessment findings, in sections, that relate directly to the scene and patient assessment algorithms outlined in the ITLS course and approved materials. These sections include:

- Scene Size-up
- Initial Assessment
- Rapid Trauma Survey
- Reassessment (formerly Ongoing Exam)
- Focused Exam
- Secondary Survey

Expanded Content: Provides additional assessment findings reflecting the initial patient status and status secondary to treatment.

Patient Monitor: Provides a static view of the patient-specific ECG, SPO_2, capnography value and wave form, and vital signs. This information is usually based on the initial vital signs provided in the scenario (most common exception is a stable patient, when it would likely be applied during the Secondary Survey).

Scenario Pages Overview


ITLS GERIATRIC TRAUMA 1P-4

SETTING

EMS/Pre-hospital: An elderly woman was crossing the street at the light when a car turned and struck the woman, who was thrown about 4 feet (1 meter)

Occupational Health/Industrial: A senior female employee steps out from behind a stack of boxes in a warehouse and is struck by pick-up truck and thrown about 4 feet (1 meter).

LEARNING OBJECTIVES

The learner will be able to:

- Describe the impact of age on the expected findings in a trauma patient.
- Manage an epidural hematoma.
- Explain the unique aspects of this injury in geriatric patients.
- Discuss how shock does not demonstrate the same responses in geriatric patients compared to non-geriatric patients

KEY POINTS

1. Emphasize the appearance of epidural signs may be "delayed".
2. Reinforce shock may present differently in the elderly.
3. A "normal" pulse rate may be totally misleading, particularly if the individual is on beta-blockers or herbal medicines. Look at the quality of the pulse and see if it relates to the rate, as weak pulses are rarely at a "normal" rate.

HISTORY

S Garbled speech, pain in the legs
A Unknown
M None on the patient
P Unknown
L Not recently
E As described in the setting

INJURIES

1. Obvious compound fracture of the left mid-femur, no pulse or sensation distal to the fracture
2. Bruise of the right mid-thigh with severe pain on any contact or motion (closed fracture of the right mid-femur)
3. 2-inch (5 cm)laceration over the right temporal area with a 4-inch bruise surrounding it (minimal blood oozing from the laceration)
4. Shock
5. Torn clothing and abrasions of the hands, arms and elbows

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize the need for initial c-spine stabilization
- Recognize parietal laceration/contusion with crepitation
- Explain potential difficulties with assessing geriatric mental status
- Recognize left compound femur fracture and absent pulse, motor and sensory below the fracture
- Recognize decreasing GCS and change in skin presentation during ongoing exam
- Recognize patient is a load and go
- Perform SMR compatible with a geriatric skeletal structure
- Verbalize consideration in fluid therapy for a geriatric trauma
- Recognize increased ICP is not present with this
- Explain the importance of obtaining a Blood Glucose level

PATIENT INSTRUCTIONS

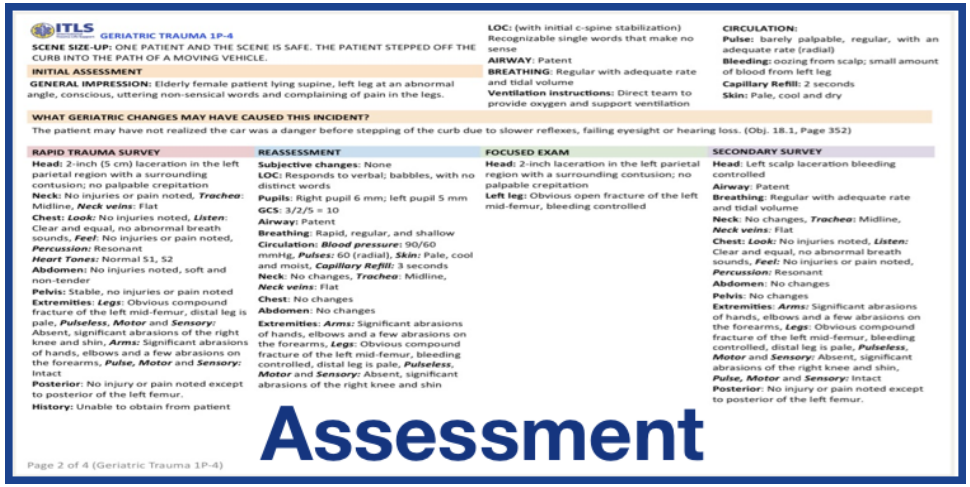
Patient should speak nonsensical real words (not just sounds), but appear disorganized or confused. Complain of severe pain with any contact or motion of either leg. No sensation, or motion, below the left femur fracture.

MOULAGE

2" (5 cm) laceration left temporal area with 4" (10 cm) contusion around it. Compound fracture left mid-femur. Leg below the fracture is pale or blue. Hematoma and significant swelling of right mid-femur area. Torn clothing (after being thrown) and abrasions of hands, arms, and elbows

Page 1 of 4 (Geriatric Trauma 1P-4)

Synopsis


ITLS GERIATRIC TRAUMA 1P-4

SCENE SIZE-UP: ONE PATIENT AND THE SCENE IS SAFE. THE PATIENT STEPPED OFF THE CURB INTO THE PATH OF A MOVING VEHICLE.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Elderly female patient lying supine, left leg at an abnormal angle, conscious, uttering non-sensical words and complaining of pain in the legs.

LOC: (with initial c-spine stabilization) Recognizable single words that make no sense
AIRWAY: Patent
BREATHING: Regular with adequate rate and tidal volume
Ventilation instructions: Direct team to provide oxygen and support ventilation

CIRCULATION:
Pulse: barely palpable, regular, with an adequate rate (radial)
Bleeding: oozing from scalp; small amount of blood from left leg
Capillary Refill: 2 seconds
Skin: Pale, cool and dry

WHAT GERIATRIC CHANGES MAY HAVE CAUSED THIS INCIDENT?

The patient may have not realized the car was a danger before stepping of the curb due to slower reflexes, failing eyesight or hearing loss. (Obj. 18.1, Page 352)

RAPID TRAUMA SURVEY

Head: 2-inch (5 cm) laceration in the left parietal region with a surrounding contusion; no palpable crepitation
Neck: No injuries or pain noted, ***Trachea:*** Midline, ***Neck veins:*** Flat
Chest: ***Look:*** No injuries noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No injuries or pain noted, ***Percussion:*** Resonant
Heart Tones: Normal S1, S2
Abdomen: No injuries noted, soft and non-tender
Pelvis: Stable, no injuries or pain noted
Extremities: ***Legs***: Obvious compound fracture of the left mid-femur, distal leg is pale, ***Pulseless, Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin, ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Pulse, Motor*** and ***Sensory:*** Intact
Posterior: No injury or pain noted except to posterior of the left femur.
History: Unable to obtain from patient

REASSESSMENT

Subjective changes: None
LOC: Responds to verbal; babbles, with no distinct words
Pupils: Right pupil 6 mm; left pupil 5 mm
GCS: 3/2/5 = 10
Airway: Patent
Breathing: Rapid, regular, and shallow
Circulation: ***Blood pressure:*** 90/60 mmHg, ***Pulses:*** 60 (radial), ***Skin:*** Pale, cool and moist, ***Capillary Refill:*** 3 seconds
Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat
Chest: No changes
Abdomen: No changes
Extremities: ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Legs***: Obvious compound fracture of the left mid-femur, bleeding controlled, distal leg is pale, ***Pulseless, Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin

FOCUSED EXAM

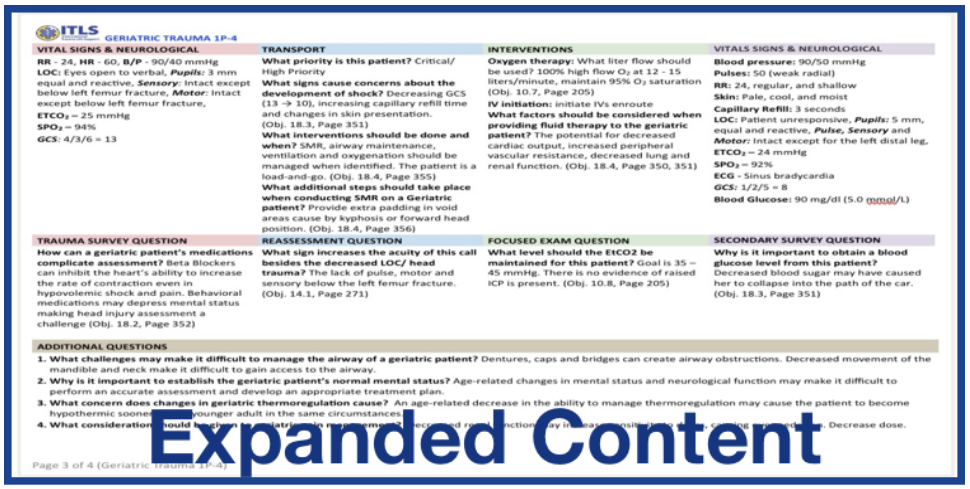
Head: 2-inch laceration in the left parietal region with a surrounding contusion; no palpable crepitation
Left leg: Obvious open fracture of the left mid-femur, bleeding controlled

SECONDARY SURVEY

Head: Left scalp laceration bleeding controlled
Airway: Patent
Breathing: Regular with adequate rate and tidal volume
Neck: No changes, ***Trachea:*** Midline, ***Neck veins:*** Flat
Chest: ***Look:*** No injuries noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No injuries or pain noted, ***Percussion:*** Resonant
Abdomen: No changes
Pelvis: No changes
Extremities: ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Legs***: Obvious compound fracture of the left mid-femur, bleeding controlled, distal leg is pale, ***Pulseless, Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin, ***Pulse, Motor*** and ***Sensory:*** Intact
Posterior: No injury or pain noted except to posterior of the left femur.

Page 2 of 4 (Geriatric Trauma 1P-4)

Assessment


ITLS GERIATRIC TRAUMA 1P-4

VITAL SIGNS & NEUROLOGICAL

RR - 24, **HR** - 60, **B/P** - 90/40 mmHg
LOC: Eyes open to verbal, ***Pupils:*** 3 mm equal and reactive, ***Sensory:*** Intact except below left femur fracture, ***Motor:*** Intact except below left femur fracture,
$ETCO_2$ – 25 mmHg
SPO_2 – 94%
GCS: 4/3/6 = 13

TRANSPORT

What priority is this patient? Critical/ High Priority
What signs cause concerns about the development of shock? Decreasing GCS (13 → 10), increasing capillary refill time and changes in skin presentation. (Obj. 18.3, Page 351)
What interventions should be done and when? SMR, airway maintenance, ventilation and oxygenation should be managed when identified. The patient is a load-and-go. (Obj. 18.4, Page 355)
What additional steps should take place when conducting SMR on a Geriatric patient? Provide extra padding in void areas cause by kyphosis or forward head position. (Obj. 18.4, Page 356)

INTERVENTIONS

Oxygen therapy: What liter flow should be used? 100% high flow O_2 at 12 - 15 liters/minute, maintain 95% O_2 saturation (Obj. 10.7, Page 205)
IV initiation: initiate IVs enroute
What factors should be considered when providing fluid therapy to the geriatric patient? The potential for decreased cardiac output, increased peripheral vascular resistance, decreased lung and renal function. (Obj. 18.4, Page 350, 351)

VITALS SIGNS & NEUROLOGICAL

Blood pressure: 90/50 mmHg
Pulses: 50 (weak radial)
RR: 24, regular, and shallow
Skin: Pale, cool, and moist
Capillary Refill: 3 seconds
LOC: Patient unresponsive, ***Pupils:*** 5 mm, equal and reactive, ***Pulse, Sensory*** and ***Motor:*** Intact except for the left distal leg,
$ETCO_2$ – 24 mmHg
SPO_2 – 92%
ECG - Sinus bradycardia
GCS: 1/2/5 = 8
Blood Glucose: 90 mg/dl (5.0 mmol/L)

TRAUMA SURVEY QUESTION

How can a geriatric patient's medications complicate assessment? Beta Blockers can inhibit the heart's ability to increase the rate of contraction even in hypovolemic shock and pain. Behavioral medications may depress mental status making head injury assessment a challenge (Obj. 18.2, Page 352)

REASSESSMENT QUESTION

What sign increases the acuity of this call besides the decreased LOC/ head trauma? The lack of pulse, motor and sensory below the left femur fracture. (Obj. 14.1, Page 271)

FOCUSED EXAM QUESTION

What level should the EtCO2 be maintained for this patient? Goal is 35 – 45 mmHg. There is no evidence of raised ICP is present. (Obj. 10.8, Page 205)

SECONDARY SURVEY QUESTION

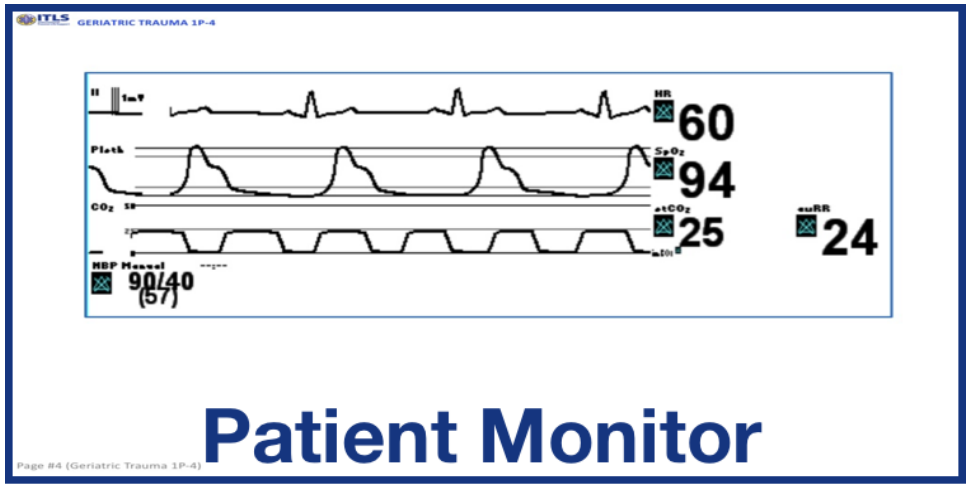
Why is it important to obtain a blood glucose level from this patient? Decreased blood sugar may have caused her to collapse into the path of the car. (Obj. 18.3, Page 351)

ADDITIONAL QUESTIONS

1. **What challenges may make it difficult to manage the airway of a geriatric patient?** Dentures, caps and bridges can create airway obstructions. Decreased movement of the mandible and neck make it difficult to gain access to the airway.
2. **Why is it important to establish the geriatric patient's normal mental status?** Age-related changes in mental status and neurological function may make it difficult to perform an accurate assessment and develop an appropriate treatment plan.
3. **What concern does changes in geriatric thermoregulation cause?** An age-related decrease in the ability to manage thermoregulation may cause the patient to become hypothermic sooner than a younger adult in the same circumstances.
4. **What considerations should be given to geriatric patients receiving medications?** Decrease dose.

Page 3 of 4 (Geriatric Trauma 1P-4)

Expanded Content


ITLS GERIATRIC TRAUMA 1P-4

HR 60
SpO_2 94
$etCO_2$ 25
RR 24
NBP Manual 90/40 (57)

Page #4 (Geriatric Trauma 1P-4)

Patient Monitor

ITLS GERIATRIC TRAUMA 1P-4

SETTING

EMS/Pre-hospital: An elderly woman was crossing the street at the light when a car turned and struck the woman, who was thrown about 4 feet (1 meter)

Occupational Health/Industrial: A senior female employee steps out from behind a stack of boxes in a warehouse and is struck by pick-up truck and thrown about 4 feet (1 meter).

LEARNING OBJECTIVES

The learner will be able to:

- Describe the impact of age on the expected findings in a trauma patient.
- Manage an epidural hematoma.
- Explain the unique aspects of this injury in geriatric patients.
- Discuss how shock does not demonstrate the same responses in geriatric patients compared to non-geriatric patients

KEY POINTS

1. Emphasize the appearance of epidural signs may be "delayed".
2. Reinforce shock may present differently in the elderly.
3. A "normal" pulse rate may be totally misleading, particularly if the individual is on beta-blockers or herbal medicines. Look at the quality of the pulse and see if it relates to the rate, as weak pulses are rarely at a "normal" rate.

HISTORY

S Garbled speech, pain in the legs
A Unknown
M None on the patient
P Unknown
L Not recently
E As described in the setting

INJURIES

1. Obvious compound fracture of the left mid-femur, no pulse or sensation distal to the fracture
2. Bruise of the right mid-thigh with severe pain on any contact or motion (closed fracture of the right mid-femur)
3. 2-inch (5 cm)laceration over the right temporal area with a 4-inch bruise surrounding it (minimal blood oozing from the laceration)
4. Shock
5. Torn clothing and abrasions of the hands, arms and elbows

Synopsis Page (upper portion)

Instructors are provided with a case synopsis identifying the:

- **EMS/Pre-hospital Setting**
- **Occupational Health/Industrial Setting**
- **History**
- **Learning Objectives**
- **Key Points**
- **Patient Injuries**

Note: Each scenario is named and has unique scenario number (e.g., Geriatric Trauma 1P-4).

Synopsis Page (lower portion)

Instructors are provided with a case synopsis identifying the:

- **Assessment and Interventions Synopsis**
- **Patient Instructions**
- **Moulage Instructions**

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize the need for initial c-spine stabilization
- Recognize parietal laceration/contusion with crepitation
- Explain potential difficulties with assessing geriatric mental status
- Recognize left compound femur fracture and absent pulse, motor and sensory below the fracture
- Recognize decreasing GCS and change in skin presentation during ongoing exam
- Recognize patient is a load and go
- Perform SMR compatible with a geriatric skeletal structure
- Verbalize consideration in fluid therapy for a geriatric trauma
- Recognize increased ICP is not present with this head injury and explain
- Explain the importance of obtaining a Blood Glucose Level (BGL)

PATIENT INSTRUCTIONS

Patient should speak nonsensical real words (not just sounds), but appear disorganized or confused. Complain of severe pain with any contact or motion of either leg. No sensation, or motion, below the left femur fracture.

MOULAGE

2" laceration left temporal area with 4" contusion around it. Compound fracture left mid-femur. Leg below the fracture is pale or blue. Hematoma and significant swelling of right mid-femur area. Torn clothing (after being thrown) and abrasions of hands, arms, and elbows

ITLS GERIATRIC TRAUMA 1P-4

SCENE SIZE-UP: One patient and the scene is safe. The patient stepped off the curb into the path of a moving vehicle.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Elderly female patient lying supine, left leg at an abnormal angle, conscious, uttering nonsensical words and complaining of pain in the legs.
Life-Threatening Bleeding: No

LOC: (with initial c-spine stabilization) Recognizable single words that make no sense

AIRWAY: Patent

BREATHING: Regular with adequate rate and tidal volume

Ventilation instructions: Direct team to provide oxygen and support ventilation

CIRCULATION:

Pulse: Barely palpable, regular, with an adequate rate (radial)

Bleeding: Oozing from scalp; small amount of blood from left leg

Capillary Refill: 2 seconds

Skin: Pale, cool and dry

WHAT GERIATRIC CHANGES MAY HAVE CAUSED THIS INCIDENT?

The patient may have not realized the car was a danger before stepping off the curb due to slower reflexes, failing eyesight or hearing loss. (Obj. 18.1, Page 352)

Assessment Page (upper portion)

Instructors are provided with pertinent assessment information broken down as described in the ITLS course and approved materials. The Initial Assessment section provides:

- **Scene Size-Up**
- **General Impression**
- **Level of Consciousness**
- **Airway Status**
- **Breathing**
- **Ventilation Instructions**
- **Circulation (Pulse, Bleeding, Capillary Refill, Skin)**

In addition to the Initial Assessment findings, this section provides recommended questions regarding the findings. Instructors may ask additional questions.

Assessment Page (lower portion)

After completing the Initial Assessment, each assessment that follows is designed to be read from top to bottom in its color-coded column. The assessment algorithm columns progress from left to right as the case unfolds. The assessment information provided is pertinent to the type of assessment and changing patient conditions. The case will indicate the completion of the appropriate assessments based on patient presentation.

Note: The term "REASSESSMENT" is used instead of "ONGOING EXAM" to reflect the terminology in the 9th edition textbook.

RAPID TRAUMA SURVEY	REASSESSMENT	FOCUSED EXAM	SECONDARY SURVEY
Head: 2-inch (5 cm) laceration in the left parietal region with a surrounding contusion; no palpable crepitation **Neck:** No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat **Chest:** ***Look:*** No injuries noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No injuries or pain noted, ***Percussion:*** Resonant ***Heart Tones:*** Normal S1, S2 **Abdomen:** No injuries noted, soft and non-tender **Pelvis:** Stable, no injuries or pain noted **Extremities**: ***Legs***: Obvious compound fracture of the left mid-femur, distal leg is pale, ***Pulseless***, ***Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin, ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Pulse, Motor*** and ***Sensory:*** Intact **Posterior**: No injury or pain noted except to posterior of the left femur. **History:** Unable to obtain from patient	**Subjective changes**: None **LOC:** Responds to verbal; babbles, with no distinct words **Pupils**: Right pupil 6 mm; left pupil 5 mm **GCS**: 3/2/5 = 10 **Airway:** Patent **Breathing**: Rapid, regular, and shallow **Circulation:** ***Blood pressure***: 90/60 mmHg, ***Pulses:*** 60 (radial), ***Skin:*** Pale, cool and moist, ***Capillary Refill:*** 3 seconds **Neck**: No changes, ***Trachea***: Midline, ***Neck veins***: Flat **Chest**: No changes **Abdomen**: No changes **Extremities**: ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Legs***: Obvious compound fracture of the left mid-femur, bleeding controlled, distal leg is pale, ***Pulseless***, ***Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin	**Head:** 2-inch laceration in the left parietal region with a surrounding contusion; no palpable crepitation **Left leg:** Obvious open fracture of the left mid-femur, bleeding controlled	**Head**: Left scalp laceration bleeding controlled **Airway**: Patent **Breathing**: Regular with adequate rate and tidal volume **Neck**: No changes, ***Trachea:*** Midline, ***Neck veins***: Flat **Chest:** ***Look:*** No injuries noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No injuries or pain noted, ***Percussion:*** Resonant **Abdomen**: No changes **Pelvis**: No changes **Extremities**: ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Legs***: Obvious compound fracture of the left mid-femur, bleeding controlled, distal leg is pale, ***Pulseless***, ***Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin, ***Pulse, Motor*** and ***Sensory:*** Intact **Posterior**: No injury or pain noted except to posterior of the left femur.

ITLS GERIATRIC TRAUMA 1P-4

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR - 24, **HR** - 60, **B/P** - 90/40 mmHg **LOC:** Eyes open to verbal, ***Pupils:*** 3 mm equal and reactive, ***Sensory:*** Intact except below left femur fracture, ***Motor:*** Intact except below left femur fracture, **$ETCO_2$ –** 25 mm Hg **SPO_2 –** 94% ***GCS:*** 4/3/6 = 13	**What priority is this patient?** Critical/ High Priority **What signs cause concerns about the development of shock?** Decreasing GCS (13 → 10), increasing capillary refill time and changes in skin presentation. (Obj. 18.3, Page 351) **What interventions should be done and when?** SMR, airway maintenance, ventilation and oxygenation should be managed when identified. The patient is a load-and-go. (Obj. 18.4, Page 355) **What additional steps should take place when conducting SMR on a Geriatric patient?** Provide extra padding in void areas cause by kyphosis or forward head position. (Obj. 18.4, Page 356)	**Oxygen therapy:** What liter flow should be used? 100% high flow O2 at 12 - 15 liters/minute, maintain 95% O_2 saturation (Obj. 10.7, Page 205) **IV initiation:** initiate IVs enroute **What factors should be considered when providing fluid therapy to the geriatric patient?** The potential for decreased cardiac output, increased peripheral vascular resistance, decreased lung and renal function. (Obj. 18.4, Page 350, 351)	**Blood pressure:** 90/50 mmHg **Pulses:** 50 (weak radial) **RR:** 24, regular, and shallow **Skin:** Pale, cool, and moist **Capillary Refill:** 3 seconds **LOC:** Patient unresponsive, ***Pupils:*** 5 mm, equal and reactive, ***Pulse, Sensory*** and ***Motor:*** Intact except for the left distal leg, **$ETCO_2$ –** 24 mm Hg **SPO_2 –** 92% **ECG -** Sinus bradycardia ***GCS:*** 1/2/5 = 8 **Blood Glucose:** 90 mg/dl (5.0 mmol/L)

Expanded Content Page (upper portion)

Vital and neurological signs reflecting the initial patient status and status secondary to treatment are provided. Sections for Transport and Interventions contain recommended questions and information pertinent to the case and for generating discussion. Instructors may ask the learner additional questions.

Expanded Content Page (lower portion)

Recommended questions are provided for each type of assessments performed. Additional general case questions are provided to facilitate discussion to enhance and assess the learner's overall knowledge and understanding. Answers are provided to guide discussion. Instructors may ask the learner additional questions.

Note: The term "REASSESSMENT" is used instead of "ONGOING EXAM" to reflect the terminology in the 9th edition textbook.

TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
How can a geriatric patient's medications complicate assessment? Beta Blockers can inhibit the heart's ability to increase the rate of contraction even in hypovolemic shock and pain. Behavioral medications may depress mental status making head injury assessment a challenge (Obj. 18.2, Page 352)	**What sign increases the acuity of this call besides the decreased LOC/ head trauma?** The lack of pulse, motor and sensory below the left femur fracture. (Obj. 14.1, Page 271)	**What level should the EtCO2 be maintained for this patient?** Goal is 35 – 45 mmHg. There is no evidence of raised ICP is present. (Obj. 10.8, Page 205)	**Why is it important to obtain a blood glucose level from this patient?** Decreased blood sugar may have caused her to collapse into the path of the car. (Obj. 18.3, Page 351)

ADDITIONAL QUESTIONS

1. **What challenges may make it difficult to manage the airway of a geriatric patient?** Dentures, caps and bridges can create airway obstructions. Decreased movement of the mandible and neck make it difficult to gain access to the airway.
2. **Why is it important to establish the geriatric patient's normal mental status?** Age-related changes in mental status and neurological function may make it difficult to perform an accurate assessment and develop an appropriate treatment plan.
3. **What concern does changes in geriatric thermoregulation cause?** An age-related decrease in the ability to manage thermoregulation may cause the patient to become hypothermic sooner than a younger adult in the same circumstances.
4. **What consideration should be given to geriatric pain management?** Decreased renal function may increase sensitivity to drugs, causing over-sedation. Decrease dose.

Patient Monitor Page

Each case includes a patient-specific ECG, SPO_2, capnography value and wave form and vital signs as displayed on a monitor for learner reference. This information is usually based on the initial vital signs provided in the scenario (most common exception is a stable patient, when it would likely be applied during the Secondary Survey). Additional monitor displays may be provided to represent significant changes after patient interventions.

Evaluating Case-Based Learning Scenarios

ITLS chose to use a rubric for guiding learner progress. A rubric is an assessment tool for use by the team to provide ongoing feedback for improving team skill performance and knowledge. Typically, a rubric is comprised of criteria, definitions or descriptors for the degree of achievement, and a rating scale or scoring strategy known as levels (Dawson, 2015).

Rubrics are often designed in a table format, allowing instructors to assess team performance efficiently and providing a framework for the team throughout the learning process. Rubrics aid in simplifying learning criteria. Learners may also use the rubric as a basis for self-assessment, reflection and peer review. A rubric facilitates fair and accurate assessment, fosters understanding and defines the pathway for subsequent learning and teaching. Rubric use integrates performance and feedback, providing ongoing or formative assessment, which has been shown to have a positive impact on learning (Panadero and Jonsson, 2013).

Given the multitude of potential patient interventions and resulting responses, it is the responsibility of the instructor to ensure reasonable and realistic patient responses are provided to interventions.

Summary

ITLS believes in the value of experiential learning to strengthen learner understanding of core concepts and transition the learner from a basic knowledge to mastery of trauma assessment and skills. Clear case objectives and learner expectations are provided to ensure learners benefit from consistent case delivery. Instructor-guided discussion reinforcing key concepts throughout a case is designed to increase learner success.

Questions relating to the use of case-based learning may be directed to your local Chapter or Training Centre or ITLS International.

Scenario Evaluation Rubric

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Using the Rubric

The overall objective for the ITLS course is the learner will be able to perform a patient assessment and rapidly identify and manage critical and life-threatening conditions. To meet this objective requires the learner to complete a scenario being at least competent for each of the performance objectives. A learner cannot do this unless they know how to assess and provide interventions indicated.

The same rubric is used for practice and test evaluations (see comparison below). The rubric is based on a learner's performance in the Case-Based Learning (CBL) modules. Each scenario the learner participates in should be a learning experience. Carefully observe the learner's performance during evaluation. After the scenario is complete, using the rubric, score (rate) the learner's performance and provide comments for possible improvement. A score of 1 in any category/objective requires written documentation detailing the specific reason.

Competency refers to the bare minimum required for acceptability. "Competent" lives in a yes/no framework (an objective observation). One is either competent or not. Proficiency carries with it a level of mastery that is above the minimum and is the degree of competence or expertise. "Proficient" lives in a sliding scale framework (a subjective observation) where one can strive to be more proficient.

Practice & Test
Comparing Two Types of Evaluations

Practice Evaluations	Testing Evaluations
Are meant to assess the learner's ongoing progress and offer the learner the opportunity to reevaluate their progress and identify their strengths and weaknesses. The goal is to improve proficiency. A score is not required.	Used to evaluate the learner's performance and knowledge using ITLS standards or benchmarks. The goal is to prove competence or proficiency. A score is provided.
Takes place after teaching stations and practice scenarios during the course. Remediation for the learner may take place through a series of debriefings, with their team, in other stations or scenarios.	Takes place after the testing scenarios at the end of a course. A score of 1 in any category/objective indicates an overall unsuccessful performance and retesting is required. Written documentation detailing the specific reason for a score of 1 is required.
In addition to instructor feedback, peer and self-assessment are encouraged. Having open dialogue allows the learners to reflect on their performance/knowledge and generate feedback to help them improve.	Feedback from the instructor is done in private with the team leader. However, it may be acceptable to involve the entire team.

Scenario Evaluation Rubric

Team Leader_____ **Team Members** _____ **Scenario Identification:**_____

Objective	Proficient 3 points	Competent 2 points	Remediation needed 1 point	Score 1-3
Scene Survey	Efficiently and effectively identifies all existing and potential hazards and does not place team or patient at risk of additional injury or illness	Identifies existing hazards and does not place team or patient at risk of additional injury or illness	Does not identify existing hazards placing team or patient at risk of additional injury or illness	
Initial Assessment	Performs an efficient and effective Assessment assessing all critical areas	Performs an Assessment and assesses all critical areas	Does not perform an Assessment or misses at least one critical area	
Rapid Trauma Survey or Focused Exam	Performs an efficient and effective Survey or Exam and identifies all critical injuries	Performs a Survey or Exam and identifies all critical injuries	Does not perform a Survey or Exam or does not identify all critical injuries	
Patient Care	Efficiently and effectively performs or directs indicated interventions that are prioritized	Performs or directs indicated interventions	Does not perform or direct indicated interventions	
Team Management	Efficiently and effectively coordinates team members and resources to perform tasks and meet objectives	Coordinates team members and resources to perform tasks and meet objectives	Does not coordinate team members or resources to perform tasks and meet objectives	
Reassessment	Performs efficient and effective Reassessments at defined intervals. Correctly adapts interventions	Performs Reassessments at defined intervals. Correctly adapts interventions	Does not perform a Reassessment at defined intervals or does not correctly adapt interventions	
Secondary Survey	Prioritizes Survey and if done, is efficient, effective and identifies all additional injuries	Prioritizes Survey and if done, identifies additional injuries	Does not prioritize Survey or if done, does not identify additional injuries	
			TOTAL SCORE	

Rubric Scoring Scale: **18 - 21 Proficient (Instructor Potential)** **14 - 17 Competent** **Any score of 1 needs remediation**

Comments:_____

_____

_____

_____

Instructor:_____

Scenario Evaluation Rubric

Objective	Clarification of Criteria	
Scene Survey	Refer to the scenario setting to assess this. Hazards include assessing the mechanism of injury. Adapt to the local environments as needed.	Primary Survey should take less than 2 minutes for critical patients
Initial Assessment	Refer to the scenario to provide findings. Conforms to the ITLS Initial Assessment described in the course and approved materials.	
Rapid Trauma Survey or Focused Exam	The mechanism of injury and the patient's level of consciousness determines which one should be performed. Conforms to the ITLS Rapid Trauma Survey or Focused Exam described in the course and approved materials.	
Patient Care	Refer to the scenario sections "Assessment and Interventions Synopsis" and "Injuries" for expected/anticipated care. Given the multitude of potential patient interventions and resulting responses, it is the responsibility of the instructor to ensure reasonable and realistic patient responses are provided to interventions. Care should be prioritized and timely to enhance a favorable outcome of the patient.	Critical patients should have a scene time of less than 5 minutes
Team Management	Effectively and efficiently uses available resources. The instructor should include team members in the interactive questions asked during and after the scenario.	
Reassessment (formerly Ongoing Exam)	Refer to the scenario sections "Assessment and Interventions Synopsis," "Reassessment," "Transport," and "Interventions" for expected/anticipated care. Conforms to the ITLS Reassessment (formerly Ongoing Exam) described in the course and approved materials.	Critical patients should have it performed every 5 minutes or if patient deteriorates
Secondary Survey	A Secondary Survey may not be indicated in all scenarios (e.g. Load and Go, short transport times, etc.); however, the Secondary Survey findings are provided for all scenarios. Learners may choose to do a Secondary Survey and as long as it does not unnecessarily extend scene time or delay indicated interventions they may be rated as competent or proficient. If performing a Secondary Survey could have a detrimental effect on the patient, the Secondary Survey is not prioritized appropriately and indicates the need for remediation. If completed, conforms to the ITLS Secondary Survey described in the course and approved materials.	

