Chapter 7 - Life Span Development

1. National EMS Education Standard Competencies (1 of 2)
   Preparatory
   Applies fundamental knowledge of the emergency medical services (EMS) system; safety/well-being of the emergency medical technician (EMT), medical/legal, and ethical issues to the provision of emergency care.

2. National EMS Education Standard Competencies (2 of 2)
   Life Span Development
   Applies fundamental knowledge of life span development to patient assessment and management.

3. Introduction
   • Humans develop throughout their lives.
   • EMTs must be aware of the physical changes a person undergoes at various stages of life.
     – May affect the approach to patient care

4. Neonates & Infants (1 of 10)
   • Neonates
     – Birth to 1 month
   • Infants
     – 1 month to 1 year
     – Develop at a startling rate

5. Neonates & Infants (2 of 10)
   • Vital signs
     – At birth, pulse rate is 90 to 180 beats/min and respiratory rate is 30 to 60 breaths/min
     – Shortly after birth, pulse rate drops to 100 to 160 beats/min and respiratory rate slows to 25 to 50 breaths/min.
     – By 1 year, respiratory rate slows to 20 to 30 breaths/min.

6. Neonates & Infants (3 of 10)
   • Blood pressure
     – Directly corresponds to the patient’s weight
     – Typically increases with weight
   • Weight
     – Neonate weighs 6 to 8 lb (3 to 3.5 kg) at birth.
     – Growth of about 1 oz per day
     – Weight triples by the end of the first year

7. Neonates & Infants (4 of 10)
   • Cardiovascular system
     – At birth, neonate makes transition from fetal to independent circulation.
   • Pulmonary system
     – Infants younger than 6 months are prone to nasal congestion.
     – Infants have larger tongues and shorter, narrower airways, so airway obstruction is more common than in older children or adults.

8. Neonates & Infants (5 of 10)
   • Nervous system
     – Evolution continues after birth
     – Moro reflex: neonate opens arms wide, spreads fingers, and seems to grab at things
     – Palmar grasp: occurs when an object is placed into the neonate’s palm
     – Rooting reflex: neonate instinctively turns head when something touches its cheek
     – Sucking reflex: Occurs when a neonate’s lips are stroked

9. Neonates & Infants (6 of 10)
   • Fontanelles
     – Spaces between the bones that eventually fuse to form the skull
     – Posterior fontanelle fuses by 3 months.
     – Anterior fontanelle fuses between age 9 and 18 months.
   • Infant’s immune system maintains some of the mother’s immunities.

10. Neonates & Infants (7 of 10)
11. Neonates & Infants (8 of 10)
   • Psychosocial changes
     – Begin at birth and evolve as the infant interacts with the environment

12. Neonates & Infants (9 of 10)
   • Psychosocial changes (cont’d)
     – Crying is the main method of communicating distress.
     – Infants develop relationships with their parents or caregivers at different rates.

13. Neonates & Infants (10 of 10)
   • Psychosocial changes (cont’d)
     – Bonding is based on a secure attachment.
     – Anxious-avoidant attachment is found in infants who are repeatedly rejected.
     – Separation anxiety is common in older infants.
     – Trust and mistrust involves an infant’s needs being met.

14. Toddlers and Preschoolers
    (1 of 4)
    • Toddlers (1 to 3 years)
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- Pulse: 90 to 150 beats/min
- Respiratory rate: 20 to 30 breaths/min
- Systolic blood pressure: 80 to 100 mm Hg
- Temperature: 96.8°F to 99.6°F

Toddlers and Preschoolers
(2 of 4)

Toddlers and Preschoolers
(3 of 4)
- Preschoolers (cont’d)
  - Weight gain should level off.
  - Passive immunity is lost.
  - Toddlers acquire immunity as their bodies are exposed to various viruses and germs.
  - Neuromuscular growth also makes considerable progress at this age.
  - Average age for completion of toilet training is 28 months.

Toddlers and Preschoolers
(4 of 4)
- Psychosocial changes
  - Learn to speak and express themselves
  - Master basic language
  - Interact and play games with other children
  - Begin to understand cause and effect
  - Learn to recognize gender differences by observing role models

School-Age Children (1 of 3)
- 6 to 12 years
- Vital signs approach those in adulthood.
  - Pulse: 70 to 120 beats/min
  - Respiration rate: 15 to 20 breaths/min
  - Systolic blood pressure: 80 to 110 mm Hg

School-Age Children (2 of 3)
- Obvious physical traits and body function changes become apparent.
- Growth of 4 lb and 2.5" each year
- Permanent teeth come in.
- Brain activity increases in both hemispheres.

