

## Emergency Primary Assessment – CE

### ALERT

**The presence of an environmental hazard (e.g., fire, noxious fumes, potential for explosion, active shooter) that mandates immediate evacuation of the area takes priority over the primary assessment.**

**Stabilize the cervical spine throughout the procedure if injury is suspected.**

**Do not proceed to the next assessment step until interventions for life-threatening conditions have been implemented.**

**Don appropriate personal protective equipment based on the patient's signs and symptoms and indications for isolation precautions.**

### OVERVIEW

The primary assessment is intended to assess and intervene rapidly for life-threatening conditions in critically ill or injured patients. The primary assessment is done at the initial point of patient contact and may be done again after the patient is transferred from the care of one team to another (e.g., when the emergency medical services team hands off the patient to the emergency department [ED] team members). To ensure that the primary assessment is thorough, a systematic approach should be taken, for example, following the widely used A-B-C-D-E mnemonic outlined in the procedure steps.

### PATIENT AND FAMILY EDUCATION

- If the patient has been injured, instruct him or her to avoid moving until a spinal cord injury has been ruled out.
- Explain the procedure to the patient and family, and why it is being performed, as time and the patient's condition allow.
- Encourage questions and answer them as they arise.

### PROCEDURE

1. If the primary assessment will take place at the scene of the incident, assess the scene for environmental hazards. If the scene is potentially unsafe, alert the proper authorities to secure the scene so the patient may be safely approached.
2. Perform hand hygiene and don gloves. As indicated by the situation, don mask, eye protection, and fluid-resistant gown.
3. Perform an across-the-room assessment upon the patient's arrival to quickly identify any life-threatening conditions such as uncontrolled hemorrhage. If a massive hemorrhage is present, apply direct pressure or a tourniquet as needed to control bleeding.
4. Perform the primary assessment using a systematic approach to ensure that no step is forgotten. The steps below follow the widely used mnemonic A-B-C-D-E:<sup>4</sup>

A = airway and alertness with simultaneous cervical spine (c-spine) protection

B = breathing and ventilation

C = circulation and control of hemorrhage

D = disability (neurologic status)

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E = exposure and environmental control

### **A = Airway and Alertness with Simultaneous C-spine Restriction**

1. Assess the patient's level of alertness using the AVPU scale to indicate whether the patient is *alert* (A), responds to *verbal* stimuli (V), responds to *painful* stimuli (P), or is *unresponsive* to all stimuli (U).
2. Maintain c-spine protection, if indicated, either manually or with an appropriate-size cervical collar.
3. If the patient is alert or responsive to verbal stimuli, have the patient open his or her mouth to assess the airway.
4. If the patient is not able to open his or her mouth and responds only to pain or is unresponsive, manually open the airway with either the jaw thrust (trauma) or the head tilt–chin lift (no trauma).
5. Inspect for potential airway obstructions (e.g., tongue, loose or missing teeth, blood, emesis, edema, foreign objects). If a definitive airway is in place, assess for proper placement of the airway.
6. If the airway is partially or completely obstructed, intervene as needed. Potential interventions include:
  - a. Airway positioning
  - b. Airway foreign object removal
  - c. Oropharyngeal suctioning
  - d. Oropharyngeal airway insertion
  - e. Nasopharyngeal airway insertion
  - f. Endotracheal intubation
  - g. Supraglottic airway insertion (laryngeal mask airway)
  - h. Retroglottic airway insertion (laryngeal tube airway)
  - i. Needle cricothyroidotomy
  - j. Surgical cricothyroidotomy
7. If the patient is at risk for a c-spine injury, have an assistant manually stabilize the patient's head until the primary and secondary assessments are complete and c-spine injury has been ruled out by radiograph or clinical examination, or until more definitive stabilization can be instituted. In the absence of an assistant, place towel rolls or foam blocks alongside the patient's head to help maintain alignment and remind a conscious patient to avoid moving.