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Practice Scenarios

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Practice Scenarios Set 1

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SETTING

EMS/Pre-hospital: An ambulance has been dispatched to a local sports stadium for an injured soccer/football player who collided with a metal bench on the sidelines.

Occupational Health/Industrial: An ambulance has been dispatched to the warehouse for an injured employee who was struck by a forklift.

LEARNING OBJECTIVES

The learner will be able to:

- Identify a critical blunt abdominal injury and identify associated complications.
- Assess and manage a critical trauma patient with a blunt abdominal injury.
- Describe possible intra-abdominal injuries based on findings of history, physical examination, and mechanism of injury.

KEY POINTS

1. Blunt trauma is the most common cause of abdominal injuries.
2. Blunt trauma may be from direct compression of the abdomen against a fixed object resulting in tears or subcapsular hematomas involving solid intra-abdominal organs (liver/spleen).
3. Injuries may arise from deceleration forces, with tearing of organs and their blood vessels at fixed areas within the abdominal region.
4. Lower rib fractures suggest the possibility of an intra-abdominal injury even in the absence of abdominal pain or tenderness.
5. Be prepared to treat hypovolemic shock from occult intra-abdominal bleeding.
6. Blunt abdominal trauma with pain or tenderness may indicate serious abdominal trauma and the potential for quick development of shock even if initial vital signs are normal.

HISTORY

S Left-sided lower rib pain and wrist pain
A None
M Albuterol, Solu-Medrol, naproxen and ibuprofen
P Asthma
L Sports drink 30 minutes
E As described in the setting

INJURIES

1. Intra-abdominal bleeding
2. Left lower rib fractures
3. Shock
4. Open left distal radial fracture

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize significant Mechanism of Injury and load and go
- Recognize difficulty breathing and delegate high-flow O_2
- Recognize significance of injuries to chest, abdomen and the potential for rapid deterioration
- Initiate fluid therapy during transport titrated to maintain level of consciousness, and avoid hypotension
- Recognize significance of evolving changes in abdominal presentation
- Obtain a blood glucose level
- Consider aeromedical transport
- Consider pain control
- Splint wrist fracture if time allows

PATIENT INSTRUCTIONS

Patient should be alert, but anxious and complaining of left-sided rib pain, left wrist pain and left shoulder (referred pain). Complain of pain on left side of abdomen only when upper left quadrant is palpated. Speak in short sentences (2-3 words) due to rib pain. Simulate shallow and rapid respirations if able to do so safely. No head, neck or back pain and no loss of consciousness.

MOULAGE

Open left wrist fracture with minor distracting bleeding. (If open fracture is not possible, show bruising over the left wrist [closed fracture]). Bruising to lower left ribs on the mid-axillary line. Simulate shock with pale and moist skin.

ABDOMINAL TRAUMA 1P-1

SCENE SIZE-UP: One patient and scene is safe. Blunt force abdominal trauma from colliding with an immoveable object.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Patient is lying on their left side in a recumbent position. Awake with obvious signs of shock and difficulty breathing complaining of wrist and rib pain. **Life-Threatening Bleeding:** No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Rapid, regular, and shallow

Ventilation instructions: Direct team to consider oxygen via non-rebreather mask.

CIRCULATION:

Pulse – Rapid, strong and regular radial and carotid pulses present

Bleeding: Minor active bleeding from left wrist fracture; no major bleeding

Capillary Refill: <2 seconds

Skin: Pale, moist and cool

WHAT SIGNS FROM THE INITIAL ASSESSMENT INDICATE THE PATIENT MAY BE IN SHOCK?

Anxiousness, tachycardia, tachypnea, pale, cool and moist skin (Obj. 8.2, Page 157)

RAPID TRAUMA SURVEY

Head: No injuries or pain noted

Neck: No injuries or pain noted*, **Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Left lateral lower chest bruising mid-axillary line, ***Feel***: Crepitus on left side (lower ribs), ***Listen***: Clear and equal, no abnormal breath sounds, ***Percussion***: Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Pain and rigidity in left upper quadrant, right quadrants unremarkable

Pelvis: Stable

Extremities: ***Legs***: No injuries or pain noted, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Arms: Left***: open wrist fracture (good distal pulses, movement sensation), ***Arms: Right***: no injuries, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injuries or pain noted

History: Obtain from patient

REASEESSMENT

Subjective changes: No changes

LOC: Alert

Pupils: 5 mm, equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Rapid, irregular, and shallow due to rib pain

Circulation*: Pulses*: 140 with no treatment; 112 with appropriate bolus, ***Skin:*** Pale, cool and moist, ***Capillary refill:*** <2 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: Left side tender, rigid and now distended

Identified injuries: No changes

FOCUSED EXAM

Chest: Rib fractures

Abdomen: Pain

Left Arm: Wrist fracture

SECONDARY SURVEY

Head: No changes

Airway: No changes

Breathing: Rapid, irregular, and shallow due to rib pain.

Neck: No changes, ***Trachea*:** Midline, ***Neck veins****:* Flat

Chest: ***Look***: No changes, ***Listen:*** No changes, ***Feel***: No changes, ***Percussion:*** No changes

Abdomen: Left upper and lower quadrant pain, rigidity and distention

Pelvis: No changes

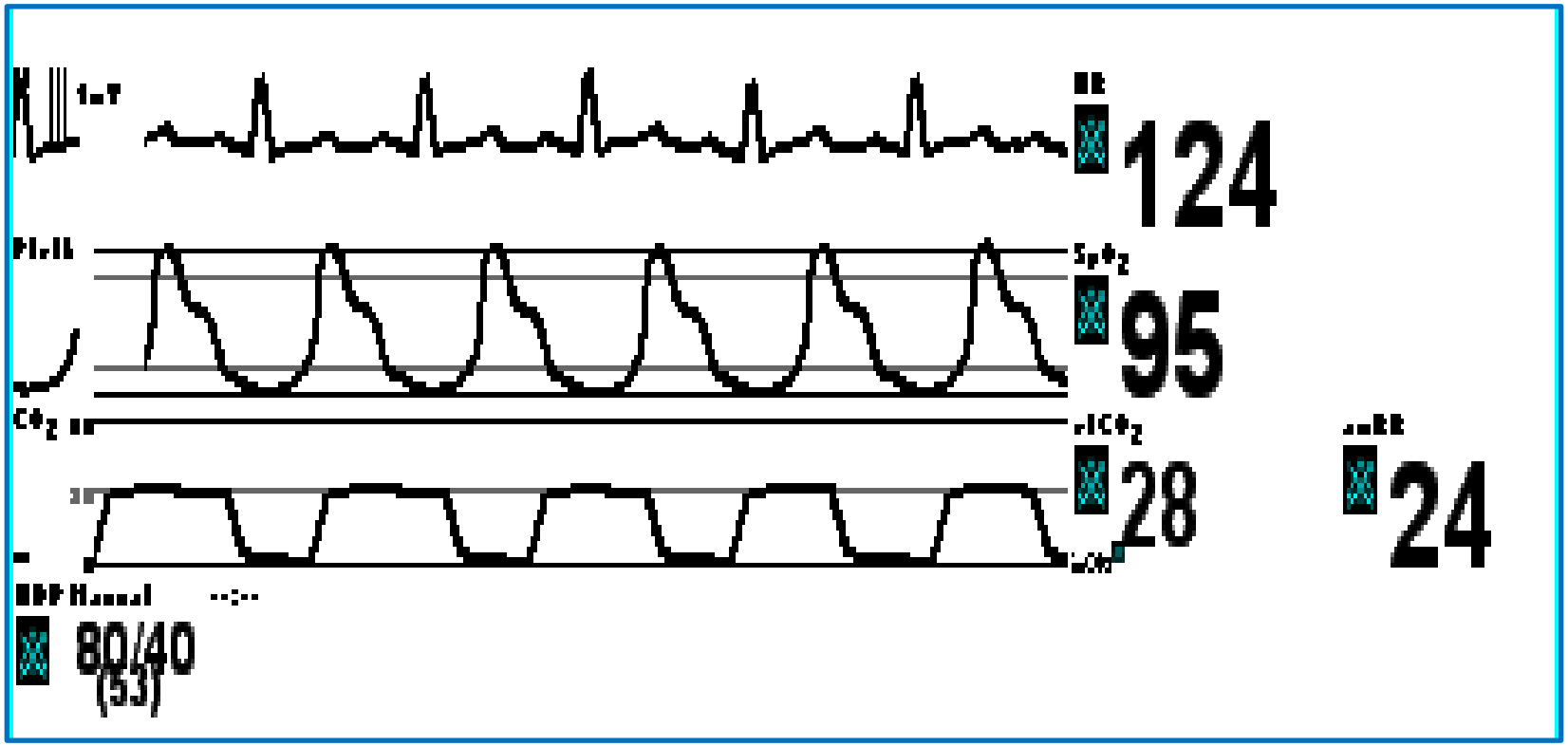
Extremities: ***Arms***: No changes, ***Legs:*** No changes

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITAL SIGNS & NEUROLOGICAL
RR: 24, **HR:** 124, **B/P:** 80/40 mmHg **LOC:** Alert, but anxious, ***Pupils:*** 5 mm, equal and reactive, ***Sensory*** *and* ***Motor****:* Intact **$ETCO_2$:** 28 mmHg **SPO_2:** 95% **GCS**: 4/5/6 = 15	**What priority is this patient?** Critical/High Priority **Where should this patient be transported to?** Trauma Center **Should alternative transport be provided?** Consider aeromedical transport **What interventions should be done?** Patient should be oxygenated on scene, rapidly transported with fluid therapy and splinting initiated during transport. (Obj: 2.6, Page 40)	**Oxygen therapy:** **What liter flow should be used?** High-flow O_2 at 12 – 15 liters/minute (Obj: 4.3, Page 78) **IV initiation:** **How much fluid should be administered?** If no traumatic brain injury, titrate boluses to maintain consciousness. Avoid hypotension. (Obj: 8.7, Page 169) **Consider pain control** Need to cover the open wound	**BP**: 136/70 mmHg (without pain control); 124/64 mmHg (with pain control) **HR**: 102 strong and regular (without pain control); 90 strong and regular (with pain control) **RR**: 24, irregular, and shallow due to rib pain **LOC:** Alert, ***Pupils:*** 5 mm, equal and reactive, ***Sensory*** and ***Motor***: Intact **$ETCO_2$**: 34 mmHg **SPO_2:** 97% **ECG:** Sinus tachycardia ***GCS:*** 15 if shock treated; 8 if untreated (2/2/4). **Blood Glucose:** 90 mg/dl (5.0 mmol/L)

TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
What injuries may be associated with the findings to the chest? Flail chest, hemothorax, pneumothorax, cardiac tamponade. (Obj: 6.2, Page 127) **What injuries may be associated with the findings in the abdomen?** Ruptured or torn organs and vessels. (Obj: 13.1, Page 257)	**Could the injuries to the chest worsen? If so, how?** Fractured ribs could cause further tissue or organ damage, a pneumothorax could cause a tension pneumothorax, and cardiac tamponade could cause an arrest. (Obj: 6.3, Page 127) **Could the injuries to the abdomen worsen?** Unmanaged bleeding could lead to shock. (Obj: 13.5, Page 259)	**Are any of these findings inconsistent with the working impression/diagnosis?** Decreased blood pressure, increased heart rate, decreasing level of consciousness, increasing abdominal distention and rigidity indicate internal bleeding and shock. (Obj: 13.6, Page 259)	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** A Secondary Survey may be performed on scene if the Primary Survey does not reveal a critical condition. A Secondary Survey may not be performed if interventions during transport do not allow time for a Secondary Survey. (Obj. 2.8, Page 43)

ADDITIONAL QUESTIONS

1. **What is the most common cause of abdominal injuries?** Blunt trauma
2. **Could lower rib fractures suggest the possibility of an intra-abdominal injury even in the absence of abdominal pain or tenderness?** Yes
3. **What are some critical interventions for patients with abdominal injuries?** Rapid assessment and recognition of potential injury; rapid, safe transport to an appropriate hospital; fluid therapy; pelvic binding; consider TXA; Focused Assessment with Sonography in Trauma (FAST exam)



SETTING

EMS/Pre-hospital: You are dispatched at nighttime to a rural roadway for a vehicle vs. farm tractor accident.

Occupational Health/Industrial: You are dispatched to your local parking lot for a vehicle that struck an industrial vehicle that is moving metal casting ingots.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat life-threatening injuries.
- Identify the major signs and symptoms of abdominal trauma.
- Explain the pathophysiology of shock and the relationship with abdominal trauma.
- Describe the appropriate management of abdominal injuries.

KEY POINTS

1. Emphasize the need for appropriate examinations of all patients.
2. Reinforce the potentials for occult injuries.
3. Reinforce the potentials of patients that could worsen during care and treatment

HISTORY

S Slight tenderness at seatbelt abrasions
A Penicillin
M Beta blocker; Statin medications
P High blood pressure and high cholesterol
L Several hours ago at lunch
E As described in the setting

INJURIES

1. Liver laceration
2. Shock presentation

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize significant Mechanism of Injury and load and go
- Recognize significance of injuries to abdomen, and the potential for rapid deterioration
- Frequently reassess patient for signs or symptoms of shock
- Initiate fluid therapy during transport titrated to maintain peripheral pulses
- Recognize significance of changes in abdominal presentation
- Consider aeromedical transport

PATIENT INSTRUCTIONS

You are quiet but when approached by EMS, advise them that you wore your seatbelt and you think you are fine.

MOULAGE

Seatbelt marks (abrasions) across abdomen

ABDOMINAL TRAUMA 1P-2

SCENE SIZE-UP: You are dispatched to a rural roadway for a vehicle vs. tractor accident.

INITIAL ASSESSMENT

GENERAL IMPRESSION:. Patient is walking around at the scene, responsive but quiet; initially refusing care. Airbag deployed. **Life-Threatening Bleeding:** No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Adequate, normal rate and depth

Ventilation instructions: None

CIRCULATION:

Pulse – Radial present, strong and rapid

Bleeding: No signs of external hemorrhage

Capillary Refill: <2 seconds

Skin: Warm, pink and dry

IF THERE ARE INDICATIONS OF ALCOHOL INVOLVED IN THIS INCIDENT, WOULD IT IMPACT YOUR GENERAL IMPRESSION?

The presence of mind-altering substances can impact the reliability of a patient. (Obj. 20.1, Page 373)

RAPID TRAUMA SURVEY

Head: No injuries or pain noted

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No bruising, ***Feel***: No injuries or pain noted), ***Listen***: Clear and equal, no abnormal breath sounds, ***Percussion***: normal, ***Heart Tones:*** Normal S1, S2

Abdomen: Bruising noted across lower abdominal cavity. Guarding with palpation. Minimal pain/discomfort noted with palpation right upper quadrant

Pelvis: No injuries or pain noted

Extremities: ***Legs***: No injuries or pain noted, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Arms:*** No injuries or pain noted, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injuries or pain noted

History: Obtain from patient

REASSESSMENT

Subjective changes: During care of the patient, it is noted that the skin signs change and the patient begins to appear pale.

LOC: Alert

Pupils: Equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Increased rate and depth from initial SPO_2: 92%. Should decide to place patient on oxygen

Circulation*: Pulses:* 112 ***Skin:*** Pale, cool and moist, ***Capillary refill:*** <2 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: Becoming rigid and increased pain noted right upper quadrant with palpation

Identified injuries: No changes

FOCUSED EXAM

Abdomen: Pain and bruising present, suspecting abdominal injury and shock

SECONDARY SURVEY

Head: No changes

Airway: No changes

Breathing: 24 and labored

Circulation: Weaker pulses and unequal peripherally vs. central

Neck: No changes, ***Trachea*:** Midline, ***Neck veins:*** Flat

Chest: ***Look***: No changes, ***Listen:*** No changes, ***Feel***: No changes, ***Percussion:*** No changes

Abdomen: Tender, bruise across lower quadrants, rigid

Pelvis: No changes

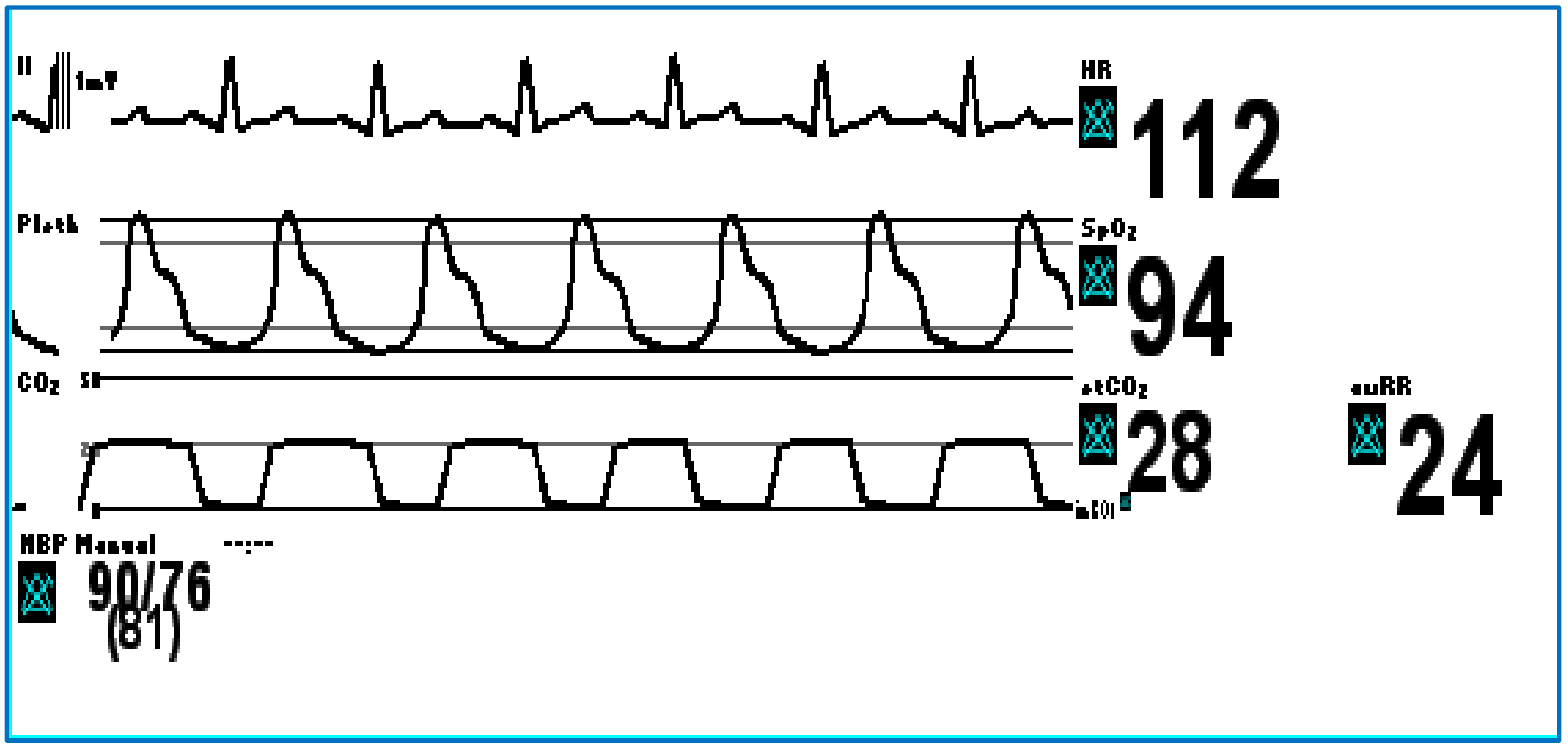
Extremities: ***Arms***: No changes ***Legs:*** No changes

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITAL SIGNS & NEUROLOGICAL
RR: 24, **HR:** 112, **B/P:** 90/76 mmHg **LOC:** Alert, but anxious, ***Pupils:*** Equal and reactive, ***Sensory*** *and* ***Motor****:* Intact, **$ETCO_2$:** 28 mmHg **SPO_2:** 94% **GCS:** 4/5/6 = 15	**What priority is this patient?** Critical/High Priority **Where should this patient be transported to?** Nearest appropriate facility **Should alternative transport be provided?** Consider aeromedical transport if extended transport time **What interventions should be done?** Patient should be oxygenated on scene, rapidly transported with fluid therapy initiated during transport. (Obj: 2.6, Page 40)	**Oxygen therapy:** **What liter flow should be used?** High-flow O_2 at 12 – 15 liters/minute (Obj: 4.3, Page 78) **IV initiation:** **How much fluid should be administered?** Maintain peripheral pulses, uncontrolled internal bleeding (Obj: 8.7, Page 169)	**BP**: 80/52 mmHg without IV fluids; 90/70 with IV fluids **HR**: 120 without IV fluids; 110 with IV fluids **RR**: 24 regular, labored **LOC:** Alert, ***Pupils:*** Equal and reactive, ***Sensory*** and ***Motor***: Intact **$ETCO_2$:** 24 mmHg **SPO_2:** 94% **ECG:** Sinus tachycardia **GCS**: 4/5/6 = 15 **Blood Glucose:** 82 mg/dl (4.6 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
Patients with abdominal injuries and complaining of right poster shoulder pain may be an indication of what? Referred pain from liver injury (Obj: 13.6, Page 259) **What injuries may be associated with the findings in the abdomen?** Ruptured or torn organs and vessels (Obj: 13.1, Page 257)	**How frequently should the Reassessment be performed on this patient?** Every 5 minutes, each time an intervention is performed and if condition worsens (Obj: 2.7, Page 41) **Could the injuries to the abdomen worsen?** Unmanaged bleeding could lead to shock (Obj: 13.5, Page 259)	**Periumbilical bruising (Cullen's sign) may indicate what?** Retroperitoneal hemorrhage (Obj: 13.6, Page 259)	**With appropriate oxygenation and ventilation what may cause a decrease in this patients $ETCO_2$?** Circulatory collapse (Obj. 8.1, Page 159)

ADDITIONAL QUESTIONS

1. Does periumbilical bruising (Cullen's sign) have an early onset or late? Late

2. What is the treatment for eviscerations? Cover organ(s) with gauze moistened with saline or water



SETTING

EMS/Pre-hospital: The patient was cleaning mechanical parts in an open container of gasoline (petrol). The gasoline (petrol) ignited, and a friend extinguished the fire. The patient has burns to the anterior chest, hands and face.

Occupational Health/Industrial: The patient was cleaning machine parts in a solvent. The solvent ignited, and a co-worker extinguished the fire. The patient has burns to the anterior chest, hands and face.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat life-threatening injuries.
- Identify the major signs and symptoms of airway burns.
- Explain the pathophysiology, management of burns and anticipation of changes due to swelling.

KEY POINTS

1. Emphasize load-and-go conditions.
2. Discuss the mechanics of burns to the airway and the need to stop the burning process on burn sites.
3. Stress the importance of anticipating progressively worsening airway compromise.

HISTORY

S Complains of pain and dyspnea
A No known allergies
M No current medications
P No significant medical history
L Ate a light meal about 2 hours ago
E As described in the setting

INJURIES

1. Superficial and partial thickness (1st and 2nd degree) burns to face.
2. Superficial and partial thickness (1st and 2nd degree) burns to anterior chest.
3. Partial thickness (2nd degree) burns to hands.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Cool burns
- Provide O_2 therapy
- Recognize no evidence of burns to airway
- Apply dry dressing to burns
- IV therapy in transit
- Consider pain control
- Assess for compartmental syndrome on arms

PATIENT INSTRUCTIONS

Patient responds slowly and is alert and oriented. Patient complains of pain in the face, chest and hands. Patient's consciousness may decrease as airway swelling develops.

MOULAGE

Pale skin. Superficial and partial thickness (1st and 2nd degree) burns to face, chest and hands. Burned shirt on scene.

BURNS 1P-3

SCENE SIZE-UP: One patient and scene is safe. Cleaning parts and solvent ignited.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Potentially unstable, medium priority with possibility of becoming high priority. Burns to face, chest and hands.
Life-Threatening Bleeding: No

LOC: Alert and answering questions
AIRWAY: Patent
BREATHING: Slightly elevated rate, regular, with adequate bilateral chest wall excursions

CIRCULATION:
Pulse – Slightly elevated rate, strong and regular (Radial)

Bleeding: None
Capillary Refill: < 2 seconds
Skin: Non-burned skin is pink, warm and dry

WHAT IS THE PURPOSE OF THE INITIAL ASSESSMENT?

To prioritize the patient and to identify immediately life-threatening conditions (Obj.2.3, Page 34)

RAPID TRAUMA SURVEY

Head: Superficial and partial thickness (1st and 2nd degree) burns to face and neck; singed eyebrows; no swelling of lips or nose; no evidence of soot

Neck: ***Trachea***: Midline, ***Neck veins***: Flat

Chest: Pain to the anterior aspect, ***Look:*** Superficial and partial thickness (1st and 2nd) degree burns, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No instability or crepitus, ***Percussion***: Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries or pain noted

Pelvis: No injuries or pain noted

Extremities: ***Legs***: No injuries or pain noted, ***Pulse***, ***Motor*** and ***Sensory***: Intact, ***Arms***: 2nd degree burns to the front and back of both hands and hands, ***Pulse, Motor*** and ***Sensory***: Intact

Posterior: No injury or pain noted

History: (Obtain from patient)

REASSESSMENT

Subjective changes: No changes

LOC: Alert, responds verbally

Pupils: 4 mm, equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Slightly elevated rate, regular, with adequate tidal volume, no abnormal sounds

Circulation: Pulses: Slightly elevated rate, strong and regular (radial)

Skin: Unburned skin is pink, warm and dry

Neck: No swelling, 1st and 2nd degree burns, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Breath sounds: No changes

Abdomen: No changes

Pelvis: No changes

Extremities: ***Arms:*** 2nd degree burns to both hands, ***Pulse, Motor*** and ***Sensory***: Intact

FOCUSED EXAM

Head: Red, dry, painful skin, some areas mottled red, blistered painful skin

Neck: Red, dry, painful skin, some areas red, blistered painful skin, no apparent swelling

Chest: Red, dry, painful skin, some areas mottled red, blistered painful skin, no apparent swelling

Upper Extremities: Red, blistered painful skin

SECONDARY SURVEY

Head: No changes

Airway: Patent

Breathing: Slightly elevated rate, regular, with adequate tidal volume, no abnormal sounds

Circulation: ***Pulses:*** Slightly elevated rate, strong and regular (radial)

Skin: Unburned skin is pink, warm and dry

Neck: 1st and 2nd degree burns, no apparent swelling, ***Trachea*****:** Midline, ***Neck veins****:* Flat

Chest: Pain to the anterior aspect, ***Look:*** 1st and 2nd degree burns, ***Listen:*** Clear and equal, **Feel:** No instability or crepitus, **Percussion:** Resonant

Abdomen: No changes

Pelvis: No changes

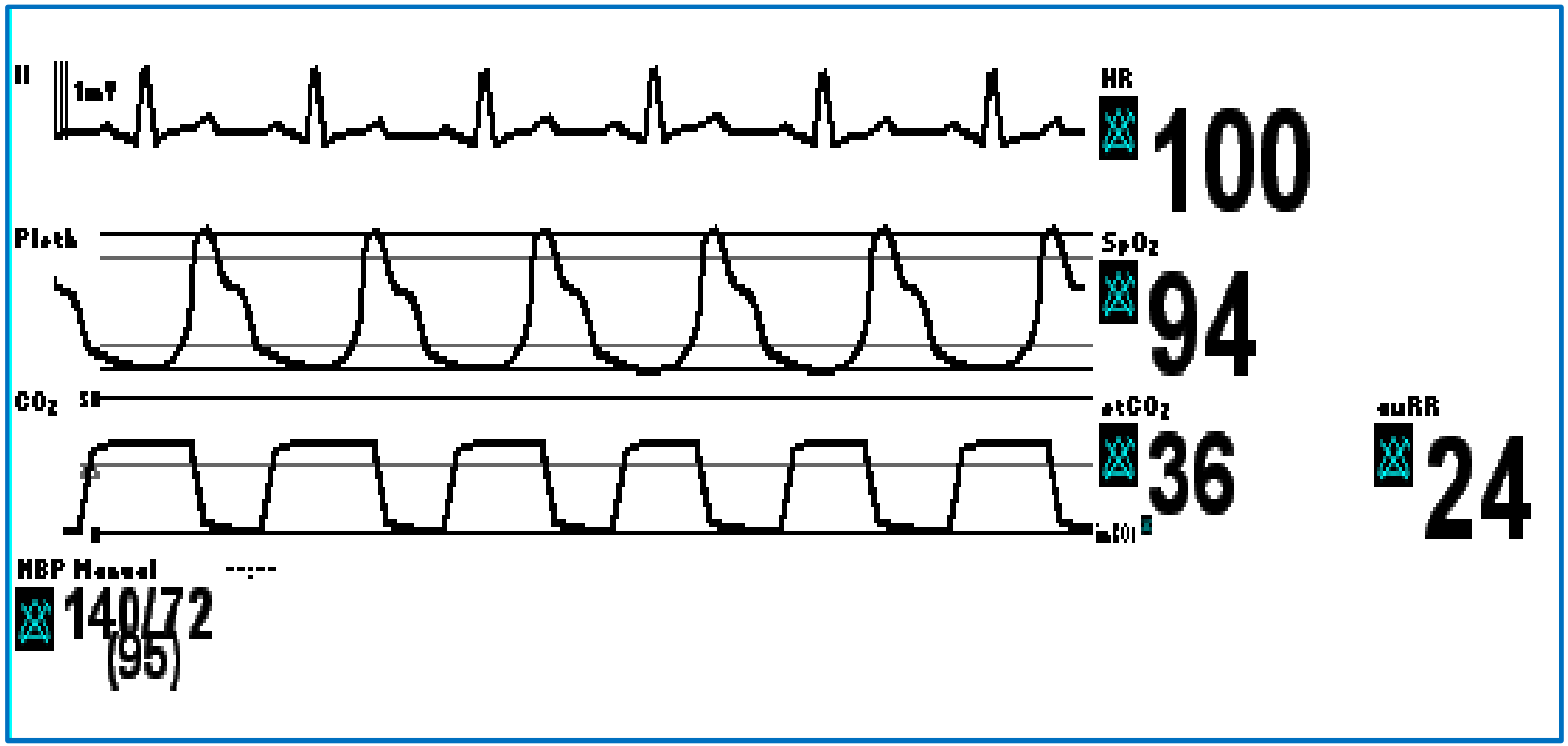
Extremities: ***Arms:*** 2nd degree burns to both hands, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Legs:*** No changes, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No changes

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITAL SIGNS & NEUROLOGICAL
RR: 24, **HR:** 100, **B/P:** 140/72 mmHg **LOC**: Alert, responds spontaneously to voice, ***Pupils:*** 4 mm, equal and reactive, ***Sensory****:* Intact, ***Motor****:* Intact**,** **$ETCO_2$:** 36 mmHg **SPO_2:** 94% **GCS**: 4/5/6 = 15	**What priority is this patient?** Medium priority patient. Potential for high priority if airway becomes compromised (Obj. 2.6, Page 40) **How should the patient be packaged?** Cool burns and apply clean (sterile) dressings (Obj.16.6. a, Page 311) Spinal Motion Restriction not indicated (Obj. 2.3, Page 35)	**Oxygen therapy:** Delegated after the Rapid Trauma Survey of the head is complete and after facial burns have been cooled (Obj. 16.6.a, Page 310) **Cooling of burns:** With room temperature, clean water, followed by covering the burns with clean dry dressings, and clean dry blankets to prevent hypothermia (Obj. 16.6.a, Page 311) **IV initiation: S**hould be performed en route to prevent transport delay (Obj. 16.6.a, Page 311) Pain control essential if available	**Blood Pressure**: 136/70 mmHg (without pain control); 124/64 mmHg (with pain control) **HR**: 102, strong and regular (without pain control); 90, strong and regular (with pain control) **RR**: 24 **LOC:** Alert and oriented, ***Pupils:*** 4 mm, equal and reactive, ***Sensory:*** Intact, ***Motor:*** Intact **$ETCO_2$:** 36 mmHg **SPO_2:** 94% **ECG:** Sinus tachycardia (without pain control); normal sinus rhythm (with pain control) ***GCS:*** 4/5/6 = 15 ***Blood Glucose:*** 130 mg/dl (7.2 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
Why did you decide on this type of survey? To ensure no burns/wounds are missed. The patient is a medium priority/ potentially high priority patient due to: - the Mechanism of Injury - the potential for airway compromise - the potential for compartmentalization of burned upper extremities. - severe pain to the, head, neck, chest and upper extremities (Obj. 2.3, Page 38)	**How often should a Reassessment be completed and recorded?** - Every 5 minutes for critical patients and every 15 minutes for stable patients - Or each time a patient is moved; each time an intervention is performed; any time the patient's condition worsens (Obj. 2.7, Page 41) **What is the body surface area (BSA) burned, using the "Rule of Nines", based on the burns described?** Head – 9% Chest – 9% Arms & Hands– 18% Total– 36%	**When should a Focused Exam be performed?** When there is no significant Mechanism of Injury, the initial assessment is normal, and there is no complaint of dyspnea, chest, abdominal, or pelvic pain (Obj. 2.6, Page 38) **Are these findings consistent with the classification of burns during assessment?** - Yes. First degree burns are characterized as red, dry, and painful - Second degree burns are characterized as mottled red, blistered painful skin (Obj. 16.3, Page 306)	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** - A Secondary Survey may be performed on scene if the Primary Survey does not reveal a critical condition - A Secondary Survey may be deferred or not completed if interventions during transport do not allow time for a Secondary Survey (Obj. 2.8, Page 43)

ADDITIONAL QUESTIONS

1. **When does burn care take precedence over airway management?** When the patient is still actively burning. This is usually best done as quickly as possible with room-temperature tap water.
2. **What symptoms may be caused following a severe burn which encircles a limb?** The eschar may restrict the limbs ability to swell causing compartmental syndrome in the affected limb.
3. **What are some areas where small partial or full-thickness (2nd and 3rd degree) burns are considered more serious?** The neck, armpits, major joints, hands, groin, and feet.



