

Emergency Secondary Assessment (Pediatric) - CE

ALERT

Do not begin the secondary assessment until the primary assessment is complete and resuscitation procedures are initiated based on the findings of the primary assessment.

Immediately stop the secondary assessment and address any life-threatening conditions if the child's condition deteriorates.

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

OVERVIEW

The secondary assessment is a rapid and systematic assessment of an injured child from head to toe to identify all injuries, or a rapid and systematic assessment of a child who is seriously ill when the cause of signs and symptoms is unclear.¹

There are two major components of the secondary assessment: the focused history and the focused physical assessment, both based on the presenting signs and symptoms.

CHILD AND FAMILY EDUCATION

- Provide individualized, developmentally appropriate education to the family and child based on the desire for knowledge, readiness to learn, and overall neurologic and psychosocial state.
- Explain the secondary assessment, including the steps and rationale.
- Explain how the child and family can assist with the procedure.
- Instruct the child (as developmentally appropriate) to avoid moving until a spinal cord injury has been ruled out. Instruct the family not to move the child.
- Explain that if the child feels pain during the procedure, it will be addressed.
- Explain that the child may feel anxiety during the procedure.
- Encourage questions and answer them as they arise.

ASSESSMENT AND PREPARATION

Child and Family Assessment

1. Ensure that the primary assessment is complete and interventions have been initiated for life-threatening conditions.
2. Proceed immediately to the next step if already wearing personal protective equipment (PPE), including gloves and—if indicated—a mask, eye protection, and fluid-resistant gown. Otherwise, perform hand hygiene and don appropriate PPE before proceeding with the secondary assessment.

Preparation

1. If the child is at risk for spinal injury, ensure that spinal motion restriction is maintained throughout each step of the primary and secondary assessments.

Emergency Secondary Assessment (Pediatric) - CE

PROCEDURE

1. Perform the secondary assessment using a systematic approach to ensure that no step is forgotten. The steps below follow the mnemonic F-G-H-I-J (to continue the primary assessment mnemonic, A-B-C-D-E):²

F = full set of vital signs and family presence

G = get monitoring devices and give comfort (using the mnemonic L-M-N-O-P)

H = history and head-to-toe assessment (using the mnemonic S-A-M-P-L-E)

I = inspect posterior surfaces

J = just keep reevaluating

F = Full Set of Vital Signs and Family Presence

2. Obtain the child’s vital signs, including pulse, respirations, temperature, blood pressure, oxygen saturations, and end-tidal carbon dioxide levels, as indicated.

3. Compare vital sign values obtained to the normal range for vital signs by age.

Heart and respiratory rates may be altered by fear, pain, and anxiety, or by physiologic problems such as hypoxia and hypovolemia.

Do not rely on blood pressure alone to assess perfusion. Children can maintain a normal blood pressure in the presence of significant hypovolemia. Assess perfusion with level of consciousness, heart rate, capillary refill, skin color, and pulses.

Immediately stop the secondary assessment and address any life-threatening conditions if the child’s condition deteriorates. Return to the primary assessment and intervene before returning to the secondary assessment.

Age	Awake heart rate (bpm)	Sleeping heart rate (bpm)
Neonate	100–205	90–160
Infant	100–180	90–160
Toddler	98–140	80–120
Preschooler	80–120	65–100
School-age child	75–118	58–90
Adolescent	60–100	50–90

*Always consider the child’s normal range and clinical condition. Heart rate normally increases with fever or stress.

(From Hazinski, M.F. [Ed.]. [2013]. *Nursing care of the critically ill child* [3rd ed.]. St. Louis: Mosby.)

Age	Rate (breaths/min)
Infant	30–53

Emergency Secondary Assessment (Pediatric) - CE

Toddler	22–37
Preschooler	20–28
School-age child	18–25
Adolescent	12–20

*Consider the child’s normal range. The child’s respiratory rate is expected to increase in the presence of fever or stress.

(From Hazinski, M.F. [Ed.]. [2013]. *Nursing care of the critically ill child* [3rd ed.]. St. Louis: Mosby.)

Age	Systolic pressure (mm Hg)*	Diastolic pressure (mm Hg)*	Mean arterial pressure (mm Hg)†	Systolic hypotension (mm Hg)‡
Birth (12 hr, <1000 gm)	39–59	16–36	28–42§	<40–50
Birth (12 hr, 3 kg)	60–76	31–45	48–57	<50
Neonate (96 hr)	67–84	35–53	45–60	<60
Infant (1–12 months)	72–104	37–56	50–62	<70
Toddler (1–2 yr)	86–106	42–63	49–62	<70 + (2 × age in years)
Preschooler (3–5 yr)	89–112	46–72	58–69	<70 + (2 × age in years)
School-age child (6–7 yr)	97–115	57–76	66–72	<70 + (2 × age in years)
Preadolescent (10–12 yr)	102–120	61–80	71–79	<90
Adolescent (12–15 yr)	110–131	64–83	73–84	<90

*Systolic and diastolic blood pressure ranges assume 50th percentile for height for children 1 year of age and older, and are consistent with the Pediatric Advanced Life Support Course (Chameides, L. and others. [2011]. *Pediatric advanced life support: Provider manual*. Dallas: American Heart Association).