School-Age Children (3 of 3)
- Psychosocial changes
  - Preconventional reasoning: children act to avoid punishment and get what they want
  - Conventional reasoning: children look for approval from peers and society
  - Postconventional reasoning: children make decisions guided by their conscience.
  - Self-concept and self-esteem develop.

Adolescents (Teenagers) (1 of 4)
- 12 to 18 years
- Vital signs level off.
  - Pulse: 60 to 100 beats/min
  - Respirations: 12 to 20 breaths/min
  - Systolic blood pressure: 90 to 110 mm Hg

Adolescents (Teenagers) (2 of 4)
- 2- to 3-year growth spurt.
  - Girls finish by 16 years; boys by 18 years.
  - Reproductive system matures.
  - Secondary sexual development takes place.
  - Voices start to change.
  - Menstruation begins.
  - Acne can occur.

Adolescents (Teenagers) (3 of 4)
- Psychosocial changes
  - Adolescents and their families often deal with conflict.
  - Privacy becomes an issue.
  - Self-consciousness increases.
  - Adolescents may struggle to create their own identity.

Adolescents (Teenagers) (4 of 4)
- Psychosocial changes (cont’d)
  - Antisocial behavior and peer pressure peak at age 14 to 16 years.
  - Smoking, illicit drug use, unprotected sex
  - Eating disorders
  - Code of ethics develops.
  - High risk of suicide and depression

Early Adults (1 of 2)
- 19 to 40 years
- Vital signs do not vary greatly.
  - Pulse: 60 to 100 beats/min
  - Respiratory rate: 12 to 20 breaths/min
  - Systolic blood pressure: 90 to 140 mm Hg
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27 Early Adults (2 of 2)
• From age 19 to 25 years, the body should be functioning at its optimal level.
  – Lifelong habits are solidified.
• Psychosocial changes
  – Life centers on work, family, and stress.
  – Settling down, marriage, and family
  – One of the more stable periods of life

28 Middle Adults (1 of 3)
• 41 to 60 years
• Vital signs remain the same.
  – Pulse: 60 to 100 beats/min
  – Respiratory rate: 12 to 20 breaths/min
  – Systolic blood pressure: 90 to 140 mm Hg

29 Middle Adults (2 of 3)
• Vulnerable to vision and hearing loss
• Cancer incidence increases.
• Menopause occurs in late 40s or early 50s.
• Diabetes, hypertension, and weight problems are common.
• Exercise and healthy diet can diminish the effects of aging.

30 Middle Adults (3 of 3)
• Psychosocial changes
  – Focus on achieving life goals
  – Readjust lifestyle as children leave home
  – Generally have the physical, emotional, and spiritual reserves to handle life’s issues
  – May be caring for both children leaving for college and aging parents

31 Older Adults (1 of 15)
• 61 years and older
• Life expectancy is constantly changing.
  – Now approximately 78 years

32 Older Adults (2 of 15)
• Vital signs depend on the patient’s:
  – Overall health
  – Medical conditions
  – Medications taken
• Older adults are often able to overcome numerous medical problems but may need multiple medications.

33 Older Adults (3 of 15)
• Cardiovascular system
  – Declines with age largely due to atherosclerosis
  – Heart rate and cardiac output decrease.
  – Vascular system becomes stiff.
  – Ability to produce replacement blood cells declines, as does blood volume.

34 Older Adults (4 of 15)
• Respiratory system
  – Size of airway increases.
  – Surface area of alveoli decreases.
  – Natural elasticity of the lungs decreases.
  – Intercostal muscles are used more to breathe.
  – Breathing becomes more labor intensive.

35 Older Adults (5 of 15)
• Respiratory system (cont’d)
  – Aspiration and obstruction become more likely.
  – By age 75 years, vital capacity may amount to only 50% of a young adult’s vital capacity.
  – Loss of respiratory muscle mass
  – Increased stiffness of the thoracic cage
  – Decreased surface area available for the exchange of air
  – Residual volume increases.

36 Older Adults (6 of 15)
• Endocrine system
  – Insulin production drops off.
  – Metabolism decreases.
  – People tend to slow down their physical activity but do not decrease their food intake.
  – The reproductive system changes to some extent.