SETTING

EMS/Pre-hospital: An elderly woman was crossing the street at the light when a car turned and struck the woman, who was thrown about 4 feet (1 meter).

Occupational Health/Industrial: A senior female employee was stepping out from behind a stack of boxes in a warehouse when she was struck by a pick-up truck and thrown about 4 feet (1 meter).

LEARNING OBJECTIVES

The learner will be able to:

- Describe the impact of age on the expected findings in a trauma patient.
- Manage an epidural hematoma.
- Explain the unique aspects of this injury in geriatric patients.
- Discuss how shock does not demonstrate the same responses in geriatric patients compared to non-geriatric patients.
- Discuss issues of comorbidity factors and medications

KEY POINTS

1. Emphasize the appearance of epidural hematoma signs may be "delayed".
2. Reinforce shock may present differently in the elderly.
3. A "normal" pulse rate may be totally misleading, particularly if the individual is on beta-blockers or herbal medicines. Look at the quality of the pulse and see if it relates to the rate, as weak pulses are rarely at a "normal" rate.

HISTORY

S Garbled speech, pain in the legs
A Unknown
M None on the patient
P Unknown
L Not recently
E As described in the setting

INJURIES

1. Obvious compound fracture of the left mid-femur, no pulse or sensation distal to the fracture
2. Bruise of the right mid-thigh with severe pain on any contact or motion (closed fracture of the right mid-femur)
3. 2-inch (5 cm) laceration over the right temporal area with a 4-inch (10 cm) bruise surrounding it (minimal blood oozing from the laceration)
4. Shock
5. Torn clothing and abrasions of the hands, arms, elbows and right lower leg

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize the need for initial c-spine stabilization
- Recognize parietal laceration/contusion with crepitation
- Explain potential difficulties with assessing geriatric mental status
- Recognize left compound femur fracture and absent pulse, motor and sensory below the fracture
- Recognize decreasing GCS and change in skin presentation during Reassessment
- Recognize patient is a load and go
- Perform SMR compatible with a geriatric skeletal structure
- Verbalize consideration in fluid therapy for a geriatric trauma
- Recognize increased ICP is not present with this head injury and explain
- Explain the importance of obtaining a Blood Glucose Level (BGL)

PATIENT INSTRUCTIONS

Patient should speak nonsensical real words (not just sounds) but appear disorganized or confused. Complain of severe pain with any contact or motion of either leg. No sensation, or motion, below the left femur fracture.

MOULAGE

2-inch (5 cm) laceration left temporal area with 4-inch (10 cm) contusion around it. Compound fracture left mid-femur. Leg below the fracture is pale or blue. Hematoma and significant swelling of right mid-femur area. Torn clothing (after being thrown) and abrasions of hands, arms, and elbows.

GERIATRIC TRAUMA 1P-4

SCENE SIZE-UP: One patient and the scene is safe. The patient stepped off the curb into the path of a moving vehicle.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Elderly female patient lying supine, left leg at an abnormal angle, conscious, uttering nonsensical words and complaining of pain in the legs.
Life-Threatening Bleeding: No

LOC: (with initial c-spine stabilization) Recognizable single words that make no sense

AIRWAY: Patent

BREATHING: Regular with adequate rate and tidal volume

Ventilation instructions: Direct team to provide oxygen and support ventilation

CIRCULATION:

Pulse: Barely palpable, regular, with an adequate rate (radial)

Bleeding: Oozing from scalp; small amount of blood from left leg

Capillary Refill: 2 seconds

Skin: Pale, cool and dry

WHAT GERIATRIC CHANGES MAY HAVE CAUSED THIS INCIDENT?

The patient may have not realized the car was a danger before stepping of the curb due to slower reflexes, failing eyesight or hearing loss. (Obj. 18.1, Page 352)

RAPID TRAUMA SURVEY

Head: 2-inch (5 cm) laceration in the left parietal region with a surrounding contusion; no palpable crepitation

Neck: No injuries or pain noted*, **Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No injuries noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No injuries or pain noted, ***Percussion:*** Resonant
Heart Tones: Normal S1, S2

Abdomen: No injuries noted, soft and non-tender

Pelvis: Stable, no injuries or pain noted
Extremities: ***Legs***: Obvious compound fracture of the left mid-femur, distal leg is pale, ***Pulseless***, ***Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin, ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injury or pain noted except to posterior of the left femur

History: Unable to obtain from patient

REASSESSMENT

Subjective Changes: None

LOC: Responds to verbal; babbles, with no distinct words

Pupils: Right pupil 6 mm; left pupil 5 mm

GCS: 3/2/5 = 10

Airway: Patent

Breathing: Rapid, regular, and shallow

Circulation: ***Blood pressure*:** 90/60 mmHg, ***Pulses:*** 60 (radial), ***Skin:*** Pale, cool and moist, ***Capillary Refill:*** 3 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Extremities: ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Legs***: Obvious compound fracture of the left mid-femur, bleeding controlled, distal leg is pale, closed fracture right femur ***Pulseless***, ***Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin

FOCUSED EXAM

Head: 2-inch (5 cm) laceration in the left parietal region with a surrounding contusion; no palpable crepitation

Left leg: Obvious open fracture of the left mid-femur, bleeding controlled

Right leg: Closed fracture of the left mid-femur

SECONDARY SURVEY

Head: Left scalp laceration bleeding controlled

Airway: Patent

Breathing: Regular with adequate rate and tidal volume

Neck: No changes, ***Trachea*:** Midline, ***Neck veins****:* Flat

Chest: ***Look:*** No injuries noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No injuries or pain noted, ***Percussion:*** Resonant

Abdomen: No changes

Pelvis: No changes

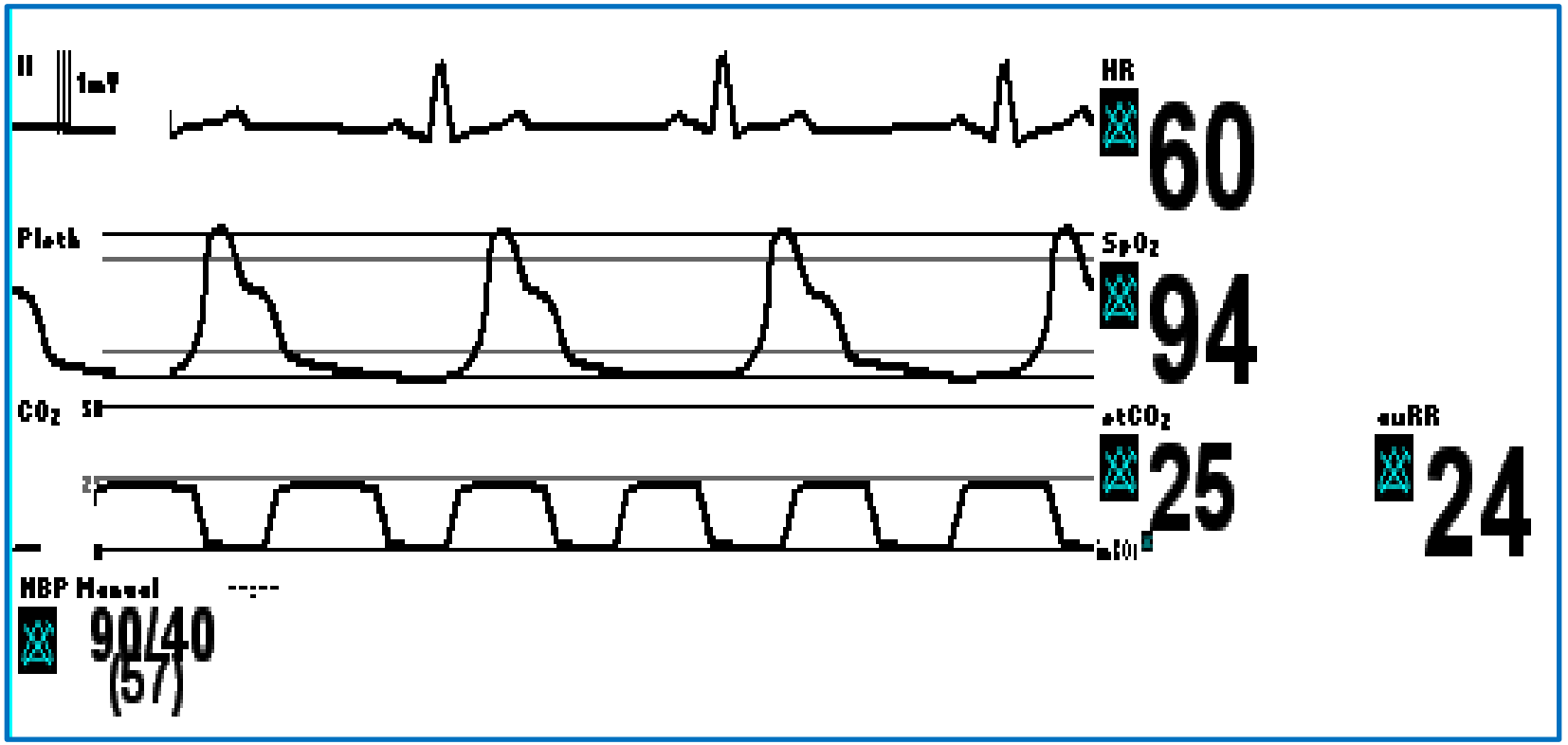
Extremities: ***Arms:*** Significant abrasions of hands, elbows and a few abrasions on the forearms, ***Legs***: Obvious compound fracture of the left mid-femur, bleeding controlled, distal leg is pale, ***Pulseless***, ***Motor*** and ***Sensory:*** Absent, significant abrasions of the right knee and shin, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injury or pain noted except to posterior of the left femur

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 24, **HR:** 60, **B/P:** 90/40 mmHg **LOC:** Eyes open to verbal, ***Pupils:*** 3 mm equal and reactive, ***Sensory****:* Intact except below left femur fracture, ***Motor****:* Intact except below left femur fracture, **$ETCO_2$:** 25 mmHg **SPO_2:** 94% **GCS**: 4/3/6 = 13	**What priority is this patient?** Critical/ High Priority **What signs cause concerns about the development of shock?** Decreasing GCS (13 → 10), increasing capillary refill time and changes in skin presentation. (Obj. 18.3, Page 351) **What interventions should be done and when?** SMR, airway maintenance, ventilation and oxygenation should be managed when identified. The patient is a load-and-go. (Obj. 18.4, Page 355) **What additional steps should take place when conducting SMR on a geriatric patient?** Provide extra padding in void areas cause by kyphosis or forward head position. (Obj. 18.4, Page 356)	**Oxygen therapy:** What liter flow should be used? Bag mask or 100% high flow O_2 at 12 - 15 liters/minute, maintain 95% O_2 saturation (Obj. 10.7, Page 205) **IV initiation:** Initiate IVs en route **What factors should be considered when providing fluid therapy to the geriatric patient?** The potential for decreased cardiac output, increased peripheral vascular resistance, decreased lung and renal function. (Obj. 18.4, Page 350, 351)	**Blood pressure:** 90/50 mmHg **Pulses:** 50 (weak radial) **RR:** 24, regular, and shallow **Skin:** Pale, cool, and moist **Capillary Refill:** 3 seconds **LOC:** Patient unresponsive, ***Pupils:*** Right pupil 6 mm; left pupil 5 mm, reactive, ***Pulse, Sensory*** and ***Motor:*** Intact except for the left distal leg, **$ETCO_2$:** 24 mmHg **SPO_2:** 92% **ECG -** Sinus bradycardia **GCS**: 1/2/5 = 8 **Blood Glucose:** 90 mg/dl (5.0 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
How can a geriatric patient's medications complicate assessment? Beta blockers can inhibit the heart's ability to increase the rate of contraction even in hypovolemic shock and pain. Behavioral medications may depress mental status, making head injury assessment a challenge. (Obj. 18.2, Page 352)	**What sign increases the acuity of this call besides the decreased LOC/head trauma?** The lack of pulse, motor and sensory below the left femur fracture. (Obj. 14.1, Page 271)	**What level should the $ETCO_2$ be maintained for this patient?** Goal is 35 – 45 mmHg. There is no evidence of raised ICP present. (Obj. 10.8, Page 205)	**Why is it important to obtain a blood glucose level from this patient?** Decreased blood sugar may have caused her to collapse into the path of the car. (Obj. 18.3, Page 351)

ADDITIONAL QUESTIONS

1. **What challenges may make it difficult to manage the airway of a geriatric patient?** Dentures, caps and bridges can create airway obstructions. Decreased movement of the mandible and neck make it difficult to gain access to the airway.
2. **Why is it important to establish the geriatric patient's normal mental status?** Age-related changes in mental status and neurological function may make it difficult to perform an accurate assessment and develop an appropriate treatment plan.
3. **What concern does changes in geriatric thermoregulation cause?** An age-related decrease in the ability to manage thermoregulation may cause the patient to become hypothermic sooner than a younger adult in the same circumstances.
4. **What consideration should be given to geriatric pain management?** Decreased renal function may increase sensitivity to drugs, causing over-sedation. Decrease dose.



SETTING

EMS/Pre-hospital: ALS and BLS partners are dispatched to a male motorcyclist struck by a large delivery van (lorry) at an approximate speed of 65 mph (100 kph). The cyclist was not wearing a helmet and was thrown off his bike, landing on a metal crash barrier in the middle of the highway (motorway). The fire department (fire brigade) is arriving at the same time as the ambulance.

Occupational Health/Industrial: An Occupational Health and Safety (OH&S) Team has been called to an internal road leading to a staff car park zone. A worker who was late for his shift was travelling by motor bike without a helmet. While negotiating a sharp bend, he collided with an oncoming SUV and was thrown off his bike landing on a metal barrier. EMS and Fire are arriving just behind the OH&S Team.

LEARNING OBJECTIVES

The learner will be able to:

- Describe potential hazards on the scene and how to mitigate them.
- Identify primary traumatic brain injury and the development of secondary brain injury.
- Describe the proper evaluation and prehospital management of the head-injured patient with associated multi-system trauma.
- Demonstrate treatment of an open chest wound.

KEY POINTS

1. Emphasize the importance of teamwork in the structured assessment and stabilization of the patient.
2. Reinforce assessment of the head-injured patient should be directed toward the recognition of primary brain injury and prevention of secondary injury prior to arrival in a facility where imaging and definitive care can be offered.
3. Emphasize the importance of maintaining optimal perfusion of the brain to prevent hypoxic brain injury which may be irreversible and permanent. Include the following:
    a. What cerebral herniation syndrome does to perfusion.
    b. How hyperventilation and osmotic diuretics buy time in cerebral herniation syndrome.

HISTORY

S Patient is initially responsive, confused, then decreased level of consciousness
A Unknown
M Unknown
P Unknown
L Unknown
E As described in the setting

INJURIES

1. Laceration to right fronto-parietal area. Raccoon eyes. Bleeding from both nostrils.
2. Unstable pelvis.
3. Closed fracture to right femur.
4. Bilateral deep anterior chest lacerations.
5. Open pneumothorax left chest.
6. Deformed right wrist.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize the significance of the mechanism of injury and load and go
- C-spine stabilization and spinal motion restriction with pelvic binding
- Recognize late signs of compensated shock
- Maintain a patent airway, ventilate and oxygenate as needed
- Place occlusive dressing or flutter valve over open chest wound
- Chest decompression if required
- Implement capnography
- Initiate fluid therapy in transit

PATIENT INSTRUCTIONS

A manikin can be used for this case. If using live patient, he should be responsive for the first 5 minutes and then has altered level of consciousness.

MOULAGE

Lacerations to scalp and anterior chest, sucking chest wound, deformity to right femur, bruising to right wrist, pale

HEAD INJURY 1P-5

SCENE SIZE-UP: One patient and scene is secured from traffic. Motorcyclist struck from behind by vehicle and thrown at highway speed.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is lying on the ground supine, complaining of pain. There is a bleeding right-sided scalp wound. The patient's white t-shirt is stained with blood bilaterally. **Life-Threatening Bleeding:** No

LOC: (with initial c-spine stabilization) Awake and complaining of pain from right thigh

AIRWAY: Patent

BREATHING: Rapid, irregular, and shallow

Ventilation instructions: Direct team to provide high-flow oxygen at 12-15 LPM by non-rebreathing mask

CIRCULATION:

Pulse: Weak, regular, and rapid with a thready left radial pulse

Bleeding: From scalp and anterior chest

Capillary Refill: 4 seconds

Skin: Pale, cold and clammy

WHAT SHOULD BE SUSPECTED BASED ON THE PATIENT'S PULSE, CAPILLARY REFILL AND SKIN?

The patient is in the late stages of compensated shock (Obj: 8.1, Page 156)

RAPID TRAUMA SURVEY

Head: 5-inch (13 cm) right parieto-frontal laceration with the skull visible

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Bilateral 4-inch (10 cm) lacerations to anterior inframammary areas. Moderate bleeding with air bubbling from wound and decreased chest motion on left side, ***Listen***: Clear breath sounds on right side; decreased breath sounds on left side, ***Feel***: Crepitus on left side, ***Percussion:*** Hyperresonance on the left side, ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries noted, soft and non-tender

Pelvis: Pain on assessing- compressing pelvis medially, unstable

Extremities: ***Legs***: Swelling and pain in right thigh, no visible wound, ***left leg***: No pain or injury noted, ***Arms:*** Contusions and deformed right wrist; ***left arm***: no pain or injuries noted, ***Extremities: Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injury or pain noted except to posterior of the right femur

History: Unable to obtain from patient

REASSESSMENT

Subjective Changes: None

LOC: Patient becomes very quiet with eyes closed

Pupils: Right side 5 mm, sluggishly reactive, left side 3 mm, reactive

GCS: 3/3/4 = 10

Airway: Noisy breathing

Breathing: Rapid, irregular, and shallow

Circulation: ***Blood pressure*****:** 90/50 mmHg, ***Pulses:*** 120, weak, and regular (radial), ***Skin:*** Cyanotic, cool and clammy, ***Capillary Refill:*** 4 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM

Head: 5-inch (13 cm) right parieto-frontal laceration with the skull visible (consider potential for secondary brain injury and cerebral herniation syndrome)

Chest: ***Look:*** Bilateral 4-inch lacerations to anterior inframammary areas. Moderate bleeding with air bubbling from wound and decreased chest motion on left side, ***Listen:*** Clear breath sounds on right side; decreased breath sounds on left side, ***Feel:*** Crepitus on right side, ***Percussion:*** Decreased resonance on the right side

Pelvis: Unstable

Right Leg: Swelling and pain in right thigh, no visible wound, ***Pulse, Motor*** and ***Sensory:*** Intact

SECONDARY SURVEY

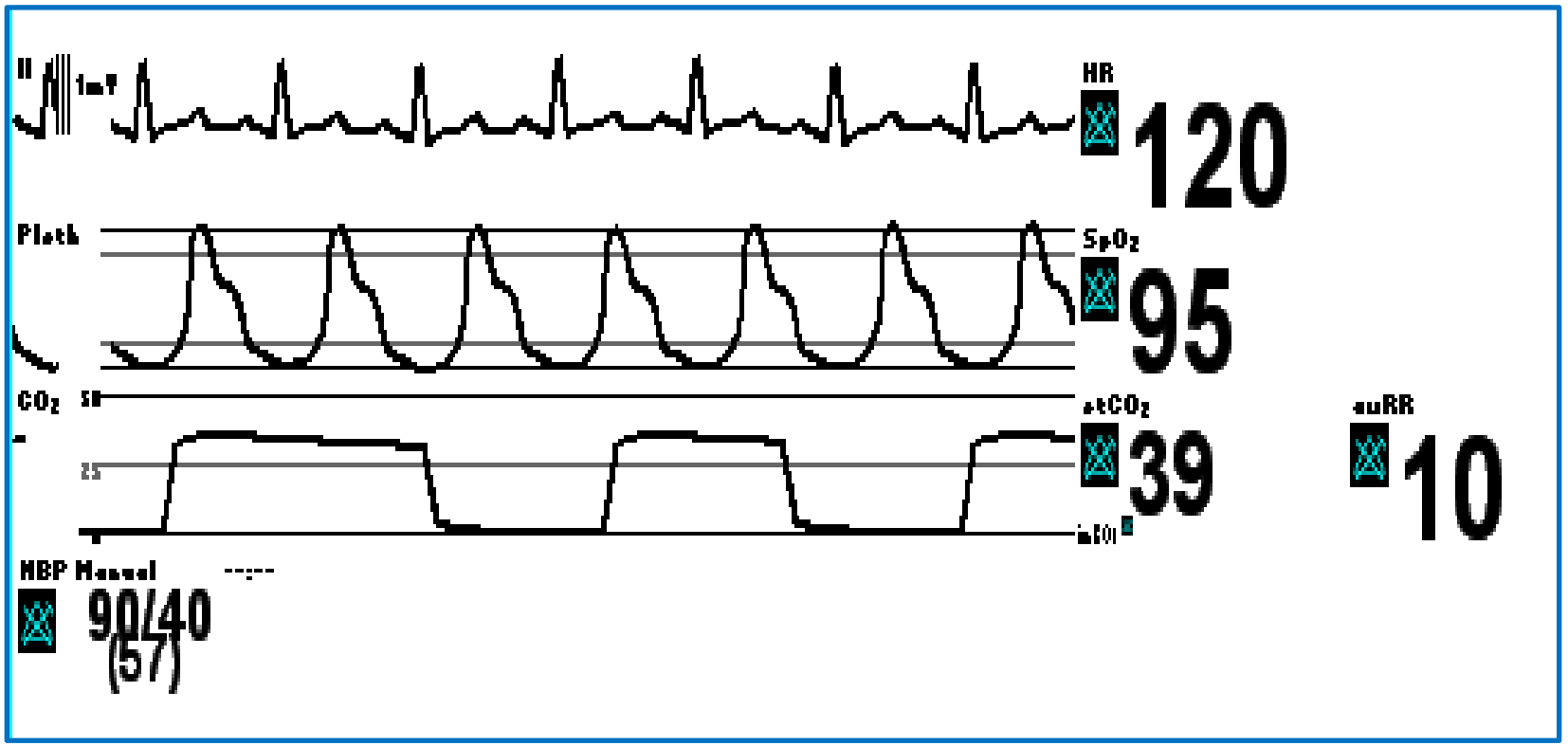
Deferred to during transport due to continuous need for Reassessment

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 24, **HR:** 120, **B/P:** 90/40 mmHg **LOC:** Eyes open to verbal, ***Pupils:*** 5 mm equal and reactive, ***Sensory*** *and* ***Motor****:* Intact **$ETCO_2$:** 39 mmHg **SPO_2:** 95% **GCS**: 4/4/6 = 14	**What priority is this patient?** Critical/ High Priority **Where should this patient be transported to?** Trauma Center **Should alternative transport be provided?** Consider aeromedical transport **What interventions should be done and when?** Spinal motion restriction, airway maintenance and ventilation and potentially needle decompression should be managed when identified (Obj. 2.3, Page 40) **What position should the patient be placed in?** Position the patients with 30-degree head elevation to assist with venous drainage (Obj. 10.7, Page 205)	**Airway/Breathing:** Airway adjunct and manual ventilation if required **Place occlusive dressing or flutter valve over wound** (Obj. 6.5, Page 132) **Oxygen therapy:** What liter flow should be used? 100% high flow O2 at 12 - 15 liters/minute, maintain 95% O_2 saturation (Obj. 10.7, Page 205) **IV initiation:** Start IVs en route **How much fluid should be administered?** The goal of fluid therapy should be to maintain systolic blood pressure at 110 to 120 mmHg in TBI. Avoid hypotension. (Obj. 10.6, Page 204) **SMR** including pelvic binding (Obj. 14.5, Page, 280)	**Blood pressure:** 90/50 mmHg **Pulses:** 120 (weak radial) **RR:** 10, irregular, and adequate tidal volume **Skin:** Cyanotic, cold and clammy **Capillary Refill:** 4 seconds **LOC:** Patient unresponsive, ***Pupils:*** Right side 5 mm, sluggishly reactive. Left side 3 mm, reactive, ***Pulse, Sensory*** and ***Motor:*** Intact, **$ETCO_2$:** 39 mmHg **SPO_2:** 95% **ECG:** Sinus tachycardia **GCS:** 3/3/3 = 9 **Blood Glucose:** 130 mg/dl (7.2 mmol/L)

TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
What injuries may be associated with the findings to the head? Linear or depressed skull fractures, lacerations, bleeding or fluid from the nose or ears. **(**Obj. 10.5, Page 201) **What is the significance of the moderate bleeding with air bubbling and decreased chest motion on left side?** The presence of an open pneumothorax, broken ribs or flail chest. (Obj. 6.5, Page 135)	**Are these findings consistent with the working impression/diagnosis of this patient?** Decreasing level of consciousness, and unequal pupils in the presence of a head injury may indicate TBI. (Obj. 10.7, Page 201 - 204) **Could the injuries to the head worsen?** Increased intracranial pressure could lead to anoxic brain injury and herniation. (Obj. 10.7, Page 194)	**What rate should you ventilate the patient?** 8 – 10 breaths/minute. **What level should the $EtCO_2$ be maintained?** 35 – 45 mmHg, or 30 – 35 mmHg if increased ICP is evident. (Obj. 10.8, Page 205)	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** Patients with suspected traumatic brain injury are load and go. A Secondary Survey may not be performed due to critical interventions/care required during transport. (Obj. 10.5, Page 204)

ADDITIONAL QUESTIONS

1. **What challenge does the patient's chest injuries present in managing a traumatic brain injury?** The chest injuries significantly increase the difficulty in brain oxygenation.
2. **What ominous change develops between the Rapid Trauma Survey and Reassessment?** The patient closes his eyes and becomes very quiet.
3. **Explain the Monroe-Kellie Doctrine.** The contents of the skull (brain, blood and CSF) are at a fixed volume. An increase in the volume of one is compensated by a decrease in the other two.
4. **What are the indications for performing a chest decompression?** The presence of a tension pneumothorax with decompensation evidenced by respiratory distress and cyanosis, signs of shock, or a decreasing level of consciousness.



SETTING

EMS/Pre-hospital: Called to the scene of an altercation between two young men. The patient was hit and kicked during the fight, which caused him to fall backward and hit the back of his head.

Occupational Health/Industrial: Same as EMS/Pre-hospital.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat life-threatening head injuries.
- Identify the major signs and symptoms of head injury.
- Discuss the pathophysiology and management of an epidural hematoma.
- Describe Cushing's Triad.

KEY POINTS

1. Reinforce what the adverse effects of hypoventilation and hyperventilation are in the head-injured patient.
2. Highlight Cushing's reflex (increased blood pressure, decreased pulse).
3. Stress what the recommended minimum systolic BP (110 mmHg) is for the adult traumatic brain injury patient with GCS < 8.
4. Stress why barbiturates should not be administered as a sedative for the head-injured patient as they cause a decrease in systemic BP.
5. Reinforce how the Monroe-Kelli Doctrine affects secondary brain injury.

HISTORY

S Brief loss of consciousness at time of injury
A Unknown
M Unknown
P Unremarkable
L Two hours ago
E As described in the setting

INJURIES

1. Closed major head injury.
2. Facial injuries and edema.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Initial c-spine stabilization.
- High-flow O_2 via non-rebreather mask at 12-15 liters/minute, maintain O_2 saturation at 95%.
- Recognize load and go.
- Recognize decreasing level of consciousness, respiratory rate, non-patent airway, pupil changes.
- Maintain airway through an airway adjunct or intubation.
- Ventilate with bag-valve mask.
- Recognize Cushing's Triad.
- Monitor $ETCO_2$ and maintain between 30-35 mmHg.
- Initiate fluid therapy during transport. Maintain systolic blood pressure at 110 - 120 mmHg. Avoid hypotension.

PATIENT INSTRUCTIONS

The patient is initially confused, then becomes rapidly unconscious as they are loaded into the ambulance.

MOULAGE

Patient has bruising to the face and a hematoma to the occipital area.

HEAD INJURY 1P-6

SCENE SIZE-UP: one patient and scene is safe. Police have secured the scene and the perpetrator. The patient was assaulted with fists and feet. The patient fell backward and hit his head.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Young male, lying on the ground, with obvious facial swelling and contusions. **Life-Threatening Bleeding:** No.

LOC: (with initial c-spine stabilization) Confused, but vocalizing

AIRWAY: Patent

BREATHING: Regular with adequate rate and tidal volume

Ventilation instructions: Apply oxygen by non-rebreather mask

CIRCULATION:

Pulse: Strong, regular, with an adequate rate (radial)

Bleeding: Small oozing from hematoma on the occiput; small oozing from facial swelling and injuries

Capillary Refill: <2 seconds

Skin: Pale, warm and dry

WHAT IS THE INITIAL ASSESSMENT PURPOSE?

To prioritize the patient and to identify immediately life-threatening conditions (Obj. 2.3, Page 34)

RAPID TRAUMA SURVEY

Head: Significant facial swelling with laceration on the corner of the right eye. Hematoma felt over the occipital region.