### **B = Breathing and Ventilation**

1. Observe for spontaneous breathing, respiratory rate and depth, the rise and fall of the chest for symmetry, the use of accessory muscles, and any open chest wounds, such as an open pneumothorax. Note any signs of respiratory distress.
2. Briefly auscultate breath sounds bilaterally.
3. If spontaneous respirations are present, and the patient is alert, intervene as needed. Potential interventions include:
  - a. Patient positioning

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- b. Supplemental oxygen as indicated
  - c. Bilevel continuous positive airway pressure (BiPAP)
4. If respirations are absent or abnormal, intervene as needed. Potential interventions include:
- a. Bag-mask ventilation
  - b. Endotracheal intubation
  - c. Emergency needle thoracentesis
  - d. Chest tube insertion
  - e. Use of a flutter valve or occlusive dressing with one corner untaped for open pneumothorax (sucking chest wound)

### **C = Circulation and Control of Hemorrhage**

- 1. Evaluate a central pulse (carotid or femoral) for rate and strength.
- 2. Observe and palpate the skin for warmth, color, and moisture.
- 3. Check for exsanguinating external hemorrhage, and, if present, apply direct pressure to the site. If bleeding of the extremities is not controlled by direct pressure, consider applying a tourniquet.
- 4. If circulation is absent or altered, intervene as needed. Potential interventions include:
  - a. Chest compressions
  - b. Patient positioning
  - c. Vascular access and crystalloid fluid or blood administration
  - d. Defibrillation
  - e. Synchronized cardioversion
  - f. Transcutaneous cardiac pacing
  - g. Pericardiocentesis
  - h. Emergency thoracotomy and internal defibrillation

### **D = Disability (Neurologic Status)**

- 1. Evaluate neurologic status using the Glasgow Coma Scale (GCS), or, if the patient is intubated, the Full Outline of UnResponsiveness (FOUR) score.
  - a. The GCS is a universally accepted scoring system to obtain baseline measurements and to ensure that subsequent assessment changes will be apparent through the continuum of care. GCS scoring quantifies the level of impaired consciousness based on three components:

$$\text{best motor response} + \text{best verbal response} + \text{eye opening} = \text{GCS score}$$

The final score ranges from 3 to 15 points. A score of 3 means no response in any component. A score of 15 means the patient is awake, alert and oriented, verbal, moving all extremities, and following commands. A score of less than 8 indicates significant impairment in the level of consciousness. If one or more patient responses cannot be tested because an endotracheal tube has been placed or a paralytic medication has been administered, then those components are not

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scored and are indicated as not testable (NT); for example, an intubated patient who has decerebrate posturing (2) and opens eyes only to pain (2) receives a score of 4NT.<sup>1,3</sup>

**Intubate a patient with a GCS score of 8 or less to protect the airway.**

Determine GCS component scores by noting the patient's *best* response in each category:

### ***Best Motor Response***<sup>1,3</sup>

- 6 - Obeys commands
- 5 - Localizing
- 4 - Normal flexion
- 3 - Abnormal flexion
- 2 - Extension
- 1 - None
- NT

### ***Best Verbal Response***<sup>1,3</sup>

- 5 - Oriented
- 4 - Confused
- 3 - Words
- 2 - Sounds
- 1 - None
- NT

### ***Eye Opening***<sup>1,3</sup>

- 4 - Spontaneous
- 3 - To sound
- 2 - To pressure
- 1 - None
- NT

b. FOUR score<sup>5</sup>: This scale assesses four components: best eye response, best motor response, best brainstem reflexes, and respiratory pattern. Each component has a maximum value of 4, with a total score ranging from 0 to 16.<sup>5</sup> The FOUR score is a reliable scale that includes assessments not addressed by the GCS: brainstem reflexes, eye movements, and complex motor responses in patients with altered levels of consciousness. It also scores respiratory pattern instead of verbal response, which makes it especially helpful for patients who are intubated.