37 Older Adults (7 of 15)
• Endocrine system (cont’d)
  – Men are able to produce sperm, but the rigidity of their penis decreases over time.
  – Women have a decrease in the size of their uterus and vagina.
  – Hormone production for both sexes gradually decreases.
  – Sexual desire may diminish but does not cease.

38 Older Adults (8 of 15)
• Digestive system
  – Taste sensations decrease.
– Saliva secretion decreases.
– Ability of the intestines to contract and move food diminishes.
– Gallstones become increasingly common.
– Anal sphincter changes can produce fecal incontinence.

Older Adults (9 of 15)
• Renal system
  – Filtration function declines.
  – Kidney mass decreases by 20%.
  – Decreased ability to clear wastes from the body
  – Decreased ability to conserve fluids when needed

Older Adults (10 of 15)
• Nervous system
  – Motor and sensory neural networks become slower.
  – Neurons are lost but there is no loss of knowledge or skill.
  – Sleep patterns change.

Older Adults (11 of 15)
• Nervous system (cont’d)
  – Age-related shrinkage creates a void between the brain and the outermost layer of the meninges.

Older Adults (12 of 15)
• Nervous system (cont’d)
  – Peripheral nerve sensation is diminished.
  – Increased reaction times cause longer delays between stimulation and motion.
  – Slowdown in reflexes and decreased kinesthetic sense may contribute to falls and trauma.

Older Adults (13 of 15)
• Sensory changes
  – Most older adults can see and hear well.
  – May need glasses or hearing aids
  – Visual distortions are common.
  – Hearing loss is four times more common than vision loss.

Older Adults (14 of 15)
• Psychosocial changes
  – Until about 5 years before death, most people retain high brain function.
  – Statistics indicate that 95% of the elderly live at home.
  – Financial limits may restrict access to health care or medications.

Older Adults (15 of 15)
• Psychosocial changes (cont’d)
  – More than 50% of all single women in the United States who are 60 years of age or older are living at or below the poverty line.
  – Elderly need to face their own mortality.
  – Isolation and depression can be challenges.

Review
1. When providing bag-mask ventilations to an infant, what is most important to remember?
   A. Blood pressure typically increases with age.
   B. An infant’s lungs are fragile.
   C. An infant grows at a rate of about 30 g per day.
   D. An infant has a proportionately larger tongue than an adult.

Answer: B
Rationale: It is important to remember that an infant’s lungs are fragile; ventilations that are too forceful can result in trauma from pressure, or barotrauma. Due to the large size of the infant’s occiput and the increased flexibility of the trachea, the airway can easily be inadvertently occluded by incorrect positioning, either overextension or overflexion.

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Rationale: This is not crucial information when giving ventilations.

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Rationale: The large tongue could occlude the airway, but it is more important to remember the fragility of the lungs.

Review
2. You see an infant capable of reaching out to people and drooling. She is most likely:
   A. 2 months of age.
   B. 3 months of age.
   C. 4 months of age.
   D. 5 months of age.

Answer: C
Rationale: An infant’s psychosocial development begins at birth and continues to evolve as the infant interacts with, and reacts to, the environment. At 4 months of age, an infant is likely to start reaching out to people and drooling.
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52 [Review]
2. You see an infant capable of reaching out to people and drooling. She is most likely:
   A. 2 months of age.
   Rationale: Psychosocial development at this age involves recognizing familiar faces.
   B. 3 months of age.
   Rationale: Psychosocial development involves bringing objects to the mouth.
53 [Review]
2. You see an infant capable of reaching out to people and drooling. She is most likely:
   C. 4 months of age.
   Rationale: Correct answer
   D. 5 months of age.
   Rationale: Psychosocial development involves sleeping through the night.
54 [Review]
3. An infant who is repeatedly rejected experiences what type of attachment?
   A. Secure attachment
   Rationale: An infant understands that parents or caregivers will be responsive to his or her needs.
   B. Anxious-avoidant attachment
   Rationale: Correct answer
   C. Trust and mistrust
   Rationale: An infant’s needs are met by his or her parents or caregivers.
   D. Rejection attachment
   Rationale: Not a real type of attachment.
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56 [Review]
4. Why do colds develop so easily in toddlers and preschoolers?
   A. They experience a loss of passive immunity.
   B. They do not have well-developed lung musculature.
   C. They are spending a lot of time around playmates and classmates.
   D. All of the above
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   C. They are spending a lot of time around playmates and classmates.
   D. All of the above
58 [Review]
5. The pulse rate of a toddler is:
   A. 80 to 140 beats/min
   B. 90 to 150 beats/min
   C. 90 to 180 beats/min
   D. 100 to 160 beats/min
59 [Review]
5. The pulse rate of a toddler is:
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60 [Review]
5. The pulse rate of a toddler is:
   A. 80 to 140 beats/min.
   Rationale: The pulse rate of a preschool-age child is 80 to 140 beats/min.
   B. 90 to 150 beats/min.
   Rationale: Correct answer
   C. 90 to 180 beats/min
   Rationale: The pulse rate of a neonate is 90 to 180 beats/min.
   D. 100 to 160 beats/min
   Rationale: A toddler’s pulse rate is 90 to 150 beats/min.
61 [Review]
5. The pulse rate of a toddler is:
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65 Review
6. A school-age child looking for approval from his peers and society is demonstrating what kind of reasoning?
   A. Preconventional reasoning
   B. Conventional reasoning
   C. Postconventional reasoning
   D. Trust and mistrust