Neck: Tender*,* ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No injuries noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No injuries or pain noted, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries noted, soft and non-tender

Pelvis: Stable, no injuries or pain noted

Extremities: ***Legs and Arms***: No injuries or pain noted,
Pulse, Motor and ***Sensory:*** Intact

Posterior: Hematoma on the occiput, no other findings

History: Unable to obtain, as patient becomes suddenly unresponsive

REASSESSMENT

Subjective changes: Patient becomes less responsive

LOC: Eyes open to pain

Pupils: Right pupil 5 mm and sluggish; left pupil 3 mm and brisk

GCS: 1/1/3=5

Airway: No gag reflex/non-patent

Breathing: RR drops to 10/minute and becomes irregular. Patient should be intubated or have an airway adjunct inserted, bag mask ventilation

Circulation: ***Blood pressure*****:** 150/105 mmHg, ***Pulses:*** 50 (radial), ***Skin:*** Pale, warm and dry, ***Capillary Refill:*** <2 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified injuries: No changes

FOCUSED EXAM

Head: Significant facial swelling with laceration on the corner of the right eye

Scalp: Occipital hematoma

SECONDARY SURVEY

Head: Significant facial swelling with laceration on the corner of the right eye; hematoma on occipital area

Airway: Maintained with airway adjunct

Breathing: Patient should be hyperventilated with BVM

Neck: No changes, ***Trachea*****:** Midline, ***Neck veins****:* Flat

Chest: ***Look:*** No injuries noted, ***Listen:*** Clear and equal, no abnormal breath sounds**, Feel:** No injuries or pain noted, **Percussion:** Resonant

Abdomen: No changes

Pelvis: No changes

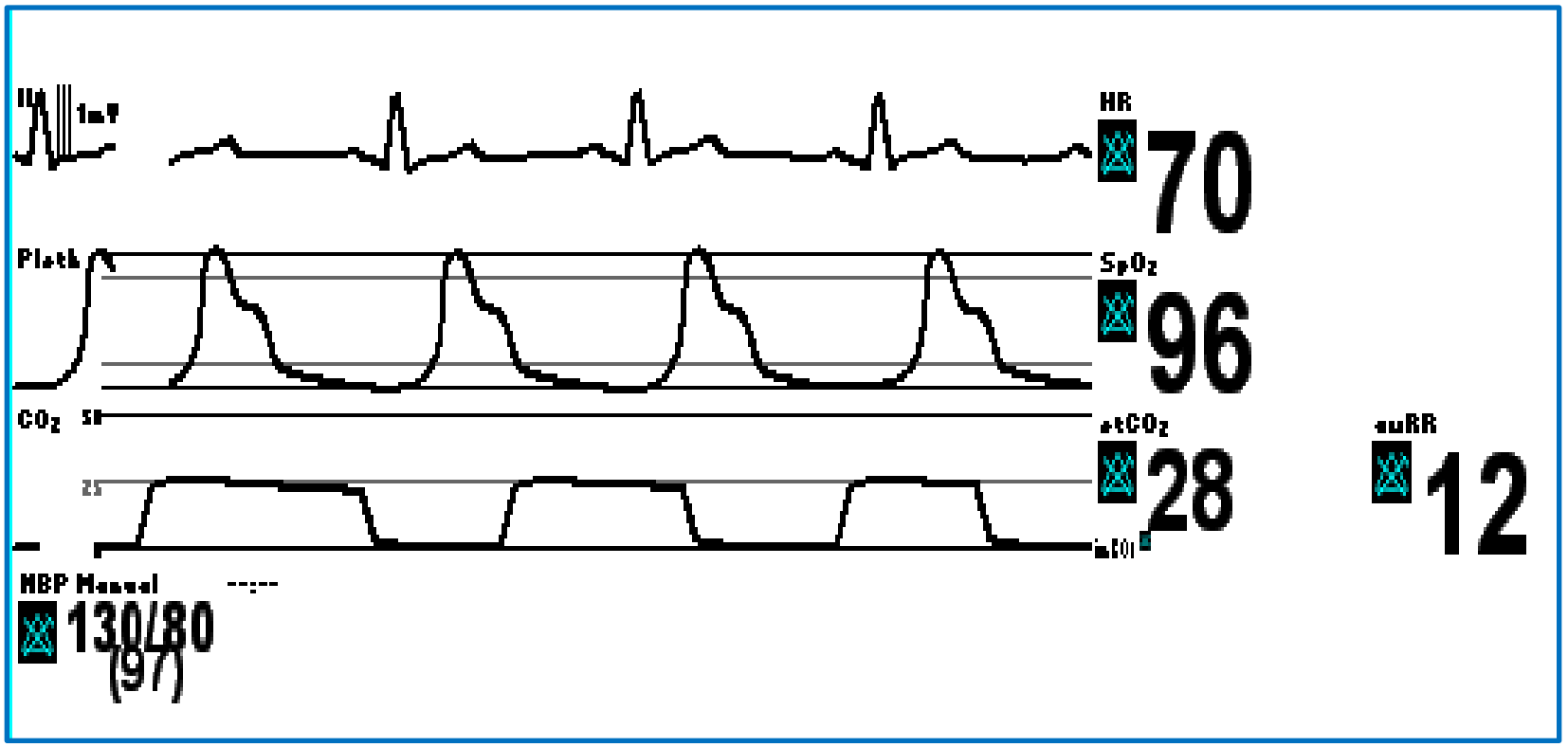
Extremities: No changes

Posterior: No changes

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 12, **HR:** 70, **B/P:** 130/80 mmHg **LOC:** Eyes open to pain, ***Pupils:*** 3 mm equal and reactive, ***Sensory****:* Groans to pain, ***Motor****:* Localizes pain, **$ETCO_2$:** 28 mmHg **SPO_2:** 96% **GCS**: 2/2/5 = 9 **Should you delay scene time to obtain an accurate blood pressure?** Vital signs for this patient should be taken during transport. (Obj. 2.5, Page 39)	**What priority is this patient?** Critical/ High Priority **Where should this patient be transported to?** Trauma Center **Should alternative transport be provided?** Consider aeromedical transport. **Should you delay scene time to obtain an accurate blood pressure?** Vital signs for this patient should be taken during transport. (Obj. 2.5, Page 39) **What position should the patient be placed in?** Position the patients with 30-degree head elevation to assist with venous drainage. (Obj. 10.7, Page 205)	**Airway/Breathing:** Airway adjunct and bag mask ventilation at RR at 20 **Oxygen therapy:** What liter flow should be used? 100% high-flow O_2 at 12-15 liters/minute, maintain 95% O_2 saturation (Obj. 10.7, Page 205) **IV initiation:** Start IVs en route **How much fluid should be administered?** The goal of fluid therapy should be to maintain systolic blood pressure at 110 to 120 mmHg in TBI. Avoid hypotension. (Obj. 10.6, Page 204)	**Blood pressure:** 170/105 mmHg **Pulses:** 50 (radial) **RR:** 20 (BVM) **Skin:** Pale, warm and dry **Capillary Refill:** <2 seconds **LOC:** Patient unresponsive, ***Pupils:*** Right pupil fixed and dilated; left pupil 4 and sluggish, ***Sensory*** and ***Motor:*** No response **$ETCO_2$:** 28 mmHg **SPO_2:** 96% **ECG:** Sinus bradycardia **GCS:** 1/1/1=3 **Blood Glucose:** 160 mg/dl (8.9 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
What injuries may be associated with the findings to the head? Skull fractures or depressions, lacerations, bleeding or fluid from the nose or ears. (Obj. 10.5, Page 201) **Could the injuries to the head worsen?** Increased cerebral pressure could lead to anoxic brain injury and herniation. (Obj. 10.7, Page 194)	**Are these findings consistent with the working impression/diagnosis of this patient?** Decreasing level of consciousness, loss of gag reflex, increasing blood pressure with widening pulse pressure and developing bradycardia are consistent with Traumatic Brain Injury. (Obj. 10.7, Page 201 - 204)	**What rate should you ventilate the patient?** 8-10 breaths/minute. **What level should the ETCO2 be maintained?** 35-45 mmHg, or 30-35 mmHg if raised ICP is evident. (Obj. 10.8, Page 205)	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** Suspected TBI patients are load and go. A Secondary Survey may not be performed due to critical interventions/care required during transport. (Obj. 10.5, Page 204)

ADDITIONAL QUESTIONS

1. **The primary job of a provider treating a patient with a Traumatic Brain Injury is?** Prevent secondary injury**.**
2. **What is the significance of posturing in a head injury patient?** Ominous signs of deep cerebral hemispheric or upper brain stem injury.
3. **What are the differences in decorticate and decerebrate posturing?** Decerebrate is worse and signifies cerebral herniation.
4. **What are some critical interventions for patients with head injuries?** Rapid assessment and recognition of potential injury; rapid, safe transport to an appropriate hospital; secure the airway and provide good oxygenation with pulse oximeter maintained at a level of 95%; try to keep $ETCO_2$ between 35-45 mmHg; if hyperventilation is needed, maintain $ETCO_2$ between 30-35 mmHg; apply spinal motion restriction based on the mechanism of injury; consider sedation for combative patients to reduce ICP; IV lines and maintain systolic BP between 110-120 mmHg.



SETTING

EMS/Pre-hospital: The patient is a passenger in a two-car collision at an intersection. The vehicle was struck broadside to the right passenger door at 30 mph (50 kph). The patient was restrained and removed from the vehicle by bystanders. The restrained driver was unhurt.

**Note: If the vehicle is driven from the right side (e.g., UK) injuries to the passenger will be on the patient's left*.

Occupational Health/Industrial: The patient is an employee at a commercial warehouse struck by a fork lift. The hi-lo struck the patient on the right side. The patient was was knocked to the ground but not run over.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat life-threatening injuries.
- Identify the major signs and symptoms of hypovolemic shock.
- State what injuries can lead to hypovolemic shock.

KEY POINTS

- Emphasize load and go conditions.
- Reinforce the amount of potential blood loss from fractures.
- Stress the importance of anticipating deterioration from torso trauma.

HISTORY

S Multiple blunt force trauma
A None
M Unknown
P Unknown
L Unknown
E As described in the setting

INJURIES

1. Right facial lacerations and abrasions.
2. Right lateral chest wall contusion.
3. Right blunt abdominal trauma.
4. Pelvic fracture.
5. Right femur fracture.
6. Right humerus fracture.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Initial c-spine stabilization.
- Assist ventilations with bag-valve mask and hi-flow O_2 at 12–15 liters/minute.
- Recognize load and go.
- Bind pelvis.
- Apply Spinal Motion Restriction.
- Recognize shock.
- Perform blood glucose.
- Initiate fluid therapy in transport. Titrate fluid to maintain LOC in a non-TBI patient, or to maintain a radial pulse if bleeding is controlled.

PATIENT INSTRUCTIONS

Patient responds slowly and is weak. Patient complains of shortness of breath and pain to right chest wall. He/she complains of pain when any of the injuries are palpated. Patient should act confused and dazed. Patient's consciousness may decrease as shock develops.

MOULAGE

Pale, diaphoretic skin, facial lacerations, bruising to right lateral chest and abdomen. Deformity to right humerus and femur.

SHOCK 1P-7

SCENE SIZE-UP: One patient and scene is safe. Mechanism of injury: Blunt force trauma to right side (left side if vehicle is driven from the right).

INITIAL ASSESSMENT

GENERAL IMPRESSION: Complaining of pain to entire right side. Looks unwell, high priority. **Life-Threatening Bleeding:** No.

LOC: (with initial c-spine stabilization) Responds verbally; confused, dazed

AIRWAY: Patent

BREATHING: Rapid, shallow, and labored

Ventilation instructions: Assist ventilations with bag-mask

CIRCULATION:

Pulse: Rapid, weak and regular (carotid, no radial pulse)

Bleeding: Small oozing from facial injuries

Capillary Refill: 4 seconds

Skin: Pale, cool and moist

SHOULD VITAL SIGNS FOR THIS PATIENT BE DELEGATED AFTER THE INITIAL ASSESSMENT?

Vital signs for this patient should be taken during transport. (Obj: 2.5, Page 39)

RAPID TRAUMA SURVEY

Head: Facial lacerations and abrasions, bleeding controlled

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: Pain in right chest wall, ***Look:*** Bruises to right lateral chest with equal chest rise, ***Listen:*** Clear and equal, no abnormal breath sounds ***Feel***: Crepitus, ***Percussion***: Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Pain in upper right abdomen

Pelvis: Unstable with crepitus on the right

Extremities: ***Legs:*** Right femur fracture, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Arms***: Pain, deformity to right humerus, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injuries or pain noted

History: (Obtain from patient)

REASSESSMENT

Subjective Changes: No changes

LOC: Responds verbally, confused, dazed

Pupils: 4 mm, equal and reactive

GCS: 3/4/4=11

Airway: Patent

Breathing: RR 40, shallow, and labored

Circulation: ***Blood pressure:*** 74/40 mmHg (without fluid resuscitation; 80/60 mmHg with fluid resuscitation), ***Pulses:*** 130, weak and regular (carotid, no radial pulse), ***Skin:*** Pale, moist and cool, ***Capillary Refill:*** 4 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: Pain in right ribs, ***Look***: Bruises to right lateral chest with equal chest rise, ***Feel***: Crepitus, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Percussion***: Resonant

Abdomen: No changes

Identified Injuries: Extremities: ***Arms***: Pain, deformity right humerus, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Legs:*** Right femur fracture, ***Pulse, Motor*** and ***Sensory:*** Intact after splinting

FOCUSED EXAM

Head: Facial lacerations and abrasions

Chest: Rib fractures

Abdomen: Right blunt abdominal trauma

Pelvis: Pelvic fracture

Lower Extremities: Right femur fracture and right humerus fracture

SECONDARY SURVEY

Head: Right facial lacerations and abrasions; bleeding controlled

Airway: Patent

Breathing: Rapid, shallow, and labored

Circulation: Rapid, weak and regular (radial)

Skin: Pale, cool, and moist

Neck: No changes, ***Trachea***: Midline, ***Neck veins:*** Flat

Chest: Pain in right ribs, ***Look***: Bruises to right lateral chest with equal chest rise, ***Feel:*** Crepitus, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Percussion:*** Resonant

Abdomen: Bruising and tenderness

Pelvis: Unstable

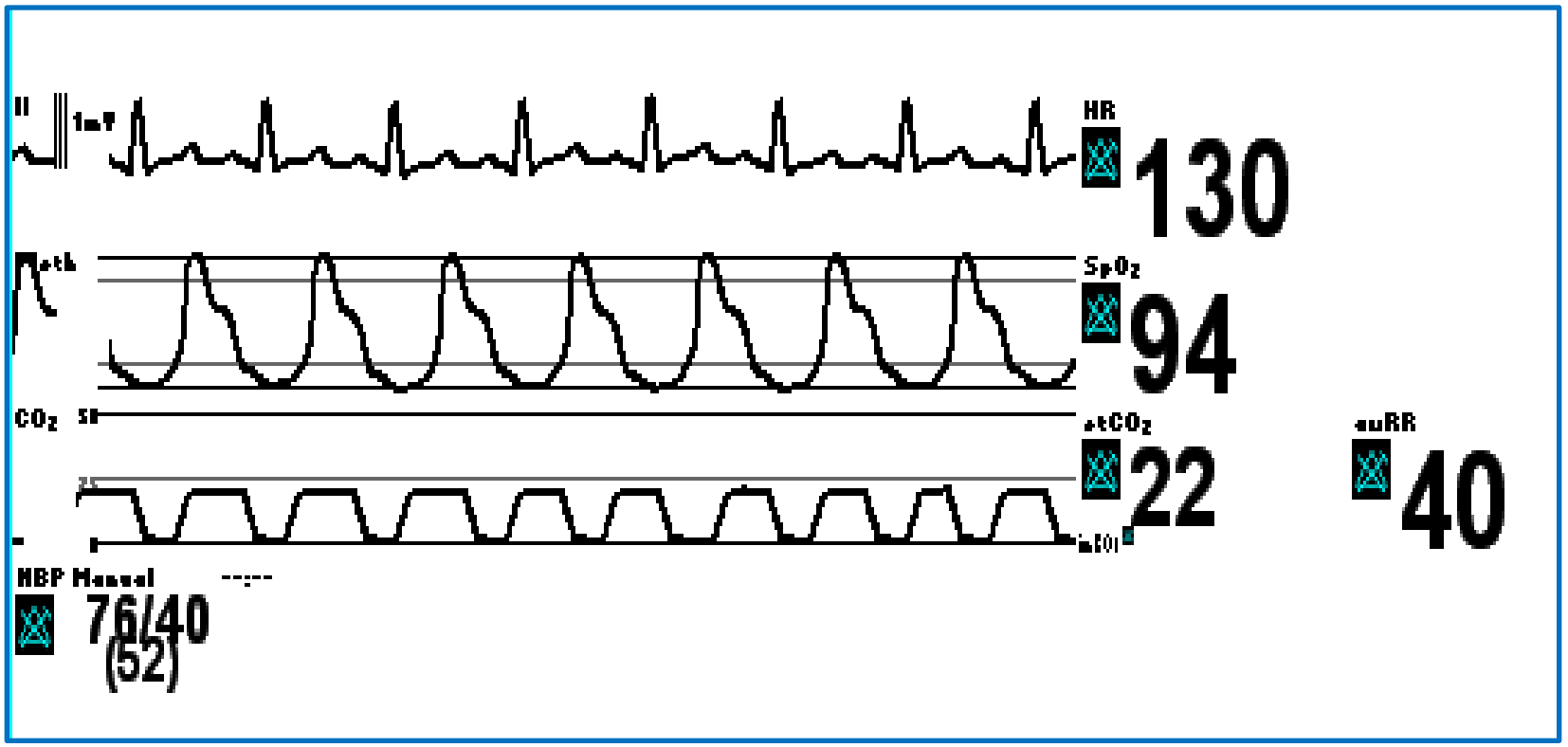
Extremities: ***Arms***: Pain, deformity right humerus, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Legs:*** Right femur fracture, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No changes

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITAL SIGNS & NEUROLOGICAL
RR: 40, **HR:** 130, **B/P:** 76/40 mmHg **LOC:** Responds verbally, confused, dazed ***Pupils:*** 3 mm, equal and reactive, ***Sensory****:* Intact, ***Motor****:* Intact, **$ETCO_2$:** 22 mmHg **SPO_2:** 94% **GCS***:* 3/4/4 = 11 **Blood Glucose**: 124 mg/dl (8.9mmol/L)	**What priority is this patient?** Critical/ high priority **Where should this patient be transported to?** The nearest appropriate emergency facility **Should alternative transport be provided?** Aeromedical transport may be considered based on transport factors **What interventions should be done on scene?** Control the airway, ventilate, oxygenate, Spinal Motion Restriction. (Obj. 2.6, Page 40)	**Oxygen therapy: What liter flow should be used?** 12 to 15 liters/minute and maintain O_2 saturation at 95% (Obj. 8.5 Page 166) **IV initiation:** BP 70/40 mmHg with no bolus; BP 90/60 mmHg with bolus **Pulses***:* 140 with no treatment; 130 with appropriate bolus **GCS:** 11 unless shock is not treated; GCS drops to 8 if no fluid therapy **Bind Pelvis:** if the pelvis is unstable	**BP**: 74/40 mmHg (no fluid resuscitation); 82/50 mmHg (with fluid resuscitation) **HR**: 130, weak and regular (carotid, no radial pulse) **RR:** 40, shallow, and labored **Skin:** Pale, moist, cool, delayed capillary refill **LOC:** Responds verbally, confused, dazed, ***Pupils:*** 3mm, equal and reactive, ***Sensory:*** Intact, ***Motor:*** Withdraws from pain, **$ETCO_2$:** 22 mmHg **SPO_2:** 94% **ECG:** Sinus tachycardia **GCS:** 3/4/4=11 **Blood Glucose:** 130 mg/dl (7.2 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
What type of shock is developing in this patient? Hypovolemic shock (Obj. 8.3, Page 160) **What injuries may be the source(s) of bleeding in this patient?** Blunt abdominal trauma, pelvic fracture and femur fracture (Obj. 13.6, Page 259)	**Are these findings consistent with the working impression/diagnosis of this patient?** Yes, rib fractures, blunt abdominal trauma, pelvic fracture, femur fracture and a humerus fracture all have the potential to cause significant blood loss (Obj. 13.6, Page 259) **What vital sign would be important for monitoring this patient?** Capnography (Obj. 8.5 Page.159)	**How much fluid should be administered?** Titrate fluid to maintain level of consciousness in a non-traumatic brain injury patient, or to maintain a radial pulse if bleeding is controlled (Obj. 8.7, Page 169) **What location would be preferred for an intraosseous access if needed?** Proximal humerus; the other locations are sub-diaphragmatic points of vascular access which may be compromised due to potential injuries identified in the assessment (Obj. 9.3, Page 179)	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** Assessment of pelvis. It shouldn't be checked again to prevent further trauma/ potential bleeding. (Obj. 2.3, Page 39)

ADDITIONAL QUESTIONS

1. **What are the most common causes of hypovolemic shock?** External bleeding, hemothorax, blunt abdominal trauma, pelvic fracture and bilateral femur fracture.
2. **Could intra-abdominal injuries be missed in patient with low level of consciousness or distracting injuries (painful femur fracture)?** Yes.
3. **What are some critical interventions for patients with abdominal injuries?** Rapid assessment and recognition of potential injury; rapid, safe transport to an appropriate hospital; IV lines; pelvic binding; consider TXA; Focused Assessment with Sonography in Trauma (FAST exam).
4. **What part of a neurological exam shouldn't you forget in the Rapid Trauma Survey on this patient as a part of the differential diagnosis?** Blood Glucose (Obj. 2.3. Page 39)



SETTING

EMS/Pre-hospital: An ambulance has been dispatched to an equestrian event where a horse has thrown its rider when it refused to jump a fence. The patient is lying in the arena next to the fence.

Occupational Health/Industrial: An ambulance has been dispatched to the factory floor where a patient was hit by a fork lift.

LEARNING OBJECTIVES

The learner will be able to:

- Perform the management of controllable hemorrhage.
- Describe the management of uncontrolled hemorrhage.
- State the signs and symptoms of shock in the order that they develop from compensated to uncompensated.

KEY POINTS

1. Emphasize the importance of teamwork in the structured assessment and stabilization of the patient.
2. Reinforce the recognition of controlled and uncontrolled hemorrhage directs the management of the patients.
3. Stress how to recognize compensated and decompensated shock.

HISTORY

S Leg is bleeding
A None
M None
P None
L One hour ago
E As described in the setting

INJURIES

1. Open wound to left femur, arterial bleed.
2. Left femur fracture.
3. Hypovolemic shock.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize life-threatening bleeding.
- Delegate tourniquet application.
- Recognize load and go.
- Reassess deadly bleeding after Rapid Trauma Survey.
- Delegate high-flow O_2 application.
- Recognize low volume shock.
- Recognize decreased level of consciousness.
- Establish fluid therapy during transport and titrate to maintain level of consciousness.
- Consider hemostatic agent if tourniquet does not control bleeding.
- Consider aeromedical transport.

PATIENT INSTRUCTIONS

Complaining of pain and bleeding from the left leg. No loss of consciousness.

MOULAGE

Arterial bleeding from an open left femur. Pale and diaphoretic.

SHOCK 1P-8

SCENE SIZE-UP: One patient and scene is safe. Mechanism of injury: Severe blunt force trauma to the left femur.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Patient is lying supine on the ground, with a large pool of blood around the left femur, and active bleeding from the wound

Life-Threatening Bleeding: Yes.

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Elevated, regular, adequate tidal volume

Ventilation instructions: Direct team to consider oxygen via non-rebreather mask

CIRCULATION:

Pulse: Rapid, weak, and regular (carotid, no radial pulses)

Bleeding: Arterial bleed from left femur wound

Capillary Refill: 4 seconds

Skin: Pale, cool, clammy

WHAT IS THE IMMEDIATE INTERVENTION REQUIRED FOR THIS PATIENT BASED ON THE INITITAL ASSESSMENT?

Control the arterial (life-threatening) bleed from the left femur (Obj: 3.1, Page 55)

RAPID TRAUMA SURVEY

Head: No injuries or pain noted

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No injuries noted, equal chest rise, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel***: No injuries or pain noted, ***Percussion***: Resonant ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries noted, soft and non-tender

Pelvis: Stable

Extremities: ***Legs: Upper Legs***: Open left femur fracture. (if no intervention and tourniquet applied, continues bleeding at a rate that results in death), ***Lower legs:*** No injuries or pain noted, ***Arms:*** No injuries or pain noted, ***Pulse***, ***Sensory*** and ***Motor***: Intact,
Pulse, Sensory and ***Motor***: Intact

Posterior: No injuries or pain noted

History: (Obtain from patient)

REASSESSMENT

Subjective Changes: Left femur bleeding controlled with tourniquet. Patient will arrest if deadly bleed is not controlled.

LOC: Alert

Pupils: 4 mm, equal and reactive

GCS: 3/4/4 = 11 GCS

1/1/1 = 3 if tourniquet has not been applied.

Airway: Patent

Breathing: RR 20, regular, with adequate tidal volume

Circulation: BP: 74/40 mmHg (if no fluid resuscitation; 80/60 mmHg if fluid resuscitation) **Pulses**: 130, regular, and weak (radial) **Skin**: Pale, moist and clammy

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified injuries: ***Lower Legs***: Open fracture left femur with bleeding controlled, ***Upper Legs***: No changes, ***Pulse, Sensory*** and ***Motor:*** Intact

FOCUSED EXAM

Lower Extremities: Open left femur fracture

SECONDARY SURVEY

Head: No changes

Airway: No changes

Breathing: RR 20, regular, with adequate tidal volume

Neck: No changes, ***Trachea*****:** Midline, ***Neck veins****:* Flat

Chest: ***Look***: No changes, ***Listen:*** No changes, ***Feeling***: No changes, ***Percussion:*** No changes

Abdomen: No changes

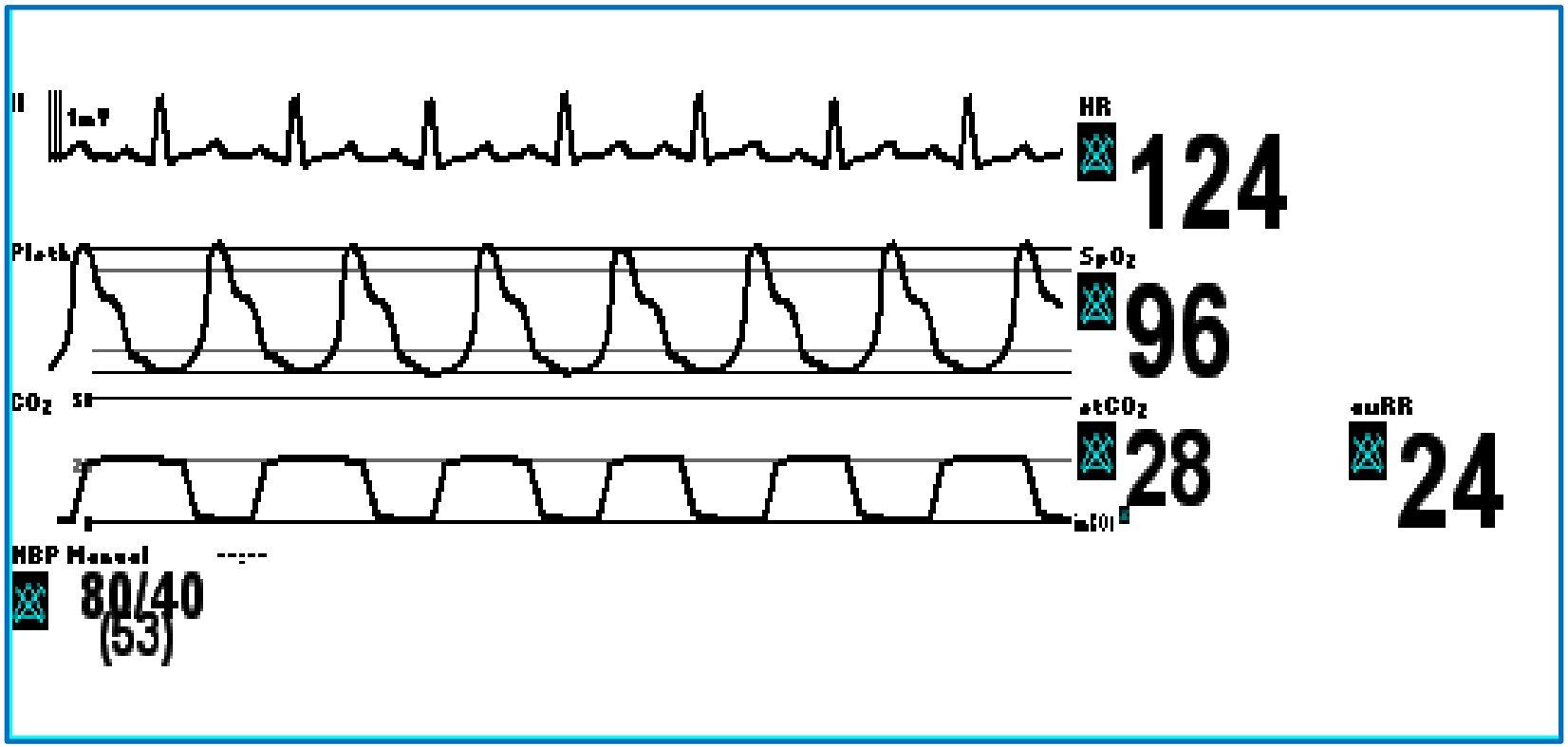
Pelvis: No changes

Extremities: ***Arms***: No changes, ***Legs: Lower Legs***: Open fracture left femur with bleeding controlled, ***Upper Legs***: No changes, ***Pulse, Sensory*** and ***Motor:*** Intact

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITAL SIGNS & NEUROLOGICAL
RR: 24, **HR:** 124, **B/P:** 80/40 mmHg **LOC:** Alert, ***Pupils:*** 4 mm, equal and reactive, ***Sensory:*** Intact, ***Motor:*** Cannot move left leg due to fracture, **$ETCO_2$:** 28 mmHg **SPO_2:** 96% **GCS**: 4/5/6 = 15	**What priority is this patient?** Critical **Where should this patient be transported to?** Trauma center **Should alternative transport be provided?** Consider aeromedical transport with long transport time **What interventions should be done and when?** Tourniquet as soon as uncontrollable bleed recognized (Obj. 2.6, Page 40) **What factors should you consider when deciding whether to do vitals en route or on scene?** Presence of radial pulse, critical patient, number of rescuers (Obj. 2.6, Page 40)	**Oxygen therapy: What liter flow should be used?** 12 to 15 liters/ minute and maintain O_2 saturation at 95% (Obj: 8.5 Page 166) **How much fluid should be administered?** 500-1000 mL until a normal BP is achieved **Why should this amount of IV fluid be given?** Controllable bleed. (Obj. 8.7, Page 167)	**BP**: 70/40 mmHg with no fluid; 90/40 mmHg with appropriate fluid bolus **HR**: 130, weak, and regular (carotid, no radial pulses) **Skin:** Pale, moist, cool, delayed capillary refill **LOC:** Confused, responds to voice, ***Pupils***: 4 mm, equal and reactive, ***Sensory:*** Intact, ***Motor:*** Cannot move left leg due to fracture **$ETCO_2$:** 28 mmHg **SPO_2:** 96% **ECG:** Sinus tachycardia **GCS:** 4/4/4=12, if shock recognized; 1/1/1= 3 if unrecognized **Blood Glucose:** 106 mg/dl (6.0 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
What critical intervention should be done as soon as it's identified? Treat uncontrollable bleeding (Obj. 25, Page 40) **If the tourniquet does not control the bleed, what additional treatments can be done?** Use hemostatic agent (Obj. 15.6, Page 300) **What type of shock is present?** Low volume shock (absolute hypovolemia) (Obj. 8.3, Page 160)	**Are these findings consistent with the working impression/diagnosis of this patient?** Yes, the sympathetic response, thready pulse, decreased level of consciousness, and a known deadly bleed indicate low-volume shock (Obj. 8.3, Page 160)	**Are any of these findings inconsistent with the working impression/diagnosis?** Yes, open femur fractures can bleed profusely if uncontrolled; a closed femur fracture can lose 1-2 liters of blood. (Obj. 14.4, Page 267-268)	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** As a rule, the Reassessment should be repeated prior to beginning a Secondary Survey. Critical patients get a Secondary Survey en route to the hospital if time permits. (Obj. 3.2.c, Page 60)

ADDITIONAL QUESTIONS

1. **What four things can interrupt a Rapid Trauma Survey?** Airway obstruction, cardiac arrest, severe hemorrhage, or the scene becomes too dangerous.
2. **Describe the management of uncontrolled hemorrhage:** Direct pressure, tourniquet, hemostatic agent.
3. **What stage of shock is the patient in?** Decompensated – known specifically because of the hypotension and altered mental status.
4. **What signs and symptoms indicate a patient deteriorating from compensated to decompensated shock?** Starting with signs of compensated shock (often in this order) – weakness and lightheadedness, pallor, tachycardia, diaphoresis, tachypnea, decreased urinary output, weakened peripheral pulses, thirst to decompensated – hypotension, altered mental status, cardiac arrest.