†Mean arterial pressures (diastolic pressure + [difference between systolic and diastolic pressures ÷ 3]) for children 1 year of age and older, assuming 50th percentile for height.

‡Threshold for hypotension in children 1 to 10 years of age from the Pediatric Advanced Life Support Course (Chameides, L. and others. [2011]. *Pediatric advanced life support: Provider manual*. Dallas: American Heart Association).

§Approximately equal to postconception age in weeks (may add 5 mm Hg).

(From Hazinski, M.F. [Ed.]. [2013]. *Nursing care of the critically ill child* [3rd ed.]. St. Louis: Mosby. Data from Gemelli, M. and others. [1990]. Longitudinal study of blood pressure during the 1st year of life.

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Emergency Secondary Assessment (Pediatric) - CE

4. If the child's condition requires invasive or resuscitative measures, assign a staff member or support person to provide the family with support and explanations about what is occurring.

G = Get Monitoring Devices and Give Comfort

5. Follow the mnemonic L-M-N-O-P when obtaining resuscitation monitoring devices and supports.

a. *L = Laboratory Studies*: Send appropriate specimens to the laboratory for analysis and obtain a point-of-care glucose.

b. *M = Monitoring*: Place the child on a cardiopulmonary monitor.

c. *N = Nasogastric or Orogastric Tube*: Insert a gastric tube, if needed.

d. *O = Oxygenation and Ventilation* (SpO₂, End-Tidal Carbon Dioxide [ETCO₂]):

i. Monitor oxygenation by implementing pulse oximetry (if not performed previously).

Remember that pulse oximetry is a measurement of SpO₂ and is not evidence of ventilation. An SpO₂ of 94% or greater is considered adequate oxygenation.

Do not rely on pulse oximetry readings in a child with poor perfusion; they may not be accurate. Assess the quality of the plethysmographic waveform if there is any doubt.

ii. Assess ventilation by monitoring ETCO₂ levels via capnography. Normal values range from 35 to 45 mm Hg.

e. *P = Pain Assessment and Management*: Assess the child for pain, using a developmentally appropriate, validated pain assessment scale.

H = History and Head-to-Toe Assessment

6. Obtain a focused history using the SAMPLE mnemonic:³

Signs and symptoms: onset and nature, such as difficulty breathing, fever, or pain

Allergies: medications, foods, environmental, substances (e.g., latex), including reactions (e.g., rash, anaphylaxis)

Medications: prescription, over the counter, herbal; dose, times, duration, missed doses; ask about alcohol or substance use.

Past medical: illnesses, hospitalizations, surgeries, immunizations, birth history, relevant family history

Last oral intake and Last menstrual period: usual diet; time and nature of last intake; if of childbearing age obtain the last menstrual period

Events: regarding current illness or injury; mechanism of injury; treatment before arrival

7. Begin the head-to-toe assessment

Emergency Secondary Assessment (Pediatric) - CE

Head and Face

- a. Inspect for wounds, deformities, swelling, asymmetry, discolorations, and bloody or serous drainage from the nose or ears.
- b. Palpate the entire head and face for swelling, deformities, and tenderness; palpate the fontanels in infants.
- c. In a conscious and cooperative child, evaluate extraocular movements, gross vision, and dental occlusion.
- d. Identify any unusual odors, such as gasoline, fruity breath, or ethanol.

Neck

- a. If the child is wearing a cervical collar, remove the anterior portion as an assistant maintains manual stabilization of the head and neck.
- b. Inspect the anterior neck for wounds, jugular venous distention, lymphadenopathy, discolorations, deformities, and the use of accessory muscles for breathing.
- c. Palpate the anterior neck for deformities, subcutaneous emphysema, tenderness, or tracheal deviation (best palpated in the notch above the manubrium).
- d. Gently palpate the posterior neck from the base of the skull to the upper back for deformities, bony crepitus, or tenderness.
- e. Replace the cervical collar when the examination is complete.

Chest

- a. Inspect for signs of increased work of breathing (e.g., accessory muscle use, retractions), wounds, scars, deformities, discolorations, chest expansion, symmetry, impaled objects, paradoxical movement, and surgically implanted devices, such as venous access devices.
- b. Palpate the anterior and lateral chest for deformities, tenderness, subcutaneous emphysema, or bony crepitus.
- c. Auscultate breath sounds to determine whether they are present and equal bilaterally; identify any adventitious sounds, such as crackles and wheezing.
- d. Auscultate heart sounds to determine rate and rhythm and whether the sounds are clear or muffled; identify the presence of any murmurs, gallops, or friction rubs.