### ***Best Eye Response***

- E4 = eyelids open or opened, tracking, or blinking to command
- E3 = eyelids open but not tracking
- E2 = eyelids closed but open to loud voice
- E1 = eyelids closed but open to pain
- E0 = eyelids remain closed with pain

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### *Best Motor Response*

- M4 = thumbs-up, fist, or peace sign
- M3 = localizing to pain
- M2 = flexion response to pain
- M1 = extension response to pain
- M0 = no response to pain or generalized myoclonus status

### *Best Brainstem Reflexes*

- B4 = pupil and corneal reflexes present
- B3 = one pupil wide and fixed
- B2 = pupil or corneal reflexes absent
- B1 = pupil and corneal reflexes absent
- B0 = absent pupil, corneal, and cough reflex

### *Respiration*

- R4 = not intubated, regular breathing pattern
- R3 = not intubated, Cheyne-Stokes breathing pattern
- R2 = not intubated, irregular breathing
- R1 = breathes above ventilator rate
- R0 = breathes at ventilator rate or apnea

2. Assess pupil size, equality, and reaction to light.

### **E = Exposure and Environmental Control**

1. Remove the patient's clothing to allow for quick identification of all obvious injuries, other signs of illness, and any uncontrolled bleeding.
2. Keep the patient warm by covering with a warm blanket, using warming lights, keeping the room temperature warm, or using other commercial warming devices.

**When removing clothing, take care to avoid injury from unseen objects within the clothing, such as weapons, needles, or glass. For victims of crime, be sure not to cut through openings in clothing related to the violence (stabbing, gunshot wound) because doing so could destroy evidence; follow the organization's policy for evidence collection.**

### **Completing the Procedure**

1. After completing the primary assessment and addressing any life-threatening conditions as they are identified, evaluate whether the patient should be transferred elsewhere. Then proceed to the secondary assessment.

### **MONITORING AND CARE**

1. Monitor the patient for changes in:
  - a. Airway patency
  - b. Breathing effectiveness
  - c. Pulse, skin temperature, and color

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d. Neurologic status

### EXPECTED OUTCOMES

- Recognition of and appropriate intervention for life-threatening conditions

### UNEXPECTED OUTCOMES

- Failure to recognize and intervene appropriately for life-threatening conditions before progressing to the next assessment step, possibly resulting in deterioration of the patient
- Intervening for noncritical conditions, such as extremity fractures, before correcting life-threatening conditions, possibly resulting in deterioration of the patient

### DOCUMENTATION

- Conditions found in the primary assessment
- Vital signs and coma score
- Interventions performed (including name and dosage of medications administered) to address life-threatening conditions
- Unexpected outcomes and related nursing interventions
- Patient's response to interventions
- Patient and family education

### PEDIATRIC CONSIDERATIONS

- **A = Airway and alertness with simultaneous c-spine motion restriction**
  - Nasal suctioning is a high-priority intervention in an infant with nasal secretions.
  - Infants have a proportionately larger tongue, which may obstruct their airway.
  - Infants and young children have a prominent occiput. If they are laid on a firm, flat surface, the head may flex forward, occluding the airway or worsening a c-spine injury. Consider placing a towel roll under the shoulders so that the external auditory canal aligns with the shoulder.
- **B = Breathing and ventilation**
  - Young infants are preferential nose breathers. Nasal flaring is an indication of respiratory distress.
  - The ribs and sternum are more cartilaginous in children than in adults; therefore, retractions are common during respiratory distress.
  - Infants rely heavily on diaphragmatic breathing because of poorly developed intercostal muscles. For this reason, an upright posture is preferred for children in respiratory distress who do not require spinal motion restriction.
  - Because the chest wall of infants and small children is thin, auscultation of breath sounds may be misleading; that is, breath sounds may be transmitted from the opposite side, leading to “equal breath sounds,” even in the presence of right main stem intubation or pneumothorax. Breath sounds should be auscultated bilaterally at the axillae.
  - Avoid aggressively ventilating children; they are more susceptible to barotrauma.
  - Gastric distention may result from crying or excessive bag-mask ventilation, raising the diaphragm and restricting ventilation.
- **C = Circulation and control of hemorrhage**