SETTING

EMS/Pre-hospital: You have been called to the scene of an assault. A male has been stabbed and struck with a tire iron/lever. The police tell you the scene is secure.

Occupational Health/Industrial: You have been called to the scene of a workplace violence incident. According to security, the scene is safe and the perpetrator is in custody. One worker has been stabbed and beaten with a pipe.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat life-threatening injuries.
- Identify the major signs and symptoms of thoracic trauma.
- Explain the pathophysiology and management of tension pneumothorax.
- Treat a closed fracture.

KEY POINTS

- Emphasize load and go conditions.
- Reinforce the effects a tension pneumothorax has on ventilation and circulation.
- Stress the importance of anticipating deterioration from life-threatening chest injuries.

HISTORY

S Shortness of breath
A Penicillin
M Effexor
P Depression
L 2 hours ago
E As described in the setting

INJURIES

1. Tension pneumothorax in right chest from a stab wound.
2. Closed left forearm fracture.
3. Shock.
4. Contusion left temporal

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize the significance of the mechanism of injury and load and go.
- Recognize ineffective respirations and assist ventilations immediately.
- Recognize late signs of compensated shock.
- Maintain a patent airway; ventilate and oxygenate as needed.
- Place occlusive dressing or flutter valve over open chest wound.
- Chest decompression if required.
- Implement capnography.
- Initiate fluid therapy in transit.

PATIENT INSTRUCTIONS

You should be alert and having difficulty breathing. Complain of pain when your right chest or your lower forearm is examined.

MOULAGE

Stab wound to right chest and bruises on the left forearm. Simulate shock. Contusion left temporal.

SCENE SIZE-UP: Security have the scene secured. Police and fire are on scene and can assist. There is one patient.

INITIAL ASSESSMENT

GENERAL IMPRESSION: Patient is lying prone, conscious, with obvious dyspnea.

Life-Threatening Bleeding: No

LOC: (Responsive to painful stimuli

AIRWAY: Patent

BREATHING: Rapid, shallow and gasping

Ventilation instructions: Direct team to assist ventilations

CIRCULATION:

Pulse: Weak, regular, and rapid radial pulse

Bleeding: Blood visible left anterior chest; no major external bleeding

Capillary Refill: 4 seconds

Skin: Cyanotic, cold and clammy

WHAT SHOULD BE SUSPECTED BASED ON THE PATIENT'S PULSE, CAPILLARY REFILL AND SKIN?

The patient is in the late stages of compensated shock (Obj. 8.1, Page 156)

RAPID TRAUMA SURVEY

Head: Contusions left temporal area

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Distended

Chest: ***Look:*** Open chest wound left anterior chest, ***Listen***: No breath sounds left side; normal heart tones, ***Feel***: No crepitus, ***Percussion:*** Hyperresonance on left side, ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries noted, soft and non-tender

Pelvis: No injuries or pain noted

Extremities: ***Legs***: No pain or injuries noted, ***Arms: left arm***: Swelling, tenderness, deformity, ***Extremities: Pulse, Motor*** and ***Sensory:*** No pulses

Posterior: No injury or pain noted.

History: Unable to obtain from patient

REASSESSMENT

Subjective Changes: None

LOC: Responsive to painful stimuli

Pupils: Right side and left side 4 mm, reactive

GCS: 2/3/4 = 9

Airway: Clear and open

Breathing: Continued assisting ventilations

Circulation: ***Blood pressure*****:** 88/58 mmHg, ***Pulses:*** 134, weak, and regular carotid (radial absent), ***Skin:*** Cyanotic, cool and clammy, ***Capillary Refill:*** 4 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Distended

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM

Head: Contusion left temporal area

Chest: ***Look:*** Open chest wound left anterior chest (should be sealed), ***Listen:*** Absent breath sounds on left side, ***Feel:*** No crepitus, ***Percussion:*** Hyperresonance on left side

Left Arm: Swelling, pain and deformity, ***Pulse, Motor*** and ***Sensory:*** Absent pulse

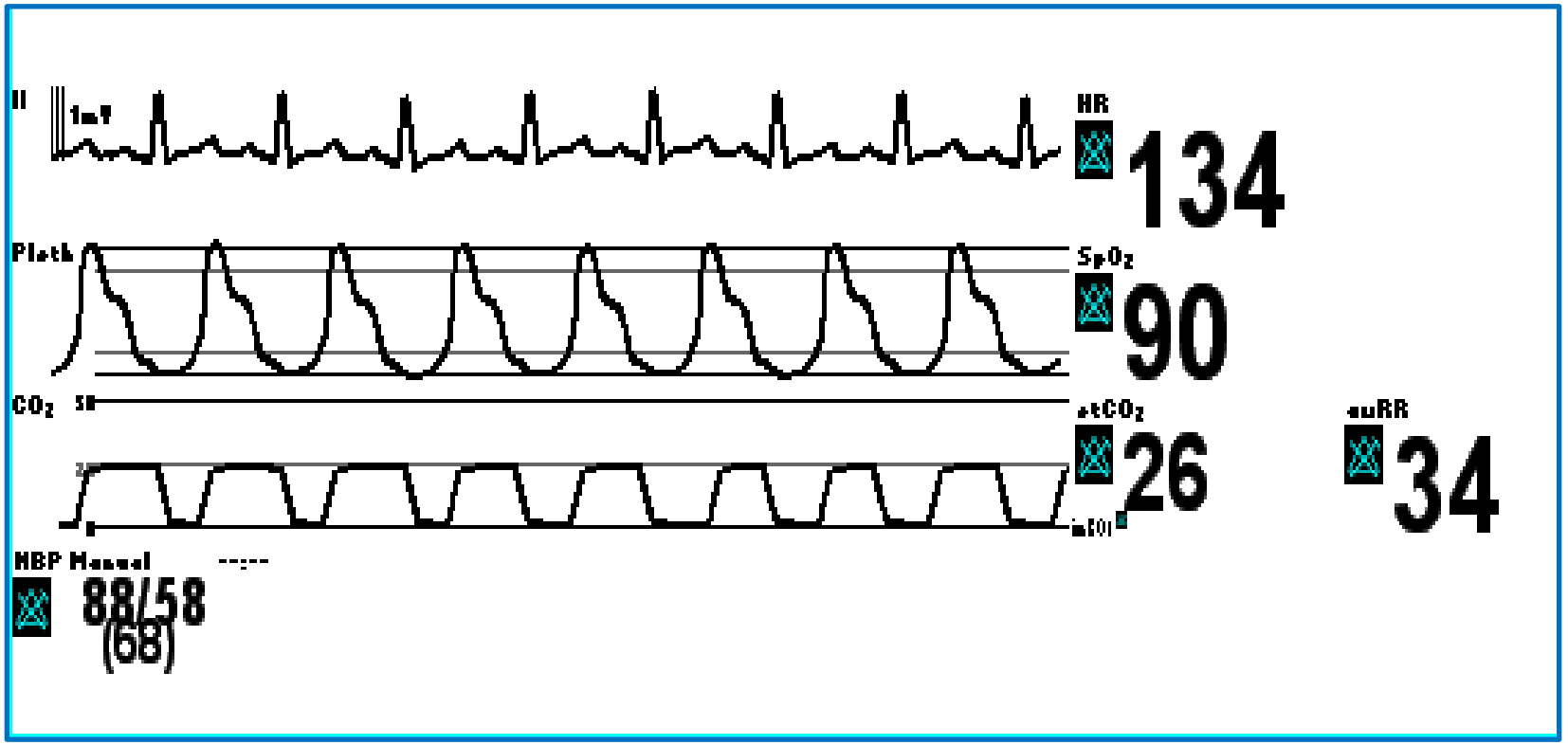
SECONDARY SURVEY

Deferred to during transport due to continuous Reassessments

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 34 without assistance, **HR:** 134, **B/P:** 88/58 mmHg **LOC:** Responds to painful stimuli, ***Pupils:*** 4 mm equal and reactive, ***Sensory*** *and* ***Motor****:* Intact **$ETCO_2$:** 26 mmHg **SPO_2:** 90% (if assisted) **GCS**: 2/3/4 = 14	**What priority is this patient?** Critical/ High Priority **Where should this patient be transported to?** Trauma Center **Should alternative transport be provided?** Consider aeromedical transport **What interventions should be done and when?** Airway maintenance and ventilation and potentially repeat needle decompression should be managed when identified (Obj. 2.3, Page 40)	**Airway/Breathing:** Airway adjunct and manual ventilation **Place occlusive dressing or flutter valve over wound** (Obj. 6.5, Page 132) **Oxygen therapy:** What liter flow should be used? 100% high flow O_2 at 12-15 liters/minute, try to maintain at least 92% O_2 saturation (Obj. 10.7, Page 205) **IV initiation:** Start IVs en route **When should the tension pneumothorax be decompressed?** As soon as it is identified as a tension (Obj. 6.8, Page 136)	**Blood pressure:** 88/58 mmHg **Pulses:** 134 carotid (absent radial) **RR:** 34, rapid, shallow and gasping (ineffective) **Skin:** Cyanotic, cold and clammy **Capillary Refill:** 4 seconds **LOC:** Responsive to painful stimuli, ***Pupils:*** Right side 4 mm, reactive, ***Pulse, Sensory*** and ***Motor:*** Absent distal pulses **$ETCO_2$:** 26 mmHg **SPO_2:** 90% **ECG:** Sinus tachycardia **GCS:** 3/3/3 = 9 **Blood Glucose:** 130 mg/dl (7.2 mmol/L)
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
Is it important to inspect the posterior aspect of the patient? Yes, to ensure no other life-threatening injuries exist (Obj. 10.5, Page 38) **What is the significance of the open wound to the left anterior chest and decreased chest motion?** The presence of an open tension pneumothorax. (Obj. 2.2, Page 135)	**What is the likely cause of hypotension in this patient?** Tension pneumothorax-mechanical or obstructive shock (Obj. 8.3, Page 159 & Obj. 6.7, Page 135) **Could a tension pneumothorax redevelop after decompression?** Yes (Obj. 2.6, Page 41)	**What rate should you ventilate the patient?** 8-10 breaths/minute **What level should the $ETCO_2$ be maintained?** 35-45 mmHg (Obj. 10.8, Page 205)	**Is it a high or low priority to perform a Second Survey on this patient?** This is a Load and Go patient and it is important to not have unnecessary delays of critical interventions or transport (Obj. 2.8, Page 43)

ADDITIONAL QUESTIONS

1. **What should decreased lung compliance in the intubated patient alert you to?** The possibility of a tension pneumothorax**.**
2. **What causes distended neck veins in a patient with a tension pneumothorax?** Collapsing of the inferior and superior vena cava occluding return blood flow to the heart.
3. **What is the major distinguishing sign difference between cardiac tamponade and a tension pneumothorax?** Clear breath sounds and muffled heart sounds with a cardiac tamponade.
4. **What are the indications for performing a chest decompression?** The presence of a tension pneumothorax with decompensation evidenced by respiratory distress and cyanosis, signs of shock, or a decreasing level of consciousness.



SETTING

EMS/Pre-hospital: ALS and BLS partners are dispatched to the scene of a pedestrian struck on a multi-lane highway (motorway). Police report he was hit by a large transfer truck (lorry) at 65 mph (100 kph). The fire department (fire brigade) is arriving at same time as EMS.

Occupational Health/Industrial: The Occupational Health & Safety Team has been called to the large trash compactor at the back an industrial plant. A worker has fallen in and been crushed. Workers have stopped the machine and are removing him from the hopper as the team arrives. EMS and Fire are arriving immediately after the team.

LEARNING OBJECTIVES

The learner will be able to:

- Describe hazards on the scene and how to mitigate them.
- State treatable causes of traumatic cardiopulmonary arrest.
- Demonstrate the evaluation and management of the patient in traumatic cardiopulmonary arrest.
- Describe patients in traumatic cardiopulmonary arrest for whom you should withhold resuscitation attempts.

KEY POINTS

1. Teamwork is important in the assessment and stabilization of the patient.
2. Assessing potential causes (the H's and T's) in a Traumatic Cardiac Arrest (TCA) help to direct management of treatable causes.
3. Tourniquets should be used, when applicable, for external hemorrhage control.
4. Extensive resuscitation efforts may be futile in the TCA patient and it may be appropriate to terminate resuscitation based on guidelines of National Association of EMS Physicians (NAEMSP) and American College of Surgeons (ACS). Consider any relevant local regulations/laws.

HISTORY

S	Patient unresponsive
A	Unknown
M	Unknown
P	Unknown
L	Unknown
E	As described in the setting

INJURIES

1. Near amputation above the right knee with major hemorrhage.
2. Unstable pelvis.
3. Agonal respirations.
4. Extensive facial injuries with blood from nose and mouth.
5. Cyanosis from shoulders up (Occupational/Industrial Health only).

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize significant mechanism of injury.
- Determine if resuscitation is appropriate and if so, load and go.
- Manual c-spine stabilization.
- Manage deadly bleed (tourniquet application).
- Manage airway patency, ventilation and oxygenation.
- Initiate CPR.
- Chest decompression.
- If Return of Spontaneous Circulation (ROSC), manage potential increased intracranial pressure.

PATIENT INSTRUCTIONS

A manikin can be used. If using a live patient, he/she is unresponsive.

MOULAGE

Manikin can have leg removed. Simulate bleeding with syringe pumping fake blood through piece of IV tube. Use manikin for needle decompression. Alternative is to use ribs from market covered with under pad or shirt and use a tire inner tube partially inflated behind it to simulate escape of air. Need needle long enough to reach through ribs.

TRAUMATIC CARDIOPULMONARY ARREST 1P-10

SCENE SIZE-UP: One patient and scene is secured from hazards.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is lying supine, blood bubbling in mouth, with agonal respirations and massive bleeding from right leg. (Delegate tourniquet application). **Life-Threatening Bleeding:** Yes

LOC: (with initial c-spine stabilization) Unresponsive

AIRWAY: Blood in airway

BREATHING: Agonal, ineffective, and shallow

Ventilation instructions: Direct team to assist ventilations

CIRCULATION:

Pulse: Very slow, weak carotid pulses, no radials, **Bleeding:** Massive bleeding from right leg; blood bubbling in mouth and in airway

Capillary Refill: Delayed

Skin: Cyanotic, cold and clammy

BASED ON THE MOI, WHAT POTENTIAL CAUSES OF POTENTIAL ARREST MAY BE SUSPECTED FROM THE INITIAL ASSESSMENT?

Hemorrhage in the airway, tension pneumothorax, diaphragmatic injury, hemorrhagic shock, flail chest (Obj. 21.1, Page 382)

RAPID TRAUMA SURVEY

Head: Mid-face unstable

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Contusion, marked ecchymosis, ***Listen***: No breath sounds on right side, present on the left; no heart sounds, ***Feel***: Crepitus on right side, ***Percussion:*** Decreased resonance on the right side, ***Heart Tones:*** Absent

Abdomen: No injuries noted, soft and non-tender

Pelvis: Unstable

Extremities: ***Legs***: Traumatic amputation above right knee (If tourniquet applied correctly, hemorrhage is controlled), ***Arms:*** Contusions and lacerations to both arms, ***Extremity Pulse, Motor*** and ***Sensory:*** Absent

Posterior: No injury noted

History: Unable to obtain from patient

REASSESSMENT

Subjective changes: None

LOC: Unresponsive

Pupils: Non-reactive

GCS: 1/1/1 = 3

Airway: Supraglottic airway inserted

Breathing: Assisted ventilations

Circulation: CPR initiated, ***Blood pressure***: n/a, ***Pulses:*** If Return of Spontaneous Circulation (ROSC) rapid, weak, and regular carotid, if no ROSC absent, ***Skin:*** Cyanotic, cool and clammy, ***Capillary Refill:*** Delayed

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified injuries: Tourniquet applied, bleeding controlled

FOCUSED EXAM

Head: Mid-facial fractures

Chest: Blunt chest trauma

Pelvis: Unstable

Left Leg: Amputated

SECONDARY SURVEY

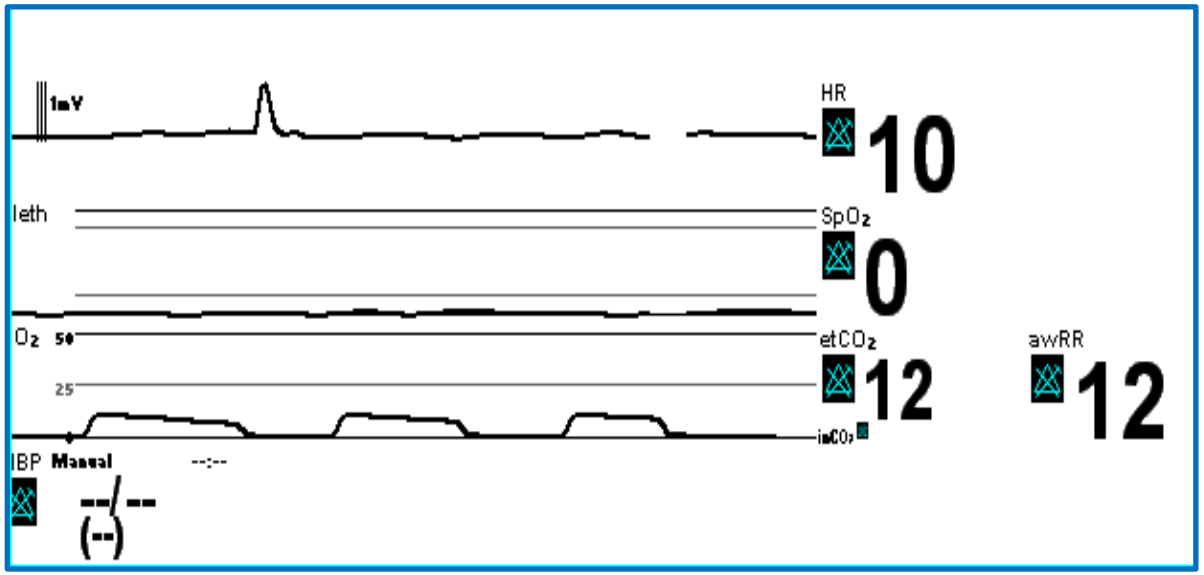
Not performed due to the critical nature of the patient

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: Absent, **HR:** 10, **B/P:** N/A **LOC:** Unresponsive ***Pupils:*** 8 mm, equal and unreactive, ***Sensory*** *and* ***Motor****:* Absent **$ETCO_2$:** 12 mmHg (with manual ventilations) **SPO_2:** N/A **GCS**: 1/1/1 = 3	**What interventions should be done on scene?** Spinal Motion Restriction, airway management, ventilation and CPR should be managed when identified as required (Obj. 21.2, Page 385) **What ratio of chest compressions to breathes is recommended for two-rescuer CPR?** 30:2 **What number of chest compressions is recommended per minute with two-rescuer CPR?** 100-110 (Obj. 21.2, Page 385)	**Airway/Breathing:** Supraglottic airway and BVM at RR of 8-10 **Chest Decompression and Tourniquet** **Oxygen therapy:** What liter flow should be used? 100% high flow O_2 at 12 - 15 liters/minute, maintain 95% O_2 saturation after ROSC (Obj. 10.7, Page 205) **IV initiation:** Start IVs en route **How much fluid should be administered?** Prior to ROSC, two liters of a resuscitation fluid or as directed by medical control. (Obj. 21.2, Page 387) Post-ROSC, the goal of fluid therapy should be to maintain systolic blood pressure at 110 to 120 mmHg in Traumatic Brain Injury (TBI). Avoid hypotension. (Obj. 10.6, Page 204)	**Blood pressure:** 60/P mmHg if ROSC **Pulses:** 120, weak carotid if ROSC **RR:** Assisted according to $ETCO_2$ if ROSC **Skin:** Cyanotic, cold and clammy **Capillary Refill:** Delayed **LOC:** Patient unresponsive, ***Pupils:*** 8 mm and unreactive, ***Pulse, Sensory*** and ***Motor:*** Absent **$ETCO_2$:** 48 mmHg (with ventilations) **SPO_2:** N/A **ECG:** Idioventricular **GCS:** 1/1/1 = 3 **Blood Glucose:** N/A
TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
What injuries are most concerning to patient survival? Cranial instability, **Chest:** Marked ecchymosis, right-sided crepitus and absent lung sounds **(**Obj. 21.2, Page 386) **If circulation can be restored, what potential secondary injury could evolve?** Increased cerebral pressure could lead to anoxic brain injury and herniation (Obj. 10.7, Page 194)	**What is the most likely reason ROSC will not be achieved following initial interventions?** There is inadequate circulating blood volume due to hemorrhagic blood loss (Obj. 21.2, Page 384)	**What rate should you ventilate the patient?** 8-10 breaths/minute **If the capnography reading is less than 10 mmHg during resuscitation, what correction should be considered?** Reducing the ventilatory rate and improving chest compression (Obj. 21.2, Page 389)	**Is it likely a Secondary Survey will be performed on this patient if ROSC is achieved?** Although it would be dependent on availability of caregivers, even if ROSC is achieved, the nature of continued patient management and number of critical injuries would make the opportunity to perform a Secondary Survey unlikely (Obj. 2.8, Page 43)

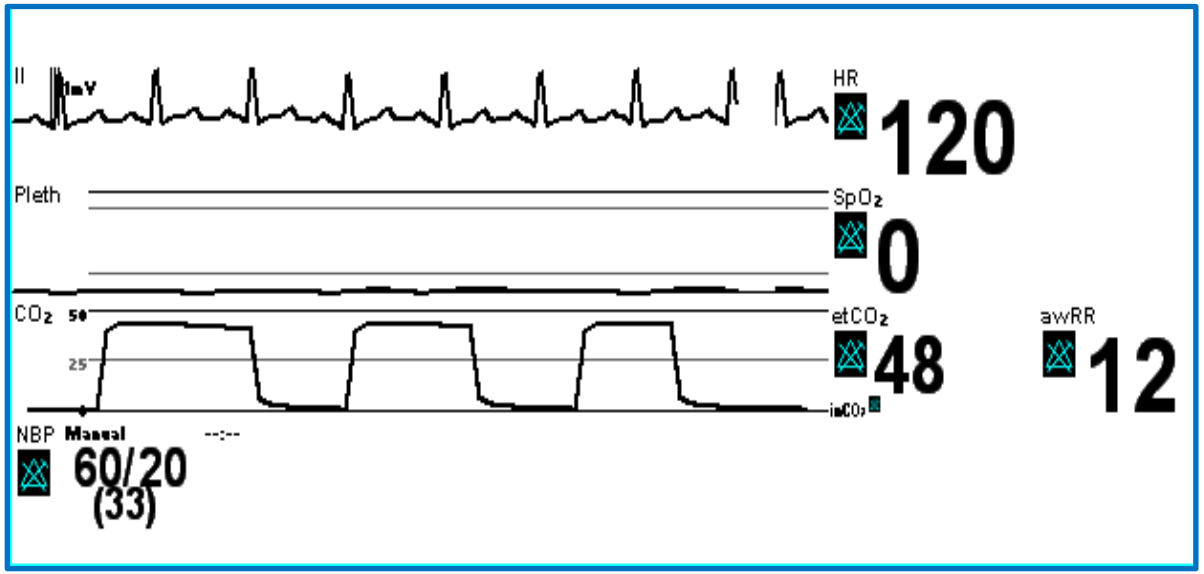
ADDITIONAL QUESTIONS

1. **What situations in this scenario would allow for interruption of the assessment sequence if they are unable to be delegated?** Exsanguinating hemorrhage, airway obstruction and cardiac arrest.
2. **What are some circumstances that require special consideration for traumatic cardiac arrest?** Drowning, lightning strike and hypothermia.
3. **What are some benefits of prehospital portable ultrasound?** Identification of cardiac tamponade, pneumothoraces and assessment of cardiac activity in suspected PEA.
4. **In what cases should resuscitation be withheld?** Blunt or penetrating trauma with no breathing, pulse, pupillary reflexes, spontaneous movement or organized ECG activity upon EMS arrival on scene; trauma with injures obviously incompatible with life; trauma with evidence of significant time lapse since pulselessness including dependent lividity, rigor mortis, etc.

Without Circulation



With Return of Spontaneous Circulation (ROSC)



Practice Scenarios Set 2

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ANKLE INJURY 2P-1

SETTING

EMS/Pre-hospital: A 25-year-old male stepped off a curb, causing his left foot to roll over. The man felt pain in his ankle and fell to the ground, stopping the fall with his hands. No loss of consciousness; pain and swelling are present in his left ankle.

Occupational Health/Industrial: A 25-year-old male was carrying boxes downstairs and misjudged a step. The man fell to ground, stopping the fall with his hands. No loss of consciousness; pain and swelling are present in his left ankle.

LEARNING OBJECTIVES

The learner will be able to:

- Perform a Focused Exam.
- Assess an ankle injury for fracture/sprains and strains.
- Splint and stabilize an ankle injury.

KEY POINTS

1. When to perform a Focused Exam versus a Rapid Trauma Survey.
2. Ensure there is no underlying injury masked by a distracting injury.
3. Splint injuries.

HISTORY

S Pain and swelling of the left ankle with decreased mobility
A Shellfish
M Coversyl and coated aspirin
P High blood pressure
L Lunch two hours ago
E As described in the setting

INJURIES

1. Left ankle closed injury with swelling, pain and decreased mobility.
2. Abrasions to the palms of both hands, no structural injuries and very minimal blood.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Perform a Focused Exam.
- Assess ankle injury.
- Stabilize and splint ankle injury.
- Transport in position of comfort and provide pain management (ice, elevation, splinting, analgesia).

PATIENT INSTRUCTIONS

The patient should demonstrate pain and decreased mobility in the left ankle, pain on touch/manipulation. The patient can feel sensation in their toes, but it is hard to move their ankle and toes.

MOULAGE

Swelling and some bruising on the left ankle. Abrasions to both palms with just a very little amount of blood.

ANKLE INJURY 2P-1

SCENE SIZE-UP: The patient is sitting upright on the ground. The patient and witness report no loss of consciousness. No overt trauma. The patient is complaining of pain in the left ankle. The patient stumbled and fell one step (less than 12 inches or 30 cm).

INITIAL ASSESSMENT

GENERAL IMPRESSION: Younger male sitting upright on ground. The patient appears to be in pain, but is able to speak in full sentences and is not short of breath.

Life-Threatening Bleeding: No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Regular, with adequate rate and tidal volume

Ventilation instructions: None

CIRCULATION:

Pulse: strong, regular, with an adequate rate (radial)

Bleeding: superficial abrasion/lacerations with very minimal bleeding on both palms

Capillary Refill: Fingers <2 seconds, left toes - 3 seconds

Skin: Pink, warm and dry

WHAT DOES THE INITIAL ASSESSMENT HELP THE PROVIDER DECIDE?

To prioritize the patient and to identify immediate life-threatening conditions and critical interventions. (Obj. 2.3, Page 34). To obtain a general impression of the patient and ABCs. (Obj. 2.3, Page 34).

RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED

Head: No injuries and stable structures

Neck: No injuries, appropriate movement, ***Trachea***: Midline, ***Neck veins***: 1 cm distension

Chest: ***Look:*** no bruising or signs of injury, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: stable and symmetrical movement, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs***: All structures are unremarkable except for the left ankle which is painful, swollen and has slight bruising starting, ***Pulse:*** Present, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** Minor abrasions of the palms and heels of the hands with droplets of blood, ***Pulse,*** Strong, ***Motor*** and ***Sensory:*** Intact

Posterior: Unremarkable

History: Obtain from patient

REASSESSMENT

Subjective Changes: None. If the ankle is splinted, the patient is calmer

LOC: Alert and oriented

Pupils: 4 mm equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Regular with adequate rate and tidal volume

Circulation: ***Blood pressure*****:** 130/84 mmHg, ***Pulses:*** 70 (radial), ***Skin:*** Pink, warm and dry, ***Capillary Refill:*** <2 seconds fingers), 3 seconds (left toes)

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: 1 cm distension

Chest: No changes

Abdomen: No changes

Identified Injuries: Left ankle painful, swollen and has bruising, ***Pulse:*** Present, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** no changes

FOCUSED EXAM – MAY MOVE DIRECTLY TO A FOCUSED EXAM

Left Ankle: Possible closed fracture or sprain of left ankle, which is painful, swollen and has a slight bruising starting, ***Pulse***: Present, ***Motor*** and ***Sensory***: Intact

SECONDARY SURVEY

History: See SAMPLE

Head: No injuries and stable structures

Neck: No injuries, appropriate movement, ***Trachea***: Midline, ***Neck veins***: 1 cm distension

Chest: ***Look:*** No bruising or signs of injury, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: stable and symmetrical movement, ***Heart Tones***: Normal S1, S2, ***Percussion:*** Resonant

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs***: All structures are unremarkable except for the left ankle which is painful, swollen and has slight bruising starting, ***Pulse:*** Present, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** Minor abrasions of the palms and heels of the hands with droplets of blood, ***Pulse,*** Strong, ***Motor*** and ***Sensory:*** Intact

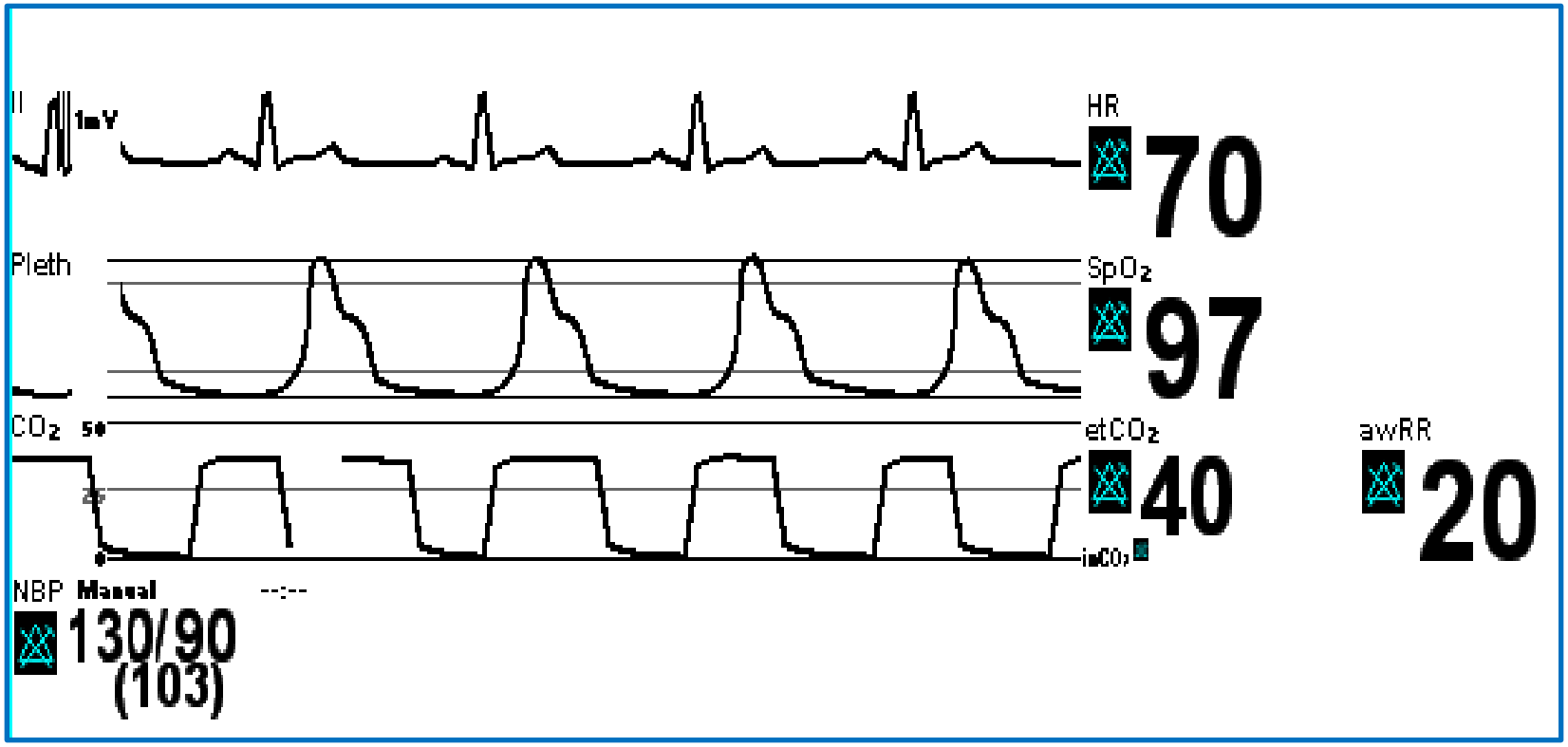
Posterior: Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 20, **HR:** 70, **B/P:** 136/90 mmHg **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Sensory****:* Intact, ***Motor****:* Intact, moves all extremities (except injured ankle, but does move toes). **$ETCO_2$:** Deferred **SPO_2:** 97% **GCS**: 4/5/6 = 15	The patient should be transported to the closest appropriate facility, preferably one that offers orthopedics.	**What are appropriate methods for splinting an ankle fracture or sprain?** Sam splint (Obj. 14.2, Page 277, Figure 14-8j.), blanket roll splint (Obj. 14.2, Page 277, Figure 14-8n.), pillow splint (Obj. 14.2, Page 286, Figure 14-20).	**Blood pressure:** 130/90 mmHg **HR:** 70 **RR:** 20, regular, and adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** 3 seconds (in toes) **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Pulse, Sensory*** and ***Motor:*** Intact **$ETCO_2$:** 40 mmHg **SPO_2:** 97% **ECG:** Normal sinus rhythm **GCS:** 4/5/6 = 15 **Blood Glucose:** 136 mg/dl (6.4 mmol/L)

TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
What is the goal of the Rapid Trauma Survey? To find all life threats (Obj. 2.3, Page 31 Figure 2-2, and Page 38).	**What is the goal of the Reassessment?** It is an abbreviated exam to assess for changes in the patient's condition, reassess treatments performed and evaluate patient condition (Obj. 2.7, Page 41).	**Why perform a Focused Exam on this patient?** The patient had no loss of consciousness, and there were no other critical factors for the scene and mechanism of injury that would indicate any other critical injuries other than an isolated ankle injury (Obj. 2.3, Page 37 and Page 30, Figure 2-1).	**How many times is a Secondary Survey performed?** Once (Obj. 2.8, Page 41). **What is the goal of the Secondary Survey?** To perform a comprehensive exam that can identify injuries missed in the Primary Survey. The Secondary Survey establishes a baseline to facilitate treatment decisions (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **How can you differentiate a closed fracture from an ankle sprain in the field?** They cannot be differentiated in the field. The injury should be treated as a fracture (Obj. 14.2, Page 271, PEARLS).
2. **What structures are involved in a sprain?** Ligaments (Obj 14.5 page 271).