Abdomen and Flanks

- a. Inspect for wounds, discolorations, distention, or surgically implanted devices, such as feeding tubes.
- b. Auscultate all quadrants for the presence of bowel sounds.
- c. Gently palpate the abdomen for tenderness, guarding, rigidity, or masses.

Palpate the areas that are known to be painful last to facilitate the child's cooperation.

Emergency Secondary Assessment (Pediatric) - CE

If the child is uncooperative with palpation of the abdomen, assess for rigidity by palpating the abdomen when the child inhales, which relaxes the abdominal muscles.

Unilateral pain is a significant finding.

Pelvis and Perineum

- a. Inspect the perineum for wounds; deformities; discolorations; or bleeding from the urinary meatus, vagina, or rectum.
- b. Palpate for pelvic tenderness, crepitus, or instability by gently pressing in on the anterior superior iliac crests bilaterally and gently pushing down on the pubic symphysis.

If there is crepitus or instability when assessing the anterior superior iliac crests, do not assess the symphysis pubis.

Extremities

- a. Inspect all extremities for wounds, deformities, swelling, discolorations, positioning, or abnormal movement.
- b. Palpate all extremities for tenderness, deformities, skin temperature and moisture, and distal pulses.
- c. If the child is conscious, determine gross motor and sensory function.

I = Inspect Posterior Surfaces

8. If the child is able, have him or her sit up or roll over.
9. If the mechanism of injury indicates a suspicion for a spinal cord injury, obtain assistance to maintain cervical spinal motion restriction and support the injured extremities while log rolling the child to the side.

There is evidence that the log roll maneuver can result in spinal movement. Carefully consider the risks and benefits of performing this maneuver, especially if the potential for spinal cord injury is significant. When spinal or pelvic injuries are suspected, radiographs are recommended before logrolling the child.

10. Inspect the posterior surfaces for wounds, deformities, or discolorations.
11. Palpate all posterior surfaces for wounds, deformities, bony crepitus, tenderness, or muscle spasms.
12. If the child is on a long spine board, remove it as indicated.

J = Just Keep Reevaluating

13. Continue ongoing monitoring and evaluation of the child. Reevaluation should include the primary survey, vital signs, level of pain and any injuries identified. A helpful mnemonic is V-I-P-P:

V = vital signs

Emergency Secondary Assessment (Pediatric) - CE

I = injuries sustained and interventions

P = primary survey

P = level of pain

14. Remove personal protective equipment (PPE) and perform hand hygiene.

15. Document the procedure in the child's record.

MONITORING AND CARE

1. Frequently reassess the child's airway, breathing, and circulation, as well as any areas of abnormalities, to identify changes and possible deterioration in the child's condition.
2. Perform frequent monitoring of vital signs.
3. Assess, treat, and reassess pain.
4. Anticipate and plan for procedures, diagnostic tests, consultations, and transfers based on the findings from the secondary assessment.

EXPECTED OUTCOMES

- A complete systematic assessment is performed on a child in whom the cause of signs and symptoms is unclear.
- All injuries and abnormalities are identified.

UNEXPECTED OUTCOMES

- Failure to recognize and intervene appropriately in life-threatening conditions that develop or worsen, resulting in the child's condition deteriorating
- Intervention for noncritical problems, such as extremity fractures, before correcting life-threatening conditions, resulting in the child's condition deteriorating

DOCUMENTATION

- Conditions found, including pertinent positive and negative findings
- Interventions performed to address life-threatening conditions and the child's response to interventions
- Interventions performed to address any non-life-threatening conditions and the child's response to interventions
- Child and family education
- Unexpected outcomes and related nursing interventions

REFERENCES

1. Emergency Nurses Association (ENA). (2020). *Emergency nursing pediatric course: Provider manual*. (5th ed.) Burlington, MA: Jones and Bartlett Learning.
2. Emergency Nurses Association (ENA). (2015). Long backboard use for spinal motion restriction. Retrieved March 10, 2020, from [https://www.ena.org/docs/default-source/resource-library/practice-resources/translation-into-practice/longbackboardusespinalmotionrestriction_\(Level_VII\)](https://www.ena.org/docs/default-source/resource-library/practice-resources/translation-into-practice/longbackboardusespinalmotionrestriction_(Level_VII))

Emergency Secondary Assessment (Pediatric) - CE

3. Fuchs, S.M. and others. (2016). Definitions and assessment approaches for emergency medical services for children. *Pediatrics*, 138(6), Art. No. e20161073.
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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 a fluid-resistant gown)
- Blanket
- Cardiopulmonary monitor
- Stethoscope
- Thermometer
- Blood pressure cuff or noninvasive blood pressure monitor
- Flashlight or penlight
- IV fluid warmer (optional)
- Length-based resuscitation tape
- Other equipment, as indicated, for resuscitative and palliative procedures with a range of sizes appropriate for children of all ages
- Pulse oximeter
- Trauma scissors to cut clothing as needed
- Warming lights (optional)

Clinical Review: Marlene L. Bokholdt, MS, RN, CPEN, TCRN, CEN

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