Answer: B
Rationale: During school-age development, children begin to develop their self-concept and self-esteem. It is a critical time in human development. Children who look for approval from their peers and society are demonstrating conventional reasoning.

66 Review
6. A school-age child looking for approval from his peers and society is demonstrating what kind of reasoning?
   A. Preconventional reasoning
   B. Conventional reasoning
   C. Postconventional reasoning
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Rationale: Children act almost purely to avoid punishment and to get what they want.

Answer: B
Rationale: Correct answer

67 Review
6. A school-age child looking for approval from his peers and society is demonstrating what kind of reasoning?
   A. Preconventional reasoning
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Rationale: Children make decisions guided by their conscience.

Answer: C
Rationale: Postconventional reasoning

68 Review
7. Self-concept is:
   A. our perception of ourselves.
   B. how we feel about ourselves.
   C. how we fit in with peers.
   D. how we react to certain situations.

Answer: A
Rationale: Self-concept is how we perceive ourselves.

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Rationale: Correct answer

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70 Review
8. Why should you be concerned about a 16-year-old patient who seems depressed?
   A. She could be exhibiting rebellious behavior.
   B. She has just finished her growth spurt and may be disappointed in the results.
   C. Adolescents are at a higher risk for suicide.
   D. She may be having unprotected sex.

Answer: C
Rationale: Adolescents are struggling to create their own identity, but are caught between two worlds. They want to be treated like adults yet want to be cared for like younger children. Many adolescents are fixated on their public image and are terrified of being embarrassed. Because of all these factors, adolescents are at a higher risk than other populations for suicide and depression.

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   D. She may be having unprotected sex.

Answer: C
Rationale: Peer pressure among adolescents could cause such rebellious behavior, but depression is not proof of such activity.

74 Review
9. Why do finances become an issue during middle adulthood?
   A. Middle adults are often supporting both their children and their parents.
   B. Middle adults make less money than early adults.
   C. Their deteriorating health makes it difficult to get to work.
   D. Hearing loss prevents them from working.

Answer: A
Rationale: The parents of adults in this age group are getting older and now need care. Most of the elderly in the United States are cared for by family members
inside the home. Therefore, a person in middle adulthood may need to manage children who are leaving for college while at the same time caring for parents who require greater assistance.

**Review**

9. Why do finances become an issue during middle adulthood?
   A. Middle adults are often supporting both their children and their parents.
      Rationale: Correct answer.
   B. Middle adults make less money than early adults.
      Rationale: This statement has no evidentiary support.

10. Why is breathing more labor intensive for the elderly?
    A. The size of the airway increases and the surface area of the alveoli decreases.
    B. The natural elasticity of the lungs decreases.
    C. The overall strength of the intercostal muscles and the diaphragm decreases.
    D. All of the above.
    Rationale: All three of these factors make breathing more labor intensive for the elderly.
    Answer: D

**Review**

10. Why is breathing more labor intensive for the elderly?
    A. The size of the airway increases and the surface area of the alveoli decreases.
    Rationale: Breathing becomes more difficult when the alveoli can no longer exchange gases.
    B. The natural elasticity of the lungs decreases.
    Rationale: This forces individuals to use the muscles between their ribs to breathe, which makes breathing more difficult.
    C. The overall strength of the intercostal muscles and the diaphragm decreases.
    Rationale: Breathing becomes more difficult when these muscles are weakened.
    D. All of the above.
    Rationale: Correct answer.