SETTING

EMS/Pre-hospital: An ambulance has been dispatched to a backyard for a patient with their arm pinned under a vehicle.

Occupational Health/Industrial: An ambulance has been dispatched to the fabrication shop for a patient with their arm stuck in the industrial press.

Learning Objectives

The learner will be able to:

- State what types mechanisms of injury allows for a Focused Exam to be performed.
- Accurately assess and manage a crush injury.
- Describe possible associated trauma with the crush injury (e.g., fractures and crush syndrome).

Key Points

1. Poor perfusion and a lack of oxygen delivery causes the tissues to switch to anaerobic metabolism, which results in the buildup of toxic metabolites such as lactic acid.
2. Most extremities can tolerate up to four hours of ischemia before cell death occurs – though tissue hypoxia can happen in as little as one hour.
3. When circulation is restored, those toxic products are carried throughout the body and affect many organ systems.
4. Frequent Reassessments and close monitoring of vital signs is required.
5. Aggressive hydration with normal saline is required – it is believed that alkalizing the urine with intravenous sodium bicarb may reduce the risk of renal damage.
6. Consider application of a tourniquet when administering fluids or medications prior to releasing the entrapped body part is not possible.

HISTORY

S Pain to right arm
A None
M None
P Family history of diabetes and hypertension
L Toast and coffee
E As described in the setting

INJURIES

1. Crushed right lower arm.
2. Possible closed fractures associated.
3. Potential for crush syndrome to develop.

Assessment and Intervention Synopsis

- Recognize the mechanism of injury and stable vital signs and perform a Focused Exam and start treatment on scene.
- Recognize significance of crush injuries and the potential for rapid deterioration after releasing the entrapped body part (compartment syndrome).
- Initiate aggressive fluid therapy prior to releasing entrapped body part.
- Splint crushed extremity as there is potential for fractures to occur as well.
- Consider intravenous sodium bicarb – to reduce the risk of renal damage.
- Consider applying a tourniquet proximal to crushed area if fluids and medications cannot be provided.
- Consider pain management.

Patient Instructions

Patient should be alert, but anxious and complaining of right arm pain. Clearly explain mechanism of injury and that only the lower arm got trapped – no other associated trauma. Speak in full sentences and in mild respiratory distress due to pain. No head, neck or back pain and no loss of consciousness.

MOULAGE

Lower right arm swelling – reddening encircled around entire lower right arm.

ARM INJURY 2P-2

SCENE SIZE-UP: One patient and scene is safe, crush injury to lower right arm, extremity is still entrapped. Rescuers can easily release the entrapped limb without additional resources.

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Regular, slightly elevated due to pain, adequate tidal volume

Ventilation instructions: Consider providing supplemental oxygen

CIRCULATION:

Pulse: Rapid, strong and regular (radial) and carotid pulses present

Bleeding: None noted

Capillary Refill: <2 seconds in unaffected extremity

Skin: Pale, cool, moist

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is kneeling with their lower right arm pinned.
Life-Threatening Bleeding: No

WHAT SIGNS FROM THE INITIAL ASSESSMENT INDICATE THE PATIENT MAY BE IN SHOCK?

Anxiousness, tachycardia, tachypnea, pale, cool and moist skin (Obj. 8.2, Page 157).

RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED

Head: No injuries or pain noted

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No injuries present, ***Listen***: Clear and equal, no abnormal breath sounds ***Feel***: No injuries or pain noted, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries of pain noted.

Pelvis: Stable

Extremities: ***Legs***: No injuries or pain noted, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Arms: Left***: No injuries or pain noted (good distal pulses, movement sensation), ***Arms: Right***: Crushed right lower arm, extensive pain, and swelling, ***Pulse, Motor*** and ***Sensory:*** Intact

Posterior: No injuries or pain noted

History: Obtain from patient

REASSESSMENT

Subjective Changes: No changes

LOC: Alert and oriented

Pupils: 5 mm, equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Regular, slightly elevated due to pain, adequate tidal volume

Circulation*: Pulses:* 120 with no treatment; 112 with appropriate bolus, ***Skin:*** Pale, cool and moist, ***Capillary Refill:*** <2 seconds in unaffected extremity, >4 seconds in injured extremity

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified Injuries: *Right Arm*: Crushed right lower arm, extensive pain, and swelling, ***Pulse, Motor*** and ***Sensory:*** Intact before and after splinting

FOCUSED EXAM– MAY CHOOSE TO MOVE DIRECTLY TO FOCUSED EXAM

Right: Crushed right lower arm, extensive pain, and swelling,
Pulse, Motor and ***Sensory:*** Intact

SECONDARY SURVEY

Airway: No changes

Breathing: Regular, slightly elevated due to pain, adequate tidal volume

Head: No injuries or pain noted

Neck: No injuries or pain noted, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No injuries present, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel***: No injuries or pain noted, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: No injuries of pain noted

Pelvis: Stable

Extremities: ***Legs***: No injuries or pain noted, ***Pulse, Motor*** and ***Sensory:*** Intact, ***Arms: Left***: No injuries or pain noted (good distal pulses, movement sensation), ***Arms: Right***: Crushed right lower arm, extensive pain, and swelling, ***Pulse, Motor*** and ***Sensory:*** Intact

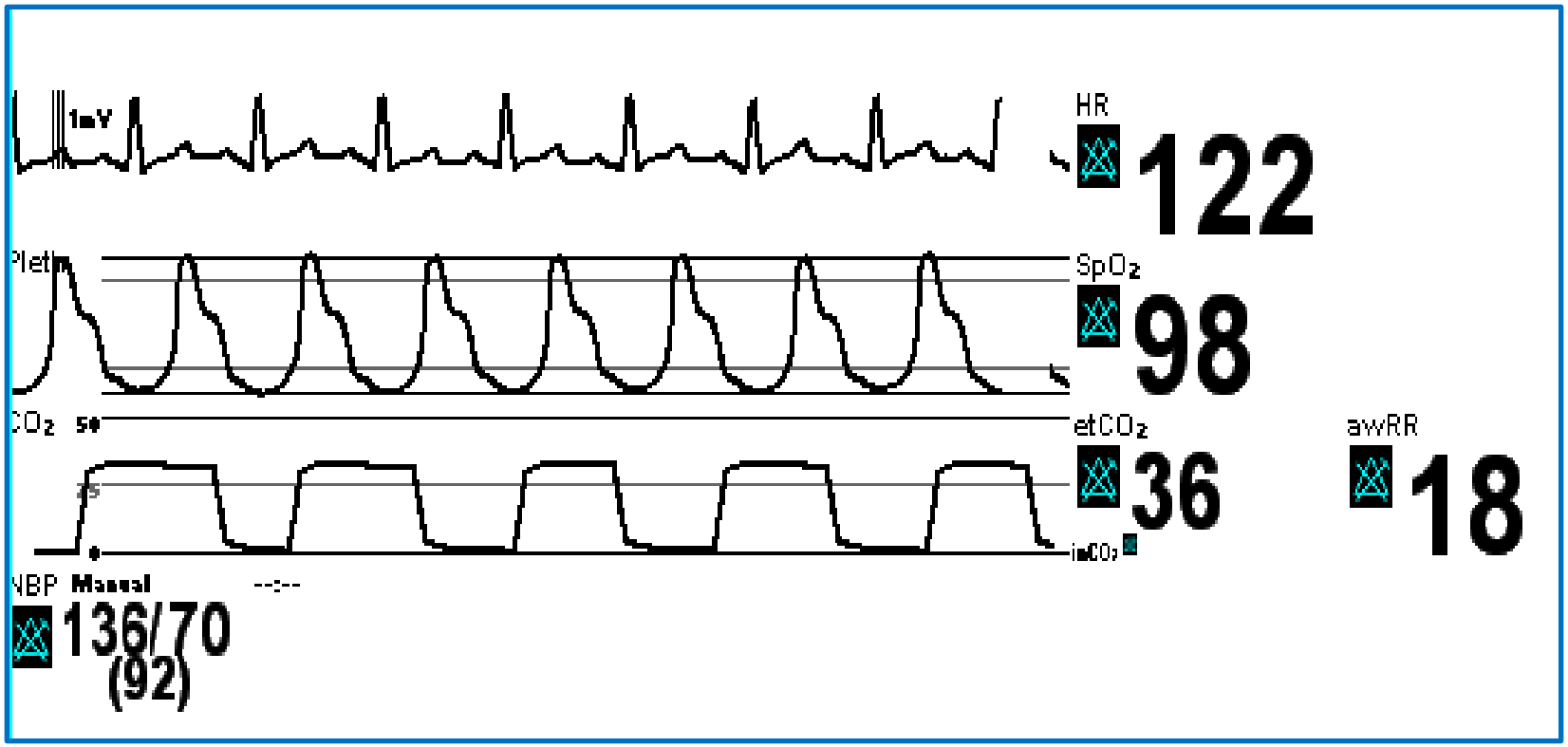
Posterior: No injuries or pain noted

History: Obtain from patient

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITAL SIGNS & NEUROLOGICAL
RR: 18, **HR:** 122, **B/P:** 136/70 mmHg **LOC:** Alert, but anxious, ***Pupils:*** 5 mm, equal and reactive, ***Sensory*** *and* ***Motor****:* Intact **$ETCO_2$:** 36 mmHg **SPO_2:** 98% **GCS**: 4/5/6 = 15	**What priority is this patient?** Medium priority with potential to deteriorate **Where should this patient be transported to?** Trauma Center **Should alternative transport be provided?** Consider resources that can provide intravenous sodium bicarb. **What interventions should be done?** Patient should have aggressive fluid therapy and consider applying a tourniquet before releasing the entrapped extremity to slow the release of toxins. The extremity should be splinted appropriately after it is released.	**Oxygen therapy:** **What liter flow should be used?** High-flow O_2 at 12-15 liters/minute. **IV initiation:** **How much fluid should be administered?** Large boluses should be initiated to assist in flushing out the toxins (Obj. 14.2, Page 272). Normal saline is preferred as lactated ringers contains potassium. The lower arm should be splinted after being released. **Consider pain management.**	**BP**: 136/70 mmHg (without pain control); 124/64 mmHg (with pain control) **HR**: 122, strong and regular (without pain control); 90, strong and regular (with pain control) **RR**: 18, Regular, slightly elevated due to pain, adequate tidal volume **LOC:** Alert, ***Pupils:*** 5 mm, equal and reactive, ***Sensory*** and ***Motor***: Intact **$ETCO_2$:** 36 mmHg **SPO_2:** 98% **ECG:** Sinus tachycardia or normal sinus rhythm (depending on pain) **GCS:** 4/5/6 = 15 **Blood Glucose:** 90 mg/dl (5.0 mmol/L)
RAPID TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
What injuries might you expect to find based on the mechanism of injury? Soft tissue injury, compartment syndrome	**Could the crush injury to the lower arm affect other body systems?** The heart may pump less effectively due to acidosis and hyperkalemia. The accumulation of myoglobin may affect the kidneys causing renal damage (Obj. 14.5, Page 272). **How can you minimize these risks?** Aggressive fluid therapy before releasing the entrapped extremity, alkalization of the urine with intravenous sodium bicarb, applying a tourniquet proximally before releasing the entrapped extremity if fluids or medication cannot be administered (Obj. 14.2, Page 272).	**Are any of these findings inconsistent with the working impression/diagnosis?**	**What are the indications or circumstances when a Secondary Survey should or should not be performed?** A Secondary Survey may be performed on scene if the Primary Survey does not reveal a critical condition. A Secondary Survey may not be performed if interventions during transport do not allow time for a Secondary Survey (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **What is the most serious complication with crush injuries?** The build-up of toxins that could affect other body systems.
2. **Could there be fractures associated with the crush injury?** Yes.
3. **What are some critical interventions for patients with crush injuries?** Recognizing the risk of releasing the entrapped extremity and providing appropriate treatments prior to release to decrease future complications.



CLAVICLE FRACTURE 2P-3

SETTING

EMS/Pre-hospital: A 22-year-old female gymnast slipped on the balance beam, striking her right anterior shoulder on the beam. She is complaining of right anterior shoulder/chest pain. No loss of consciousness. Her coach has applied ice to the injured area.

Occupational Health/Industrial: A 22-year-old female tripped on a pneumatic hose while walking through a machine shop. The patient tried to cushion her fall by extending her right arm before hitting the floor. She complains of right anterior shoulder pain/chest pain. No loss of consciousness. First aid staff have applied ice to the injured area.

LEARNING OBJECTIVES

The learner will be able to:

- Perform an Initial Assessment and Focused Exam.
- Splint the right arm and clavicle.
- Provide ice, compression/immobilization, elevation and analgesia for pain management as needed.

KEY POINTS

1. Recognize a focused mechanism of injury resulting in an isolated injury.
2. Identify the need to assess breath sounds due to possible lung involvement from the clavicle fracture.
3. Minimize secondary injury and discomfort by immobilization of injury.

HISTORY

S Deformity to right mid-shaft clavicle localized pain
A No known medical allergies
M None
P None, regularly participates in triathlons
L Lunch three hours ago
E As described in the setting

INJURIES

1. Right, mid-shaft, clavicle fracture.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Perform an Initial Assessment and Focused Exam.
- Splint right shoulder/arm ensuring adequate perfusion distal to injury site.
- Transport in position of comfort and provide pain management (ice, elevation, splinting, analgesia).

PATIENT INSTRUCTIONS

The patient should present as alert and oriented, complaining of 8/10 pain to right clavicle with the right shoulder sagging and rotated anteriorly.

MOULAGE

Mild diaphoresis, deformity right mid-shaft clavicle.

CLAVICLE FRACTURE 2P-3

SCENE SIZE-UP: The patient is sitting upright on the floor. Patient and witness report no loss of consciousness. Bystanders are providing aid.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient appears to be in excellent physical health. Her facial expression indicates discomfort. She is in a sitting position, with no apparent respiratory distress. **Life-Threatening Bleeding:** No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Regular, with adequate rate and tidal volume

Ventilation instructions: None

CIRCULATION:

Pulse: Strong, regular, with an adequate rate bilaterally (radial)

Bleeding: None

Capillary Refill: <2 seconds

Skin: Pink, warm and slight diaphoresis on forehead

WHAT MAY CAUSE THIS PATIENT'S DIAPHORESIS OTHER THAN SHOCK?

Environmental (exertion, ambient temperature) and pain (catecholamines on sweat glands) (Obj. 8.2, Page 156).

RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED

Head: No injuries and stable structures

Neck: No injuries, appropriate movement, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Deformity to the right clavicle, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: Deformity to the right clavicle, no subcutaneous emphysema, ***Percussion:*** Resonant***, Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs***: unremarkable ***Pulse:*** Present, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** Right arm restricted range of motion due to pain, ***Pulse,*** Strong, ***Motor*** and ***Sensory:*** Intact

Posterior: Unremarkable

History: Obtain from patient

REASSESSMENT

Subjective Changes: Appears to be in less pain

LOC: Alert and oriented

Pupils: 4 mm equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Regular with adequate rate and tidal volume

Circulation: ***Blood pressure*****:** 112/56 mmHg, ***Pulses:*** 60 (radial), ***Skin:*** Pink, warm and dry, ***Capillary Refill:*** <2 seconds

Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM – MAY CHOOSE TO MOVE DIRECTLY TO FOCUSED EXAM

Mid-shaft deformity to right clavicle, no edema or subcutaneous emphysema, ***Pulse***: Present, ***Motor*** and ***Sensory***: Intact

SECONDARY SURVEY

History: See SAMPLE

Head: No injuries and stable structures

Neck: No injuries, appropriate movement, ***Trachea:*** Midline, ***Neck veins:*** Flat

Chest: ***Look:*** Deformity to the right clavicle, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** Deformity to the right clavicle, no subcutaneous emphysema, ***Percussion:*** Resonant***, Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

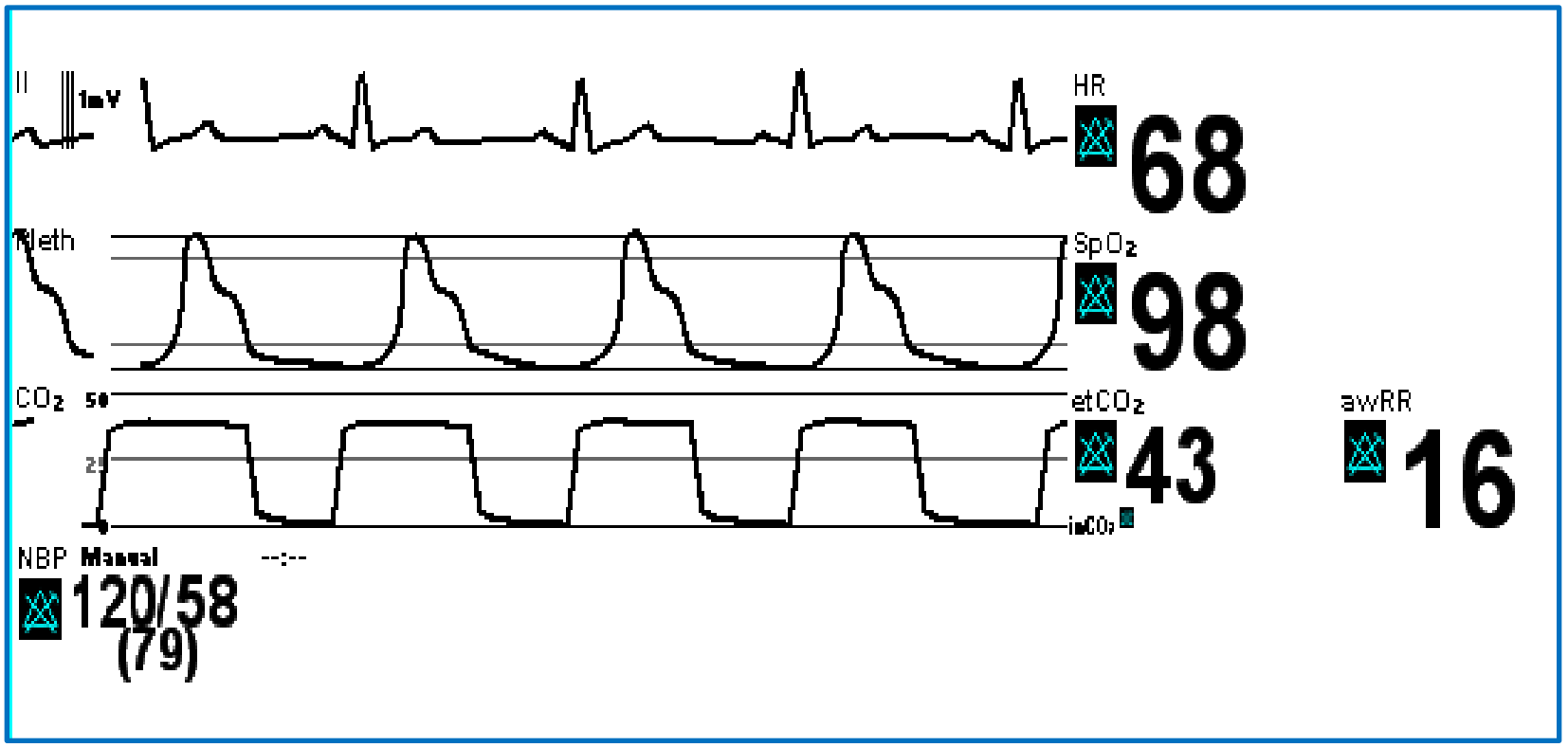
Extremities: Legs: unremarkable**,** ***Pulse:*** Present**,** ***Motor*** and Sensory**:** Intact, **Arms:** Right arm restricted range of motion due to pain, ***Pulse,*** Strong**,** ***Motor*** and ***Sensory:*** Intact

Posterior: Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 20, **HR:** 70, **B/P:** 120/58 mmHg **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Sensory****:* Intact, ***Motor****:* Intact, moves all extremities (except right arm guarded) **$ETCO_2$:** deferred **SPO_2:** 97% **GCS**: 4/5/6 = 15	The patient should be transported to the closest appropriate facility, preferably one that offers orthopedics.	**Splint right arm/shoulder:** Sling and swath, ice to injured area, analgesia as needed. **Even with proper, pre-hospital splinting of the clavicle, could movement cause additional injury?** Yes, complete stabilization of a fracture is difficult to obtain in the pre-hospital setting. Broken bone movement can damage muscles, nerves and blood vessels. (Obj. 14.5, Page 274).	**Blood pressure:** 120/58 mmHg **HR:** 68 **RR:** 16, regular, and adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Pulse, Sensory*** and ***Motor:*** Intact **$ETCO_2$:** 43 mmHg **SPO_2:** 98% **ECG:** Normal sinus rhythm **GCS***:* 4/5/6 = 15 **Blood Glucose:** Deferred
RAPID TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
Why, or why did you not perform a Rapid Trauma Survey instead of a Focused Exam? Why – A fall could be considered a dangerous generalized mechanism of injury, fall from a height (Obj. 2.3, Page 37). Why not – A focused mechanism of injury and isolated injury site (Obj. 2.3, Page 37).	**How frequently should the Reassessment be performed on this patient?** Every 15 minutes, or if the patient is moved, an intervention is performed, or the patient's condition worsens (Obj. 2.7, Page 41).	**Are the vital signs consistent with the injury and the general healthy fitness of the patient?** Yes, although normal response to pain is the release of catecholamines causing increased heart rate and blood pressure, the fitness level of the patient may minimize this response. (Obj. 8.2, Page 158).	**During the Secondary Survey and asking additional history questions, you are told the patient is in her first trimester of pregnancy. Does this change the priority of the patient?** No; however, normal physiological changes during pregnancy may mask hypovolemia. (Obj. 19.2, Pages 361-362).

ADDITIONAL QUESTIONS

1. **What general rules of splinting apply to this scenario and did you follow them?** Expose injured part; check pulses, movement and sensation distal to injury before and after splinting; splint one joint above and below injury site; pad the splint well. (Obj. 14.5, Page 274).
2. **What rules of splinting do not apply to this scenario?** Straightening severely angulated extremity if absent pulses; dress open wounds; do not push bone ends back under the skin; in life-threatening situations, splinting may occur during transport; if in doubt, splint.



SETTING

EMS/Pre-hospital: Dispatched to a ballpark for a patient reported to have been hit in the face with a baseball/cricket ball.

Occupational Health/Industrial: Dispatched to a machine shop where a large piece of metal broke off and struck the patient in the face.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat life-threatening injuries.
- List structures (anatomy) relevant to injury site.
- Explain management of facial injuries in relation to airway and c-spine.

KEY POINTS

1. Emphasize the need to ensure there is no airway compromise due to possible swelling and bleeding.
2. Reinforce that the impact of energy to the face could result in the need to maintain spinal motion restriction.
3. Fractures or an open globe need protection with an eye shield.

HISTORY

S Minimal bleeding, pain to right eye, nose and face

A No known medical allergies

M Albuterol

P Asthma

L One hour ago

E As described in the setting

INJURIES

1. Nasal fracture.
2. Fracture to the right zygomatic bone area of the orbit.
3. Hyphema to the right eye.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize significance of the mechanism of injury.
- Maintain airway.
- Control bleeding.
- Spinal Motion Restriction.
- Consider protecting the eye with an eye shield.
- Apply ice to injury without putting pressure on globe.

PATIENT INSTRUCTIONS

The patient should present as alert and complaining of pain to right eye, nose and face.

MOULAGE

Bruising to the right orbit and nose with minimal blood from the nostrils.

EYE INJURY 2P-4

SCENE SIZE-UP: The scene is safe with a coach/co-worker attending to the patient.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is sitting on the ground, conscious and in pain.
Life-Threatening Bleeding: No

LOC: Alert and oriented
AIRWAY: Patent
BREATHING: Regular, with adequate rate and tidal volume
Ventilation instructions: None

CIRCULATION:
Pulse: Strong, regular, with an adequate rate (radial)
Bleeding: Blood is oozing from the nose, some dried blood noted to face.
Capillary Refill: <2 seconds
Skin: Flushed, warm, with sweating noted.

IS THE PATIENT IN SHOCK?

No, the patient's perfusion is normal (Obj. 8.2, Page 156).

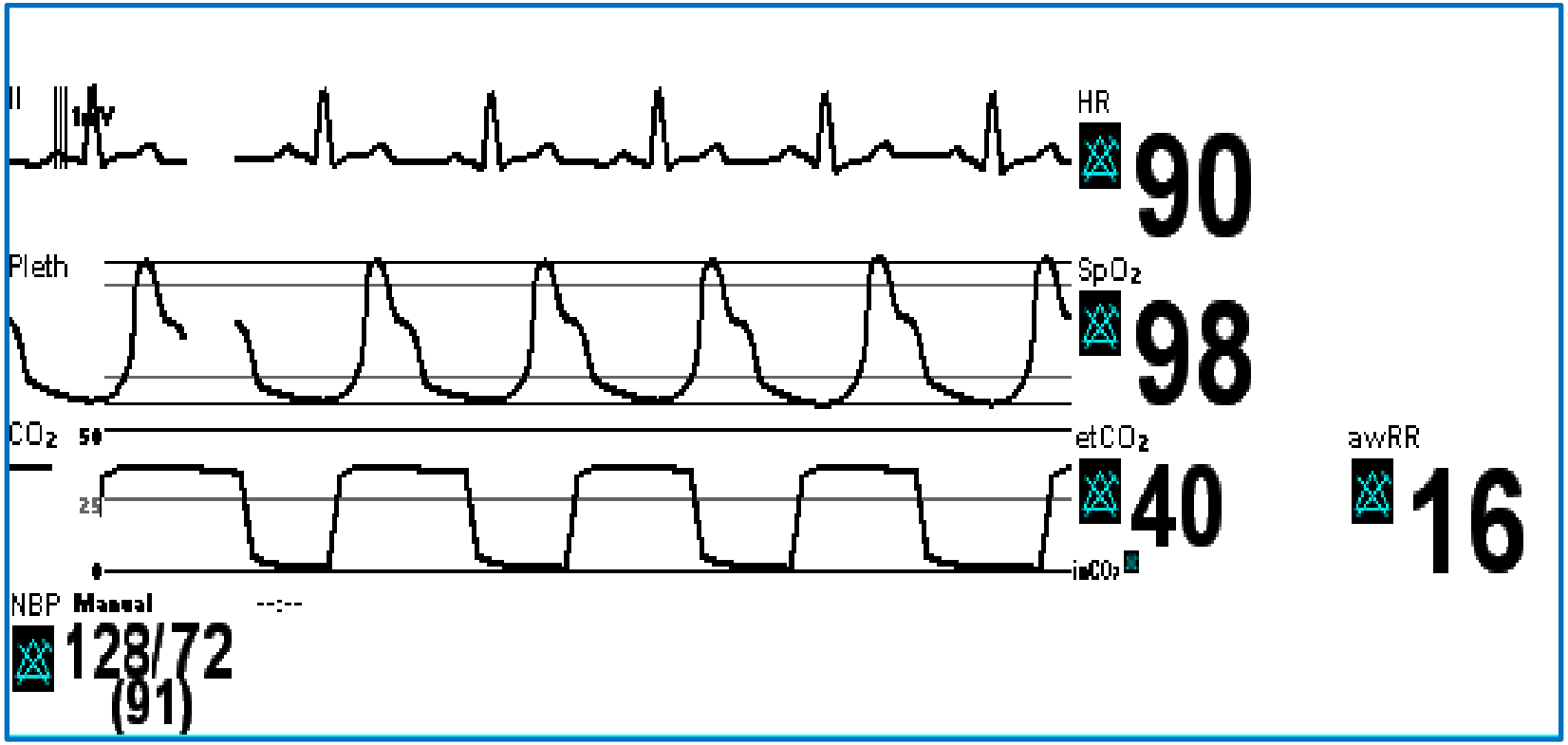
RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED	REASSESSMENT	FOCUSED EXAM – MAY CHOOSE TO MOVE DIRECTLY TO FOCUSED EXAM	SECONDARY SURVEY
Head: Ecchymosis to right orbit, globe intact, oozing of blood from nostrils **Neck:** No injuries, appropriate movement, ***Trachea***: Midline, ***Neck veins***: Flat **Chest:** ***Look:*** No trauma noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2 **Abdomen:** Soft and non-tender **Pelvis:** Stable **Extremities**: ***Legs***: Unremarkable, ***Pulse:*** Present, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** Unremarkable, ***Pulse,*** Present, ***Motor*** and ***Sensory:*** Intact **Posterior**: Unremarkable **History:** Obtain from patient	**Subjective Changes**: Patient calms slightly with reassurance **LOC:** Alert and oriented **Pupils**: 4 mm equal and reactive with hyphema to right eye **GCS**: 4/5/6 = 15 **Airway:** Patent **Breathing**: Slowed slightly with reassurance **Circulation:** ***Blood pressure*****:** 128/70 mmHg, ***Pulses:*** 100 (radial), ***Skin:*** Pink, warm, with sweating noted, ***Capillary Refill:*** <2 seconds **Neck**: No changes, ***Trachea***: Midline, ***Neck veins***: Flat **Chest**: No changes **Abdomen**: No changes **Identified Injuries**: No changes	**Exam of identified injury:** Ecchymosis to right orbit, globe intact, with hyphema to right eye, no deformity to the nose	**History:** See SAMPLE **Head:** No change in ecchymosis to the right orbit and nasal bleeding stopped **Neck:** No injuries, appropriate movement, ***Trachea:*** Midline, ***Neck veins:*** Flat **Chest:** ***Look:*** No trauma noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2 **Abdomen:** Soft and non-tender **Pelvis:** Stable **Extremities:** ***Legs:*** Unremarkable**,** ***Pulse:*** Present, ***Motor and Sensory:*** Intact, **Arms:** Unremarkable, ***Pulse,*** Present, ***Motor and Sensory:*** Intact **Posterior:** Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 22, **HR:** 112, **B/P:** 130/74 mmHg **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive with hyphema to right eye, ***Sensory*** *and* ***Motor****:* Intact **$ETCO_2$:** Deferred **SPO_2:** 97% **GCS**: 4/5/6 = 15	The patient should be transported to the closest appropriate facility.	**Should c-spine precautions be a concern, and how should the c-spine be managed?** With a blunt force injury to the face causing an orbit fracture and hyphema to the eye, c-spine precautions should be considered due to the blunt trauma. A cervical collar should be applied, and the patient allowed to sit upright to protect their airway from any nasal blood leakage. Allowing the patient to sit upright will also help reduce intraocular pressure (Obj. 11.3, Page 221).	**Blood pressure:** 128/72 mmHg **HR:** 90 **RR:** 16, regular, and adequate tidal volume **Skin:** Pink, warm, with sweating noted **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Pulse, Sensory*** and ***Motor:*** Intact **$ETCO_2$:** 40 mmHg **SPO_2:** 98% **ECG:** Normal sinus rhythm **GCS:** 4/5/6 = 15 **Blood Glucose:** 100 mg/dl (5.5 mmol/L)

TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
	What is a primary area of concern to be reassessed during the Reassessment? Continued airway patency (watching for swelling) (Obj 2.7, Page 41).	**If needed, what options for airway control may be used?** Clear the airway of secretions and assist ventilation if required. Position the patient to protect the airway if bleeding continues. Monitor the airway to ensure patency from swelling. Insert advanced airway if needed. (Obj. 4.3, Page 79).	**Were any further concerns identified during the Secondary Survey?** No additional injuries were noted. However, as part of the Reassessment, continue to monitor the swelling in the face to ensure a patent airway (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **What is your treatment for an open globe fracture?** Possible open globe, characterized by an irregularly shaped pupil, should not be irrigated but covered with an eye shield. Consider applying ice to face to decrease pain and swelling. Do not allow any pressure on the globe itself to prevent extrusion of the eye contents. (Obj. 10.5, Page 195).