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- Assess central and peripheral pulses in infants and young children. Capillary refill is an important circulatory assessment in infants and young children.
- Assess for capillary refill in a central area, such as the child's forehead, chest, or knee. Normal capillary refill is less than 2 seconds.
- Initiate chest compressions if the pulse rate is less than or equal to 60 bpm with evidence of poor perfusion or circulation.<sup>2</sup>
- **D = Disability (neurologic status)**
  - In infants and preverbal children, the level of consciousness is more difficult to assess than in adults. During the primary assessment, observe the child's response to handling or painful procedures and the presence of spontaneous movements. At the completion of the secondary assessment, assess neurologic status using an appropriate pediatric coma scale.
  - The anterior fontanel does not close until 12 to 18 months of age. A bulging anterior fontanel may indicate increased cranial pressure.
- **E = Exposure and environmental control:** Infants and young children have immature thermoregulatory capability and are susceptible to iatrogenic hypothermia. Keep children covered and provide warming as indicated.

### GERONTOLOGICAL CONSIDERATIONS

- **A = Airway and alertness with c-spine motion restriction:** Displaced dentures may cause airway obstruction.
- **B = Breathing and ventilation:** A supine position may be poorly tolerated and cause respiratory distress in older adults, especially those with significant preexisting pulmonary or cardiac disease.
- **C = Circulation and control of hemorrhage**
  - Capillary refill time increases as part of the aging process and is not a reliable indicator of systemic perfusion in adults.
  - In older adults, the decreased sensitivity of baroreceptors, decreased response to beta stimulation, and medications may prevent a compensatory tachycardia in response to decreased systemic perfusion.
- **D = Disability (neurologic status)**
  - Altered mental status in older adults should be assumed to be a new finding unless a history of dementia is known.
  - Older adults who are hard of hearing may appear to be confused if they attempt to respond to a question that they did not hear correctly.
- **E = Exposure and environmental control:** Older adults may have less subcutaneous fat and lose body heat easily. Keep them covered and provide warming as indicated.

### REFERENCES

1. American College of Surgeons (ACS). (2018). Chapter 6: Head trauma. In *Advanced trauma life support: Student course manual* (10th ed., pp. 102-126). Chicago: ACS. ([Level VII](#))
2. American Heart Association. (AHA). (2016). Part 5: BLS for infants and children. In *Basic life support: Provider manual* (pp. 45-56). Dallas, TX: AHA. ([Level VII](#))



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3. Institute of Neurological Sciences. (2015). GCS: Eyes, Motor, Verbal. Glasgow coma scale: Do it this way. Retrieved March 10, 2020, from <https://www.glasgowcomascale.org/downloads/GCS-Assessment-Aid-English.pdf?v=3>
4. Powers-Jarvis, R. (2020). Initial assessment. In *TNCC™: Trauma nursing core course—provider manual* (8th ed., pp. 25-43). Schaumburg, IL: Emergency Nurses Association. ([Level VII](#))
5. Wijdicks, E.F. and others. (2005). Validation of a new coma scale: The FOUR score. *Annals of Neurology*, 58(4), 585-593. doi:10.1002/ana.20611 (classic reference)\* ([Level VI](#))

### ADDITIONAL READINGS

Teasdale, G., Jennett, B. (1974). Assessment of coma and impaired consciousness: A practical scale. *The Lancet*, 2(7872), 81-84. doi:10.1016/S0140-6736(74)91639-0 (classic reference)\*

\*In these skills, a “classic” reference is a widely cited, standard work of established excellence that significantly affects current practice and may also represent the foundational research for practice.

### Elsevier Skills Levels of Evidence

- **Level I** - Systematic review of all relevant randomized controlled trials
- **Level II** - At least one well-designed randomized controlled trial
- **Level III** - Well-designed controlled trials without randomization
- **Level IV** - Well-designed case-controlled or cohort studies
- **Level V** - Descriptive or qualitative studies
- **Level VI** - Single descriptive or qualitative study
- **Level VII** - Authority opinion or expert committee reports

### SUPPLIES

- PPE (gloves; mask, eye protection, and fluid-resistant gown if indicated)
- Flashlight
- Towel rolls, foam blocks, or other head support devices (for trauma patients)
- Stethoscope
- Other equipment as indicated for resuscitative procedures
- Blanket

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