SETTING

EMS/Pre-hospital: A 65-year-old female was wheeling garbage bins to the curb for collection when she stumbled, falling to the sidewalk on her right side. The patient is complaining of pain in her right hip and groin and felt immediate pain when she landed on the ground. The patient had no loss of consciousness. The patient was rolled onto her back by a neighbor. A small abrasion is visible on the patient's right cheek.

Occupational Health/Industrial: A 65-year-old female was working at a large retail store as the greeter and distributor of shopping carts. The patient was moving a row of carts that began to roll away from her, and she slid to ground, landing on her right side. The patient is complaining of pain in her right hip and groin. No loss of consciousness was reported by coworkers who witnessed the event. A coworker rolled the patient onto her back. The patient has a small abrasion visible on her right cheek.

LEARNING OBJECTIVES

The learner will be able to:

- Perform a Rapid Trauma Survey.
- Assess hip/pelvis for injuries.
- Splint and stabilize the hip/head of the femur.

KEY POINTS

1. When to perform a Focused Exam versus a Rapid Trauma Survey.
2. Obtain vital information for the decision-making process.
3. Splint injuries.

HISTORY

S Pain in right hip post-fall, unable to bear weight

A Blueberries

M Fosamax, Captopril, calcium and vitamin D supplements, enteric-coated aspirin

P Osteoporosis, hypertension

L Brunch two hours ago

E As described in the setting

INJURIES

1. Right femoral head/hip fracture with pain, external rotation, shortening and decreased mobility.
2. Abrasion to right cheek.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Perform a Rapid Trauma Survey.
- Assess hip injury.
- Stabilize hip/head of femur fracture.
- Consider pain management.

PATIENT INSTRUCTIONS

The patient should present with pain in the right hip and groin, shortening and external rotation of the right leg, unable to get up or weight bear. Pain on touch/manipulation. The patient can feel sensation in the right toes, but it is hard to move her foot and toes, good distal circulation. The patient is on her back.

MOULAGE

Shortening and external rotation of the right leg. Abrasion to right cheek.

HIP FRACTURE 2P-5

SCENE SIZE-UP: The patient is on the ground laying supine. Patient and witness report no loss of consciousness. The patient slid forward holding onto an object and hit the ground on her right side. The patient is complaining of pain in the right hip and groin and has a small skin tear-like abrasion on her right cheek. The witness rolled the patient supine before responders arrived.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient's eyes are open and she is laying supine on the ground. The patient appears to be in pain, but is able to speak in full sentences and is not short of breath. **Life-Threatening Bleeding:** No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Regular, with adequate rate and tidal volume

Ventilation instructions: None

CIRCULATION:

Pulse: Strong, regular, with an adequate rate (radial)

Bleeding: Superficial abrasion/skin tear on right cheek.

Capillary Refill: <2 seconds, right toes - 3 seconds

Skin: Pink, warm and dry

WHAT DOES THE INITIAL ASSESSMENT HELP THE PROVIDER DECIDE REGARDING ELDERLY PATIENTS?

If a Rapid Trauma Survey is required. Elderly patients are at an increased risk for serious injuries (Obj. 18.2, Page 349). As part of a high-risk group (Obj. 2.2, Page 38), the elderly patient will require a Rapid Trauma Survey.

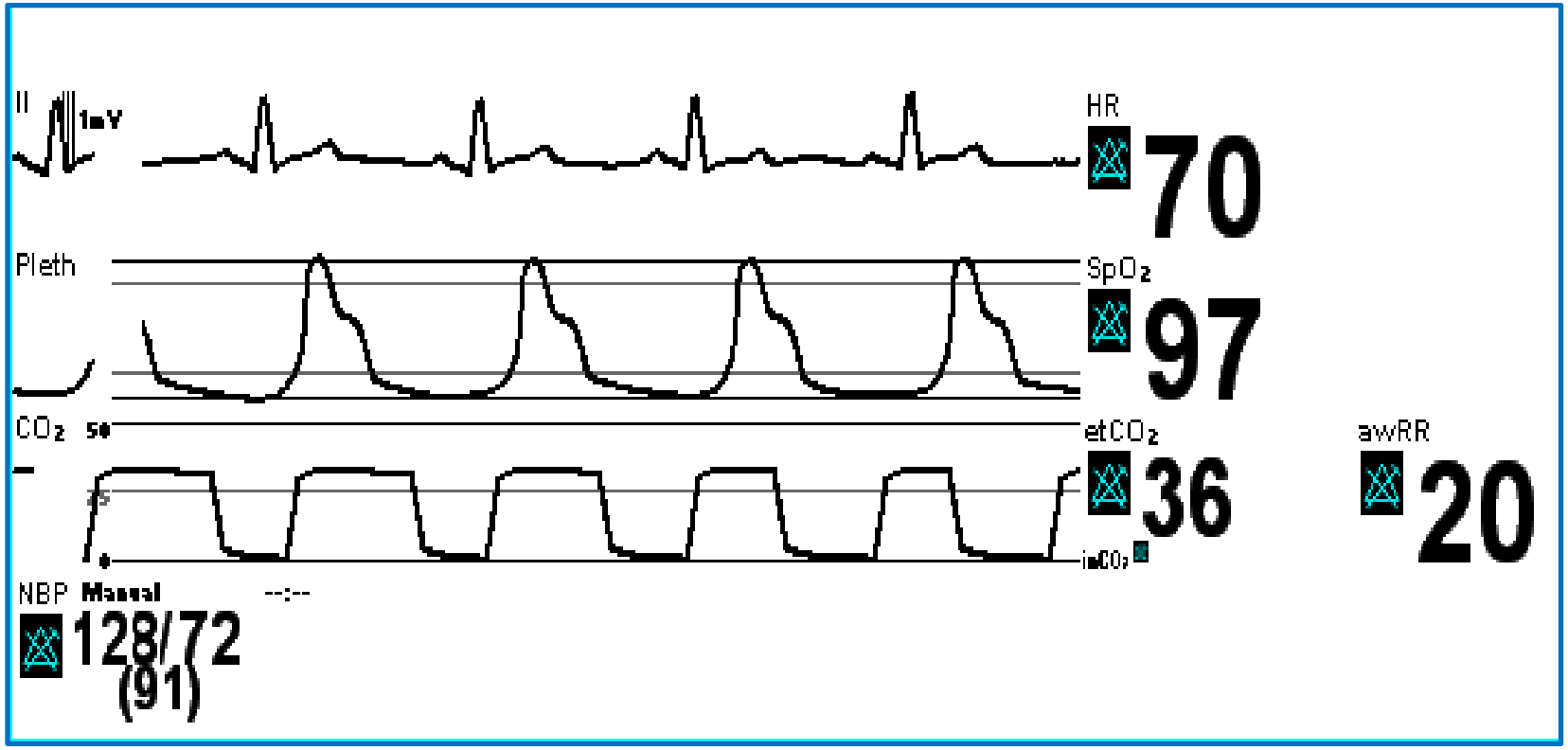
RAPID TRAUMA SURVEY – DUE TO PATIENT AGE AND POTENTIAL LIFE THREATS	REASSESSMENT	FOCUSED EXAM – FOLLOW UP RTS WITH A DETAILED FOCUSED EXAM	SECONDARY SURVEY
Head: No obvious injuries; a superficial abrasion and skin tear on the right cheek **Neck:** No injuries, appropriate movement, ***Trachea***: Midline, ***Neck veins***: Flat **Chest:** ***Look:*** No trauma noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2 **Abdomen:** Soft and non-tender **Pelvis:** Stable **Extremities**: ***Legs***: Pain and crepitus at right hip, shortening, external rotation and slightly delayed capillary refill, ***Pulse***, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** Unremarkable, ***Pulse, Motor*** and ***Sensory:*** Intact, **Posterior**: Unremarkable, **History:** Obtain from patient	**Subjective Changes**: None; if splinted, the patient is calmer but still has pain **LOC:** Alert and oriented **Pupils**: 4 mm equal and reactive with hyphema to right eye **GCS**: 4/5/6 = 15 **Airway:** Patent **Breathing**: Slowed slightly with reassurance **Circulation:** ***Blood pressure*****:** 128/78 mmHg, ***Pulses:*** 80 (radial), ***Skin:*** Pink, warm and dry, ***Capillary Refill:*** <2 seconds **Neck**: No changes, ***Trachea***: Midline, ***Neck veins***: Flat **Chest**: No changes **Abdomen**: No changes **Identified Injuries**: No changes	**Possible Fracture:** Right femoral head, no distal compromise **Check Interventions:** If the splint was applied and properly performed, then the patient appears more comfortable and calmer	**History:** See SAMPLE **Head:** No obvious injuries, a superficial abrasion and skin tear on the right cheek **Neck:** No injuries, appropriate movement, ***Trachea:*** Midline, ***Neck veins:*** Flat **Chest:** ***Look:*** No trauma noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2 **Abdomen:** Soft and non-tender **Pelvis:** Stable **Extremities:** ***Legs:*** Pain and crepitus at right hip, shortening, external rotation and slightly delayed capillary refill**, Pulse, Motor and Sensory:** Intact, ***Arms:*** Unremarkable, ***Pulse, Motor*** and ***Sensory***: Intact, **Posterior:** Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 24, **HR:** 100, **B/P:** 138/88 mmHg **LOC:** Alert and oriented and in pain, ***Pupils:*** 4 mm, equal and reactive, ***Sensory and Motor****:* Intact **$ETCO_2$:** Deferred **SPO_2:** 97% **GCS***:* 4/5/6 = 15	The patient should be transported to the closest appropriate facility, preferably one that offers orthopedics.	**What are some ways to splint a hip/femoral head fracture?** Use pillows and splint the injured leg to the uninjured leg (Obj. 14.5, Page 281). Use a rigid fixation splint (Obj. 14.5, Page 277, Figure 14-8l.). **What is the rule for splinting using a rigid splint?** Immobilize one joint above and one joint below the fracture (Obj. 14.5, Page 274 #5, Page 275).	**Blood pressure:** 128/72 mmHg **HR:** 70 **RR:** 20, regular, and adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Pulse, Sensory*** **and** ***Motor:*** Intact **$ETCO_2$:** 36 mmHg **SPO_2:** 97% **ECG:** Normal sinus rhythm **GCS:** 4/5/6 = 15 **Blood Glucose:** 86 mg/dl (4.8 mmol/L)

RAPID TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
What is the goal of the Rapid Trauma Survey? To find all life threats (Obj. 2.3, Page 31, Figure 2-2 and Page 38).	**What is the goal of the Reassessment?** To assess for changes in the patient's condition, reassess treatments performed and evaluate patient condition (Obj. 2.7, Page 41).	**Why perform a Focused Exam on this patient?** There was no loss of consciousness and no other critical scene factors. The mechanism of injury did not indicate any other critical injuries since the pelvis was stable, other than the isolated hip/femur head fracture that requires splinting (Obj. 2.3, Page 37 and Page 30, figure 2-1).	**How many times is a Secondary Survey performed?** Once (Obj. 2.8, Page 41). **What is the goal of the Secondary Survey?** It is a comprehensive exam that can identify injuries missed in the Primary Survey and establishes a baseline to guide treatment decisions (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **What should be done in the field when applying a rigid splint?** Apply padding to bony prominences (Obj. 14.5, Page 274 #6, Page 275).
2. **Should traction be applied using a traction splint on a hip fracture?** No. (Obj. 14.5, Page 278, 290).



KNEE DISLOCATION 2P-6

SETTING

EMS/Pre-hospital: The patient was playing soccer on a turf field when he planted his foot to pivot and felt immediate pain in his right knee. The patient then fell to the ground.

Occupational Health/Industrial: The patient is an employee at a commercial warehouse who was unloading a shelf. When he twisted, he felt immediate pain in his right knee and fell to the ground.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat non-life-threatening injuries.
- Identify the major signs and symptoms of knee dislocation.
- State what the treatment protocol is for knee dislocation.

KEY POINTS

1. Emphasize the Focused Exam.
2. Reinforce the number of potential complications of knee dislocation.
3. Stress the importance of ensuring peripheral circulation below the injury site.

HISTORY

S Pain in right knee after falling while twisting, no loss of consciousness
A None
M Ventolin inhaler
P Asthma
L Coffee and Danish two hours ago
E As described in the setting

INJURIES

1. Right facial abrasion from falling.
2. Right knee dislocation.
3. Right lower extremity, absent peripheral pulse in the foot and decreased sensation.
4. Pain in the right knee with a small amount of swelling.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Initial c-spine stabilization ruled out.
- Recognize the need to apply traction to right leg to straighten the knee and return peripheral circulation.
- Perform splinting of right knee.
- Initiate IV and consideration for pain management.

PATIENT INSTRUCTIONS

The patient responds and is alert and oriented. The patient is experiencing a great deal of pain from the right knee. The patent is having a difficult time moving toes on the right foot and can still feel decreased sensation in the foot.

MOULAGE

Pale, diaphoretic skin, facial abrasion, swelling, redness and warmth in right knee. Deformity to right knee.

KNEE DISLOCATION 2P-6

SCENE SIZE-UP: One patient and scene is safe. Twisting force caused the patient to fall to the ground; no loss of consciousness reported by witnesses.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is on the ground, in pain and groaning.
Life-Threatening Bleeding: No

LOC: Alert and oriented
AIRWAY: Patent
BREATHING: Regular, with a slightly elevated rate and adequate tidal volume
Ventilation instructions: None

CIRCULATION:
Pulse: Strong, regular, with an adequate rate (radial)
Bleeding: Small abrasion on right cheek
Capillary Refill: <2 seconds, right foot: absent
Skin: Pale, warm and diaphoretic

BASED ON THE INITIAL ASSESSMENT, WHY WOULD A FOCUSED EXAM BE INDICATED INSTEAD OF A RAPID TRAUMA SURVEY?

It is an isolated injury with no dangerous mechanism of injury (Obj. 2.3, Page 3).

RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED

Head: No deficits except for a small abrasion to the right cheek that is not bleeding, but does ooze a small amount of fluid
Neck: No injuries, appropriate movement, ***Trachea***: Midline, ***Neck veins***: Flat
Chest: ***Look:*** No trauma noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No crepitus or instability, ***Percussion:*** Resonant,
Heart Tones: Normal S1, S2
Abdomen: Soft and non-tender
Pelvis: Stable
Extremities: ***Legs***: Right knee obvious dislocation at the joint, ***Pulse***: Absent ***Motor*** and ***Sensory:*** Decreased, ***Arms:*** Unremarkable, ***Pulse, Motor and Sensory:*** Intact
Posterior: Unremarkable
History: Obtain from patient

REASSESSMENT

Subjective Changes: Once traction is applied, peripheral circulation is restored along with increased sensation
LOC: Alert and oriented
Pupils: 4 mm equal and reactive
GCS: 4/5/6 = 15
Airway: Patent
Breathing: Slowed slightly with reassurance
Circulation: ***Blood pressure*:** 126/82 mmHg, ***Pulses:*** 80 (radial), ***Skin:*** Pink, warm and moist,
Capillary Refill: <2 seconds
Neck: No changes, ***Trachea***: Midline, ***Neck veins***: Flat
Chest: No changes
Abdomen: No changes
Identified Injuries: Right knee has a pulse and sensation restored post-traction and splinting

FOCUSED EXAM – FOLLOW UP RTS WITH A DETAILED FOCUSED EXAM

Assess knee dislocation
Check Interventions: Return of peripheral pulse, sensation and mobility post-traction

SECONDARY SURVEY

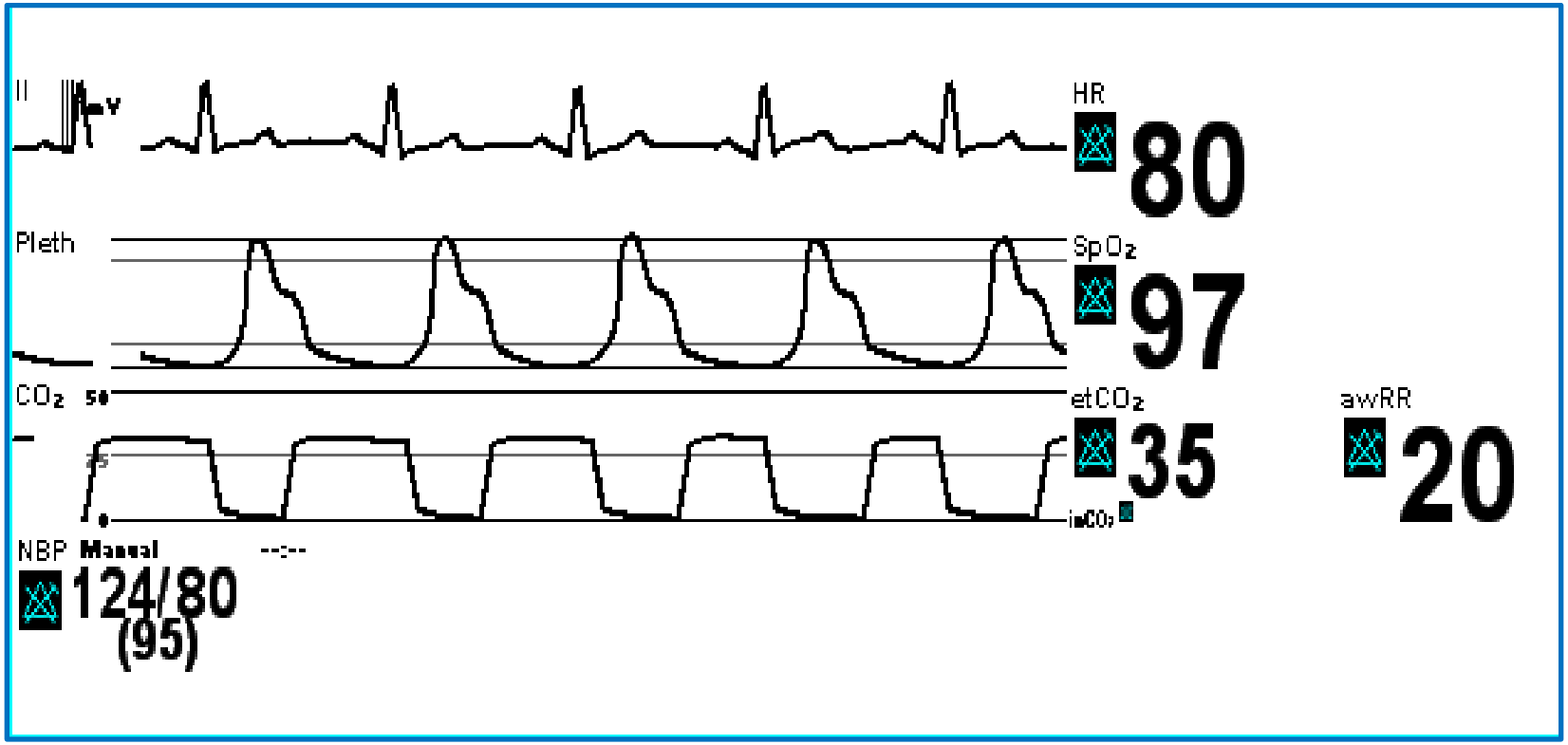
History: See SAMPLE
Head: No deficits except for a small abrasion to the right cheek that is not bleeding, but does ooze a small amount of fluid
Neck: No injuries, appropriate movement, ***Trachea:*** Midline, ***Neck veins:*** Flat
Chest: ***Look:*** No trauma noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No crepitus or instability, ***Percussion:*** Resonant,
Heart Tones: Normal S1, S2
Abdomen: Soft and non-tender
Pelvis: Stable
Extremities: Legs: Right knee has a pulse and sensation restored post-traction and splinting, **Arms:** Unremarkable, ***Pulse, Motor and Sensory:*** Intact
Posterior: Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 28, **HR:** 100, **B/P:** 130/84 mmHg **LOC:** Alert and oriented and in pain, ***Pupils:*** 4 mm, equal and reactive, ***Sensory*** *and* ***Motor****:* all other extremities are intact, right knee dislocation markedly decreased sensation below the site **$ETCO_2$:** Deferred **SPO_2:** 96% **GCS**: 4/5/6 = 15	**Load and go patient?** No, the patient requires traction to restore peripheral pulse. Transport to the closest appropriate facility offering orthopedics; if not available, closest emergency department.	**What is the most appropriate treatment for this patient?** Gentle traction to restore a peripheral pulse and once performed, splint in place. (Obj. 14.5, Pages 269, 271, 277, 282, Figure 14-8).	**Blood pressure:** 124/80 mmHg **HR:** 80 **RR:** 20, regular, and adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Pulse, Sensory and Motor:*** Intact **$ETCO_2$:** 35 mmHg **SPO_2:** 97% **ECG:** Normal sinus rhythm **GCS:** 4/5/6 = 15 **Blood Glucose:** 130 mg/dl (7.2 mmol/L)

RAPID TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
Why would a Rapid Trauma Survey be performed in this case? There may be only one isolated injury, but there may be others of which the patient is unaware. A provider may have a low threshold for doing a Rapid Trauma Survey (Obj. 2.3, Page 37-38).	**When should you perform a Reassessment for this patient?** Every 15 minutes for the stable patient, after an intervention is performed, if the patient is moved, or if the patient's condition worsens (Obj. 2.8, Page 41).	**What criteria would lead a provider to choose to perform a Focused Exam?** When there is a focused mechanism of injury with one isolated injury (Obj. 2.3, Page 37), and the Initial Assessment is normal (Obj. 2.3, Page 38) then move directly to the Focused Exam.	**Does the Secondary Survey need to be performed and why?** No, stable patients with no dangerous mechanism of injury do not require a Secondary Survey (Obj. 2.8, Page 43). **What components of a Secondary Survey would be performed on a stable patient?** Vital signs, detailed history of event/patient medical history, reexamine injury site (Obj. 2.8, Page 45).

ADDITIONAL QUESTIONS

1. **How is the treatment of this knee dislocation performed?** Use gentle traction to place the knee in a more anatomically correct position (Obj. 14.5, Page 269) and restore peripheral pulse by using hand traction along the long axis of the leg (Obj. 14.5, Page 282). If resistance is met, then splint the knee in place (Obj. 14.5, Page 277, Figure 14-8).
2. **What other treatment consideration is there for this patient?** Pain management for isolated injury (Obj. 14.2, Pages 268-269).



SETTING

EMS/Pre-hospital: Dispatched to a male assault victim. Reportedly the patient was beaten and stabbed. Police are on the scene.

Occupational Health/Industrial: Dispatched to a manufacturing site where a pneumatic staple gun accidentally discharged, and a projectile struck the worker in the neck.

LEARNING OBJECTIVES

The learner will be able to:

- Prioritize and treat presenting injuries.
- List anatomical structures relevant to the injury site.
- Explain the management of a potential impaled object about airway and c-spine.

KEY POINTS

1. Emphasize the need to complete thorough assessment and reassessment due to the potential for deterioration.
2. Reinforce impact of penetrating injuries especially to head, neck, and torso.
3. Bleeding control in a non-compressible site (e.g., QuikClot, HemCon, etc.) when tourniquet is not an option.

HISTORY

S Minimal bleeding, pain to the right side of neck and head

A Penicillin

M None

P Tonsillectomy and appendectomy

L One hour ago

E As described in the setting

INJURIES

1. Scattered abrasions to face.
2. The object was impaled right side of the neck, but pulled out by the patient, minimal bleeding.
3. Bruising to back.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Recognize the significance of the mechanism of injury. Patient stable, but there is potential for load and go due to the area of injury.
- Maintain c-spine and airway.
- Control bleeding.
- Demonstrate or state how to secure impaled object.
- Oxygen, hemorrhage control, IV access and medications during transport.

PATIENT INSTRUCTIONS

The patient is awake and alert, complaining of pain to face, head, back and right neck. Also acting mildly inebriated.

MOULAGE

Puncture wound right neck, minimal blood at the site. Abrasions to face and head. Bruising to back.

NECK INJURY 2P-7

SCENE SIZE-UP: The police have secured the scene. First Responders are on scene with one patient.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is sitting on the ground, conscious but very anxious and animated. **Life-Threatening Bleeding:** No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Rapid and shallow (patient anxious), with adequate tidal volume

Ventilation instructions: Apply oxygen

CIRCULATION:

Pulse: Strong, regular and rapid (radial)

Bleeding: Oozing from a neck wound and some dried blood noted to face and head.

Capillary Refill: <2 seconds, right foot: absent

Skin: Flushed, warm and diaphoretic

IS THE PATIENT IN SHOCK?

There is potential for shock. The patient is tachycardic, tachypneic, and diaphoretic. The patient appears to be compensating at this time based on normal mentation with adequate perfusion (Objective 8.2, Page 156).

RAPID TRAUMA SURVEY

Head: Abrasions noted with dried blood

Neck: Puncture wound to the right side of neck, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** No trauma noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs***: Unremarkable, ***Pulse***, ***Motor*** and ***Sensory:*** Intact, ***Arms:*** Unremarkable, ***Pulse, Motor and Sensory:*** Intact

Posterior: Bruises noted to back, no crepitus

History: Obtain from patient

REASSESSMENT

Subjective Changes: Patient calms slightly with reassurance

LOC: Alert and oriented

Pupils: 4 mm equal and reactive

GCS: 4/5/6 = 15

Airway: Patent, but patient complains of some swelling in the throat.

Breathing: Slowed slightly with reassurance

Circulation: ***Blood pressure***: 146/88mmHg, ***Pulses:*** 112 (radial), ***Skin:*** Pink, cool and dry, ***Capillary Refill:*** <2 seconds

Neck: Unchanged other than swelling noted, no additional bleeding, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM

Neck: The swelling has increased, and the patient is complaining of some throat tightness.

Check Interventions

SECONDARY SURVEY

Status post-injury: No complicated medical history. The patient admits to significant alcohol consumption. The patient also states there was "a lot of blood" at the initial scene.

Head: Abrasions, no gross bleeding

Neck: Swelling noted ***Trachea:*** Midline, ***Neck veins:*** Flat

Chest: ***Look:*** No trauma noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs:*** Unremarkable, ***Pulse, Motor*** and ***Sensory*****:** Intact, ***Arms:*** Intact, but some small lacerations now detected between the fingers-defensive knife wounds per the patient, ***Pulse, Motor*** and ***Sensory:*** Intact

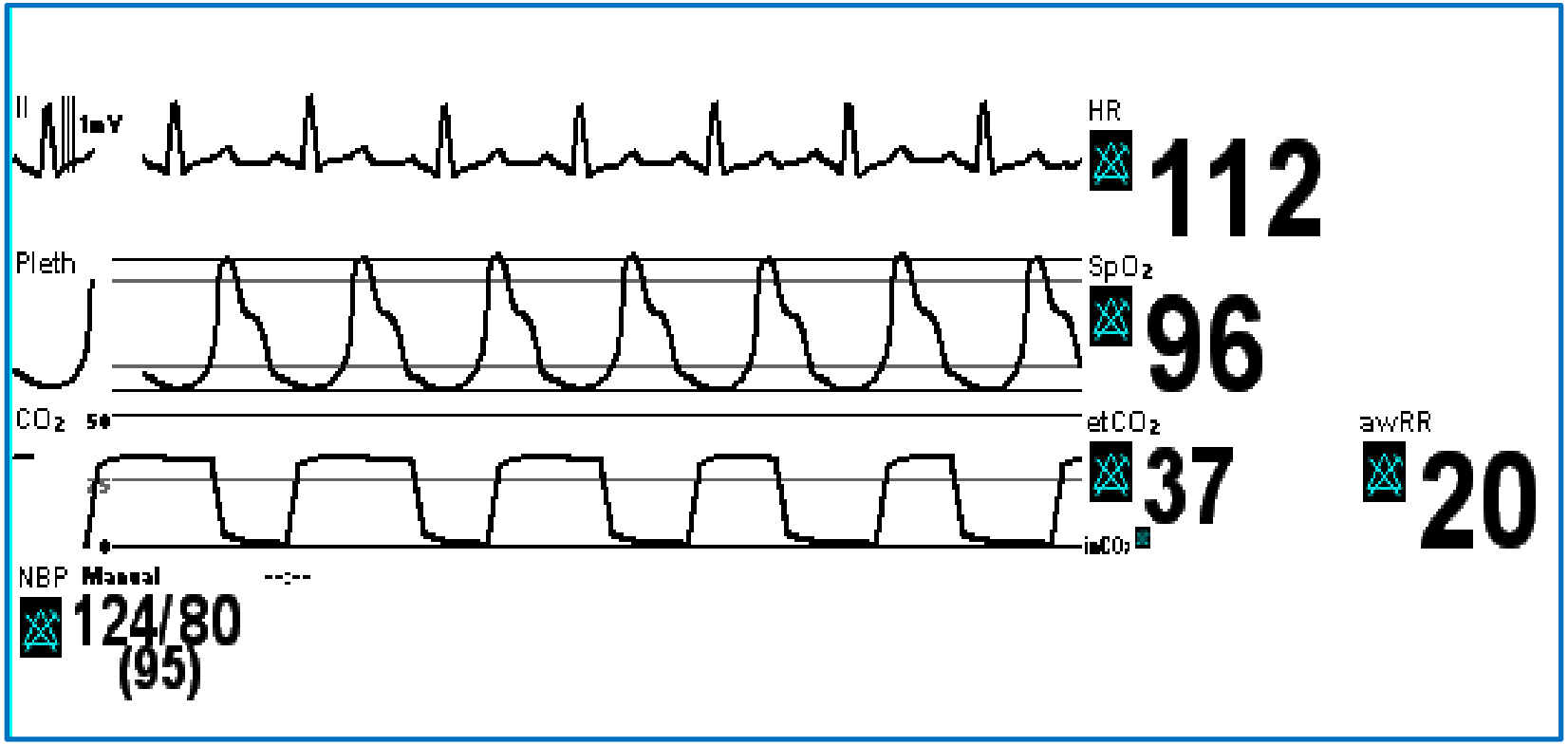
Posterior: Bruises noted to back, no crepitus

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 24, **HR:** 120, **B/P:** 160/96 mmHg **LOC:** Alert, oriented and in pain, ***Pupils:*** 4 mm, equal and reactive, ***Sensory*** *and* ***Motor****:* Intact, moves all extremities **$ETCO_2$:** Deferred **SPO_2:** 94% (room air); 98% (low flow oxygen) **GCS**: 4/5/6 = 15	Transport to the closest appropriate facility.	**Should c-spine precautions be a concern, and if so, how should they be managed?** If it is not possible to place a cervical collar on the patient, towel rolls may be used to stabilize the neck, or encourage the patient to maintain their neck in neutral alignment. Placing patient in an upright position may be necessary (Obj. 11.2 and 11.4, Page 231).	**Blood pressure:** 124/80 mmHg **HR:** 112 **RR:** 20, regular, and adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Pulse, Sensory*** and ***Motor:*** Intact **$ETCO_2$:** 37 mmHg **SPO_2:** 96% **ECG:** Sinus tachycardia **GCS:** 4/5/6 = 15 **Blood Glucose:** 130 mg/dl (7.2 mmol/L)

RAPID TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
Did this patient require a Rapid Trauma Survey versus a Focused Exam? A Rapid Trauma Survey is appropriate based on multiple injuries. (Obj. 2.3, Pages 37 and 38).	**What concerns do assessment changes raise?** The patient's vital signs are stable but need to be closely monitored for continued airway patency, swelling/edema and possibly secretions due to nausea. (Obj. 3.2a and 2c, Pages 58, 59 and 60).	**What options should be considered for airway control if needed?** Assist ventilation if required and clear airway of secretions. Position the patient to protect airway (Obj. 4.3 and 4.4, Page 72).	**Are there any concerns identified during the Secondary Survey?** While monitoring airway and bleeding control are imperative, it is also identified the patient's tachycardia continues; monitor for shock (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **Should an impaled knife blade be removed?** Only if the knife impairs the airway or if airway insertion is required (Obj.6.3, Page 142).
2. **What could cause the patient's anxiety other than the trauma?** Hypoxia or hypovolemia should be considered. Don't assume alcohol is contributing to altered mental status (Obj. 8.2, Page 159).



SETTING

EMS/Pre-hospital: Providers are on standby at a professional baseball game. A batter is hit in the chest by a fastball. The team trainer states that the patient was not involved in the ensuing melee.

Occupational Health/Industrial: A patient is working in a machine shop when a heavy press ejected a molded piece of hard plastic shaped like a baseball. The object struck the worker in the chest. No history of falling after incident.

LEARNING OBJECTIVES

The learner will be able to:

- Perform a Primary Survey, including a Focused Exam.
- State whether there appears to be any life-threatening conditions.
- Perform a Reassessment and a Secondary Survey.

KEY POINTS

1. When to perform a Focused Exam rather than a Rapid Trauma Survey.
2. What potential critical injuries to look for in the presence of a rib fracture.
3. To distinguish between a load-and-go situation and a routine, non-emergent transport.

HISTORY

S Rib pain that makes it hurt to breath

A None

M None

P None

L Lunch three hours ago

E As described in the setting

INJURIES

1. Simple rib fracture of the left, 5th rib at the anterior axillary line.
2. Minor abrasion to proximal condyle of the left ulna.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Perform a Primary Survey to include a Focused Exam.
- Identify possible rib fracture.
- Assess for possible pneumo/hemothorax or cardiac contusion.
- Discover and treat abrasion to left elbow.
- Obtain electrocardiogram.

PATIENT INSTRUCTIONS

Hold left arm against side with right hand on left wrist. Speak normally, but in 4-5-word phrases.

MOULAGE

Baseball size contusion left 5th rib, left anterior axillary line and abrasion medial left elbow.

RIB FRACTURE 2P-8

SCENE SIZE-UP: The scene is safe. The patient is standing with the trainer speaking to the patient.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is a male in his mid-20s who appears distressed, "splinting" his left chest with his arm. He is aware of his surroundings and tracks the providers' arrival. There is no obvious external bleeding.

Life-Threatening Bleeding: No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Mildly tachypneic and shallow with adequate tidal volume

Ventilation instructions: None

CIRCULATION:

Pulse: Strong, regular and rapid (radial)

Bleeding: None noted

Capillary Refill: <2 seconds

Skin: Pink, warm and moist

WHAT HAVE YOU LEARNED FROM YOUR INITIAL ASSESSMENT?

There is no indication of an immediately life-threatening condition (Obj. 2.6, Page 37).

RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED

Head: No obvious injuries/deformities

Neck: No obvious injuries and adequate movement, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Growing bruise at injury site, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: Tender with crepitus at injury site, ***Percussion:*** Deferred, ***Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs***: No obvious injuries, ***Pulse***, ***Motor, Sensory:*** Intact, ***Arms:*** *Minor abrasion to left proximal ulnar condyle*, ***Pulse:*** Present, ***Motor:*** Full range of motion, ***Sensory:*** Intact

Posterior: Unremarkable

History: Obtain from patient

REASSESSMENT

Subjective Changes: None

LOC: Alert and oriented

Pupils: 5 mm equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Shallow with adequate tidal volume

Circulation: ***Blood pressure*:** 120/74 mmHg, ***Pulse:*** 90 (radial), regular, ***Skin:*** Pink, warm and dry, ***Capillary Refill:*** <2 seconds

ECG: NSR without ectopy, without S-T/T-wave changes

Neck: No obvious injuries/deformities ***Trachea:*** Midline, ***Neck veins:*** Mildly distended (normal – supine)

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM – MAY CHOOSE TO MOVE DIRECTLY TO FOCUSED EXAM

Chest:

Look: Round contusion in area of left 5th rib, anterior axillary line. Moving symmetrically.

Listen: Clear all fields, equal bilaterally, ***Heart tones:*** Audible

Feel: Tender at site of contusion with crepitus 5th rib only

Percussion: Deferred

Left Wrist: Possible closed fracture or sprain of left elboq, no distal compromise

SECONDARY SURVEY

History: As above, no added details

Head: No obvious injuries/deformities

Neck: No obvious injuries and adequate movement, ***Trachea:*** Midline, ***Neck veins:*** Flat

Chest: ***Look:*** Growing bruise at injury site, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** Tender with crepitus at injury site, ***Percussion:*** Deferred, ***Heart Tones:*** Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable

Extremities: ***Legs:*** No obvious injuries, ***Pulse, Motor, Sensory:*** Intact, ***Arms:*** Minor abrasion to left proximal ulnar condyle, ***Pulse:*** Present, ***Motor:*** Full range of motion, ***Sensory:*** Intact

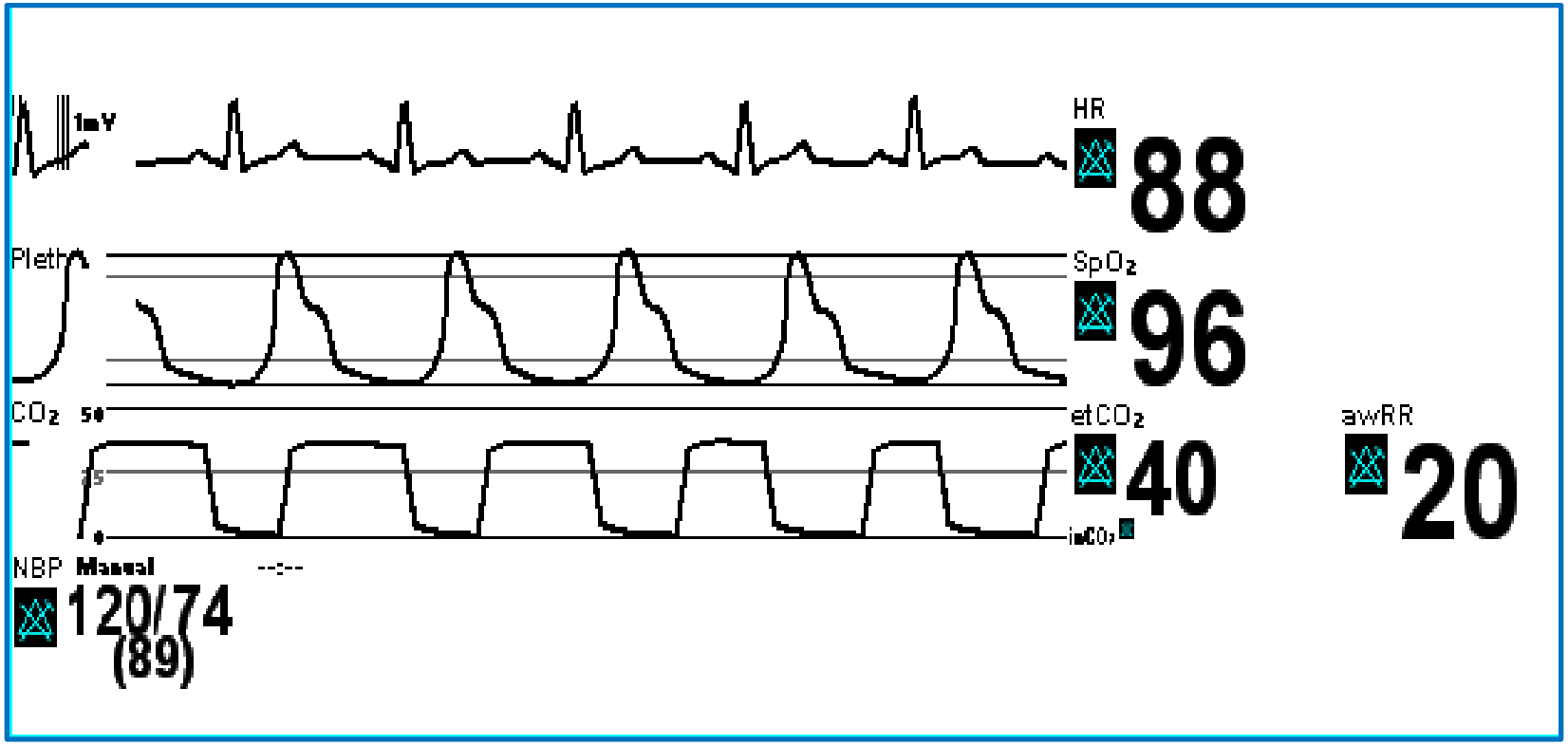
Posterior: Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 24, **HR:** 96, **B/P:** 134/78 mmHg **LOC:** Alert and oriented, ***Pupils:*** 4 mm, equal and reactive, ***Sensory****:* Intact, ***Motor****:* Intact **$ETCO_2$:** Deferred **SPO_2:** 95% **GCS**: 4/5/6 = 15	Transfer the patient to the ambulance for non-emergent transport to a designated team hospital (rather than trauma center). Reassess the patient once en route.	1. Spinal motion restriction 2. Splinting of left wrist 3. Vascular access if concern for shock **How will providers decide whether their patient should receive IV fluids?** This patient may exhibit signs of neurogenic shock and therefore may not show diaphoresis, pallor, or tachycardia. In fact, they may become bradycardic. The body's normal response to shock may be impaired. Providers must closely monitor blood pressure, mental status, and other signs of end-organ perfusion to assess perfusion status (Obj. 11.6, Page 216).	**Blood pressure:** 120/74 mmHg **HR:** 88 **RR:** 20, shallow with adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, ***Pupils:*** 4 mm, equal and reactive, ***Sensory*** and ***Motor:*** Intact **$ETCO_2$:** 40 mmHg **SPO_2:** 96% **ECG:** Normal sinus rhythm **GCS:** 4/5/6 = 15 **Blood Glucose:** Deferred

RAPID TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
	What is the reason for assessing the neck? To rule out a possible tension pneumothorax or cardiac tamponade (Obj. 6.2, Page 135-137). **Why should cardiac monitoring be performed?** To look for signs of cardiac contusion (Obj 6.10, Page 138-139)	**Does the Focused Exam identify any life threats?** No. **Does it suggest any potential life-threatening developments?** Yes. Providers should be aware of the possibility of a developing pneumo-/hemothorax or a cardiac contusion (Obj. 6.10, Page 145).	**Why should a Secondary Survey be performed?** To look for any additional injuries and form a baseline for further treatment (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **What signs and symptoms may indicate a cardiac contusion?** Chest pain, neck vein distension, irregular pulse, frequent PVCs, 12-lead ECG with S-T or T-wave changes, usually in leads II, III, aVF, V1, and V4R (Obj. 6.10, Page 138-139).
2. **How should a cardiac contusion be treated?** Treat according to ILCOR guidelines for dysrhythmias/chest pain (Obj. 6.10, Page 139).



SETTING

EMS/Pre-hospital: A 22-year-old male was attempting a new skateboarding trick when he fell approximately 12 feet (3 meters), striking his neck and upper back on a metal bench.

Occupational Health/Industrial: A 22-year-old male laborer was assembling a scaffold when he fell approximately 12 feet (3 meters), striking his neck and upper back on partially assembled scaffolding.

LEARNING OBJECTIVES

The learner will be able to:

- Assess for the presence of a spinal cord injury.
- Package the patient for transport.
- Discuss proper destination and mode of transport for a patient with a spinal injury.
- State assessment findings that would cause concern for neurogenic shock.

KEY POINTS

1. Spinal cord injuries can present with varying degrees of loss of function.
2. Spinal motion restriction would be appropriate and can be accomplished carefully and methodically due to the absence of immediate life threats. A discussion of the appropriateness of various spinal motion restriction devices/strategies should follow.
3. Although this patient's presentation is not immediately life-threatening, transport to a trauma center is still necessary and could impact long-term disability.

HISTORY

S Pain and tenderness to upper back, with weakness to extremities

A None

M Ibuprofen PRN

P None

L Breakfast three hours ago

E As described in the setting

INJURIES

1. Contusions to the posterior thoracic torso.
2. Weakness in all extremities, with arms weaker than legs. Sensation absent to shoulders and bilateral arms.
3. Closed fracture of the left distal forearm.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Initiate manual spinal motion restriction on approach, based on the mechanism of injury.
- Assess spinal injury, including distal motor and sensory function in all extremities.
- Apply spinal motion restriction and coordinate transport to appropriate trauma center.

PATIENT INSTRUCTIONS

The patient is anxious/fearful, with pain and tenderness to the upper back and can only weakly wiggle fingers bilaterally. The patient can weakly flex/extend hips, knees, and ankles. The sensation is absent in arms and shoulders.

MOULAGE

Contusions to upper back and contusions/closed deformity to left forearm.

SPINAL INJURY 2P-9

SCENE SIZE-UP: The patient is lying supine on ground with an object underneath him. He is alert, but anxious/distraught. (Occupational: Scaffolding has been secured.)

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is responding appropriately and lying in an awkward position. **Life-Threatening Bleeding:** No

LOC: Alert and oriented

AIRWAY: Patent

BREATHING: Rapid and mildly tachypneic, with adequate tidal volume

Ventilation instructions: None

CIRCULATION:

Pulse: Strong, regular and rapid (radial)

Bleeding: None noted

Capillary Refill: <2 seconds

Skin: Pink, warm and dry

WHAT DOES THE PATIENT'S PRESENTATION/POSITION INDICATE?

The patient is found in an awkward position and is restless. This indicates that they are either reluctant to move due to pain, fear of worsening an injury or are unable to move effectively (Obj. 2.3, Page 34).

RAPID TRAUMA SURVEY

Head: No obvious injuries/deformities

Neck: No obvious injuries/deformities
Trachea: Midline, ***Neck veins***: Mildly distended (normal – supine)

Chest: ***Look:*** No trauma noted, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No crepitus or instability, ***Percussion:*** Resonant,
Heart Tones: Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable, with no pain

Extremities: ***Legs***: No obvious injuries, ***Pulse***: Intact, ***Motor:*** Weak, ***Sensory:*** "Pins and needles", ***Arms:*** Closed fracture of the left forearm ***Pulse:*** Present, ***Motor:*** Decreased, ***Sensory:*** Absent

Posterior: Contusions and tenderness, especially over the cervical and upper thoracic spine

History: Obtain from patient

REASSESSMENT

Subjective Changes: None. The patient remains anxious/fearful and repeatedly asks if his hands/feet are moving.

LOC: Alert and oriented

Pupils: 4 mm equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Slowed slightly with reassurance

Circulation: ***Blood pressure***: 142/90mmHg, ***Pulse:*** 110 (radial), ***Skin:*** Pink, warm and dry, ***Capillary Refill:*** <2 seconds

Neck: No obvious injuries/deformities
Trachea: Midline, ***Neck veins:*** Mildly distended (normal – supine)

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM

1. Tenderness over C7/T1
2. Crepitus/deformity of left wrist
3. Neuro deficits as above

Check Interventions: If a long spine board is used as a lifting device and transport is prolonged, consider removing the spine board and secure the patient to the stretcher. Continue to monitor for shock.

SECONDARY SURVEY

History: As above, no added details

Head: No obvious injuries/deformities

Neck: No obvious injuries/deformities
Trachea: Midline, ***Neck veins:*** Mildly distended (normal – supine)

Chest: ***Look:*** No trauma noted, ***Listen:*** Clear and equal, no abnormal breath sounds, ***Feel:*** No crepitus or instability, ***Percussion:*** Resonant,
Heart Tones: Normal S1, S2

Abdomen: Soft and non-tender

Pelvis: Stable, with no pain

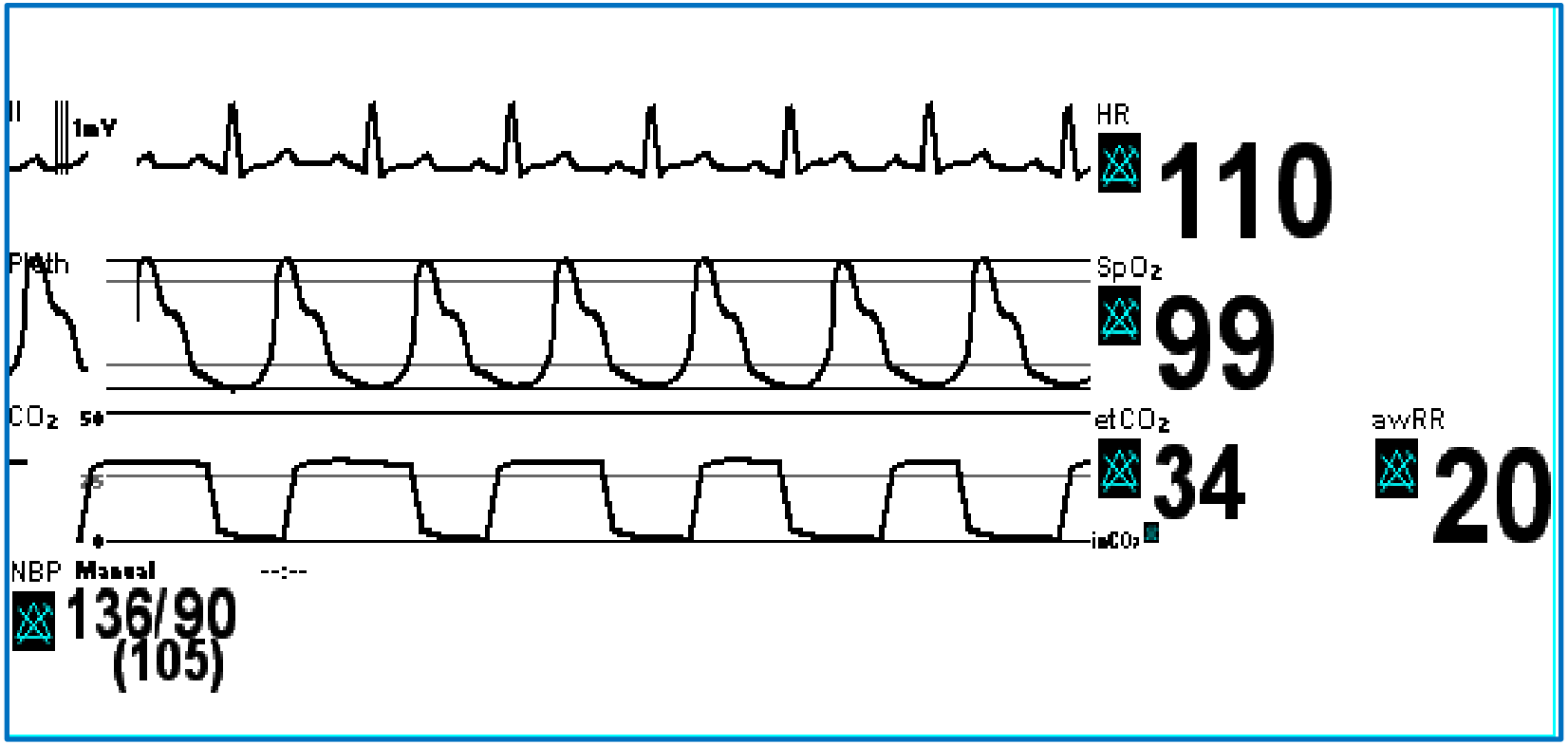
Extremities: ***Legs:*** No obvious injuries**,**
Pulse: Intact, ***Motor***: Weak, ***Sensory:*** **"**Pins and needles", ***Arms:*** Closed fracture of the left forearm ***Pulse:*** Present, ***Motor:*** Decreased, ***Sensory:*** Absent

Posterior: Contusions and tenderness, especially over the cervical and upper thoracic spine

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 24, **HR:** 116, **B/P:** 142/90 mmHg **LOC:** Alert and oriented, ***Pupils:*** 4 mm, equal and reactive, ***Sensory****:* "pins and needles"/numbness to legs, no sensation to arms, ***Motor****:* Weak, but present in legs, minimal in arms **$ETCO_2$:** Deferred **SPO_2:** 99% **GCS**: 4/5/6 = 15	Transport to the closest appropriate trauma facility.	1. Spinal motion restriction 2. Splinting of left wrist 3. Vascular access if concern for shock **How will providers decide whether their patient should receive IV fluids?** This patient may exhibit signs of neurogenic shock and therefore may not show diaphoresis, pallor, or tachycardia. In fact, they may become bradycardic. The body's normal response to shock may be impaired. Providers must closely monitor blood pressure, mental status, and other signs of end-organ perfusion to assess perfusion status. (Obj. 11.6, Page 216).	**Blood pressure:** 136/90 mmHg **HR:** 110 **RR:** 20, regular, and adequate tidal volume **Skin:** Pink, warm and dry **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, no loss of consciousness, ***Pupils:*** 4 mm, equal and reactive, ***Sensory:*** "Pins and needles"/numbness to legs, no sensation to arms, ***Motor:*** Weak but present in legs, minimal in arms **$ETCO_2$:** 34 mmHg **SPO_2:** 99% **ECG:** Sinus tachycardia **GCS*:*** 4/5/6 = 15 **Blood Glucose:** 92 mg/dl (5.1 mmol/L)
RAPID TRAUMA SURVEY QUESTION	**REASSESSMENT QUESTION**	**FOCUSED EXAM QUESTION**	**SECONDARY SURVEY QUESTION**
What potential life threats would be anticipated based on the Rapid Trauma Survey? The potential for occult hemorrhagic shock, developing neurogenic shock, or progression of loss of motor function (Obj. 3.2a, Page 58).	**Are there signs of progressing shock?** No. The patient's vital signs are not changing, and he appears to be mentating and perfusing well (Obj. 8.4, Page 171).	**Would it be appropriate to perform only a Focused Exam for this patient?** In this case, the mechanism suggests that injuries are likely in multiple areas, so a Rapid Trauma Survey is more appropriate. Providers may choose to perform a Focused Exam when they believe the mechanism of injury is likely to produce an isolated injury (Obj. 2.1, Page 37-38).	**When should the patient's wrist be splinted?** It is likely that many providers will choose to splint the wrist after moving the patient to the ambulance for transport. If there are enough providers on the scene to quickly splint the arm without delaying transport, this is acceptable, but transport should not be delayed (Obj. 14.1, Page 274).

ADDITIONAL QUESTIONS

1. **What is a secondary spinal cord injury?** Injury to the spinal cord caused by hypotension, generalized hypoxia, swelling or additional injury caused by movement (Obj. 11.4 Page 216).



SETTING

EMS/Pre-hospital: A 25-year-old female who is five months pregnant has fallen off a mini-trampoline at a low-impact fitness class. When the patient fell, she planted her right leg and felt immediate pain in her right shin. Bystanders confirm the patient had no loss of consciousness. The patient landed on the rubberized gym floor and broke her fall with her hand. There is a small abrasion on her right elbow/forearm.

Occupational Health/Industrial: A 25-year-old female who is five months pregnant was using a small 2-foot step stool and placing clothes on a high rack in a retail clothing store. The patient misjudged the step and fell off the stool. She landed on her right leg and felt immediate pain in her right shin. The patient struck her forearm on a shelf before landing on the floor. No loss of consciousness was reported by the patient or coworkers. The patient has a small abrasion to her right elbow/forearm.

LEARNING OBJECTIVES

The learner will be able to:

- Perform a Focused Exam.
- Assess the tibia/fibula for injuries.
- Splint and stabilize the lower leg.

KEY POINTS

1. When to perform a Focused Exam versus a Rapid Trauma Survey.
2. Obtain vital information for the decision-making process.
3. Splint injuries.

HISTORY

S Pain and swelling and instability in the middle of the right lower leg
A Peanuts
M Prenatal vitamins
P 5 months pregnant, prenatal examinations have been unremarkable
L Lunch two hours ago
E As described in the setting

INJURIES

1. Right tibia/fibula closed injury with swelling, pain and decreased mobility.
2. Abrasion to the right elbow/forearm, no structural injuries with very minimal blood.

ASSESSMENT AND INTERVENTION SYNOPSIS

- Perform a Focused Exam.
- Assess lower leg injury.
- Stabilize lower leg injury.
- Consider ice, elevation, and analgesia.

PATIENT INSTRUCTIONS

Pain, swelling and instability in the middle of the right lower leg. Pain on touch/manipulation. The patient can feel sensation in her toes, but it's hard to move ankle and toes, good distal circulation.

MOULAGE

Swelling and some discoloration to the middle of the right shin. Abrasion to the right forearm at the elbow, with a small amount of blood.

TIBIA/FIBULA FRACTURE 2P-10

SCENE SIZE-UP: The patient is sitting upright on the ground. The patient and witness report no loss of consciousness and no overt trauma. The patient is complaining of pain in the middle of right lower leg. Swelling is evident.

INITIAL ASSESSMENT

GENERAL IMPRESSION: The patient is sitting upright on the ground. She appears to be in pain, but can speak in full sentences and is not short of breath.
Life-Threatening Bleeding: No

LOC: Alert and oriented
AIRWAY: Patent
BREATHING: Mildly tachypneic and deep, with adequate tidal volume
Ventilation instructions: None

CIRCULATION:
Pulse: Strong, regular and rapid (radial)
Bleeding: Superficial abrasion/ lacerations with very minimal bleeding on right forearm at the elbow.
Capillary Refill: <2 seconds, right toes 3 seconds
Skin: Pink, warm and moist

WHAT DOES THE INITIAL ASSESSMENT HELP THE PROVIDER DECIDE?

To prioritize the patient, to identify immediate life-threatening conditions, critical interventions and obtain a general impression of the patient and ABCs (Obj. 2.3, Page 34).

RAPID TRAUMA SURVEY – MAY CHOOSE TO DO – NOT REQUIRED

Head: No obvious injuries/deformities

Neck: No obvious injuries and adequate movement, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Symmetrical, no obvious injuries, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No obvious injury, crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Pregnant, no obvious injuries and no pain/discomfort

Pelvis: Stable

Extremities: ***Legs***: Swelling, pain, instability, crepitus and some bruising to right mid-shaft tibia/fibula, ***Pulse***: Delayed capillary refill, ***Motor:*** Right foot/toes decreased movement due to pain and swelling above, ***Sensory:*** Intact, ***Arms:*** Small abrasion to right forearm, no crepitus, ***Pulse:*** Present, ***Motor:*** Full range of motion, ***Sensory:*** Intact

Posterior: Unremarkable

History: Obtain from patient

REASSESSMENT

Subjective Changes: None; the patient is calmer if their leg is splinted

LOC: Alert and oriented

Pupils: 5 mm equal and reactive

GCS: 4/5/6 = 15

Airway: Patent

Breathing: Appropriate rate and tidal volume

Circulation: ***Blood pressure*****:** 108/78 mmHg, ***Pulse:*** 100 (radial), ***Skin:*** Pink, warm and moist, ***Capillary Refill:*** <2 seconds, 3 seconds right toes

Neck: No obvious injuries/deformities ***Trachea:*** Midline, ***Neck veins:*** Flat

Chest: No changes

Abdomen: No changes

Identified Injuries: No changes

FOCUSED EXAM – MAY CHOOSE TO MOVE DIRECTLY TO A FOCUSED EXAM

Exam of Identified Injury: Right lower leg normal except for swelling, pain and some bruising forming to the right midshaft tibia/fibula, decreased mobility in right foot/toes due to pain and swelling above. Instability and crepitus in the right midshaft tibia/fibula and slight delayed capillary refill in right toes 3 seconds.

1. Possible closed fracture of right midshaft tibia/fibula, no distal compromise.

Check Interventions: If a splint was properly applied, the patient appears more comfortable and calmer

SECONDARY SURVEY

History: As above, no added details

Head: No obvious injuries/deformities

Neck: No obvious injuries and adequate movement, ***Trachea***: Midline, ***Neck veins***: Flat

Chest: ***Look:*** Symmetrical, no obvious injuries, ***Listen***: Clear and equal, no abnormal breath sounds, ***Feel***: No obvious injury, crepitus or instability, ***Percussion:*** Resonant, ***Heart Tones:*** Normal S1, S2

Abdomen: Pregnant, non-tender

Pelvis: Stable

Extremities: ***Legs***: Swelling, pain, crepitus and some bruising to right mid-shaft tibia/fibula, ***Pulse***: Intact, ***Motor:*** Right foot/toes decreased movement due to pain and swelling above, ***Sensory:*** Intact, ***Arms:*** Small abrasion to right forearm, no crepitus, ***Pulse:*** Present, ***Motor:*** Full range of motion, ***Sensory:*** Intact

Posterior: Unremarkable

VITAL SIGNS & NEUROLOGICAL	TRANSPORT	INTERVENTIONS	VITALS SIGNS & NEUROLOGICAL
RR: 20, **HR:** 100, **B/P:** 108/78 mmHg **LOC:** Alert and oriented, ***Pupils:*** 4 mm, equal and reactive, ***Sensory****:* Intact, ***Motor****:* Moving all limbs with a slight decrease in right foot/ toes due to injury **$ETCO_2$:** Deferred **SPO_2:** 97% **GCS**: 4/5/6 = 15	Transport the patient to a facility that has orthopedics and maternity, or to the closest appropriate facility	**What are appropriate methods for splinting a tibia/fibula fracture?** The technique (Obj. 14.5, Page 275, Figure 14-7); Sam Splint (Obj. 14.5, Page 277, Figure 14-8j); air splint (Obj. 14.5, Page 276, Figure 14-8e); rigid splint (Obj. 14.5, Page 275, including Figure 14-7). **What is the rule for splinting using a rigid splint?** Immobilize one joint above and one joint below the fracture (Obj. 14.5, Page 274 #5 and Page 275).	**Blood pressure:** 108/80 mmHg **HR:** 90 **RR:** 16, regular and adequate tidal volume **Skin:** Pink, warm and moist **Capillary Refill:** <2 seconds **LOC:** Alert and oriented, ***Pupils:*** 4 mm, equal and reactive, ***Sensory*** and ***Motor:*** Intact **$ETCO_2$:** 36 mmHg **SPO_2:** 96% **ECG:** Normal sinus rhythm **GCS:** 4/5/6 = 15 **Blood Glucose:** 97 mg/dL (5.4 mmol/L)

RAPID TRAUMA SURVEY QUESTION	REASSESSMENT QUESTION	FOCUSED EXAM QUESTION	SECONDARY SURVEY QUESTION
What conditions would need to be different to indicate the need for a Rapid Trauma Survey instead of a Focused Exam? A dangerous mechanism of injury, high-risk group, altered mental status, abnormal breathing or circulation, loss of consciousness, severe pain to the head, neck or torso. Find all life threats (Obj. 2.3, Page 38).	**How often should the Reassessment be repeated?** When the patient is moved, an intervention is performed, or the patient's condition worsens (Obj. 2.7 page 41).	**Why perform a Focused Exam on this patient?** No loss of consciousness, and no other critical scene factors or mechanism of injury that would indicate critical injuries other than a lower leg and elbow/forearm injury (Obj. 2.3, Page 37 and Page 30, Figure 2-1).	**How many times is a Secondary Survey performed?** Once (Obj. 2.8, Page 41). **What is the goal of the Secondary Survey?** To identify injuries missed in the Primary Survey. The Secondary Survey establishes a baseline to help treatment decisions (Obj. 2.8, Page 43).

ADDITIONAL QUESTIONS

1. **What must you remember to do in the field when applying a rigid splint?** To apply padding to bony prominences (Obj 14.5, Page 274 #6 and Page 275).
2. **May a traction splint be used on a tibia/fibula fracture?** No. (Obj, 14.5, Page 278, 290).