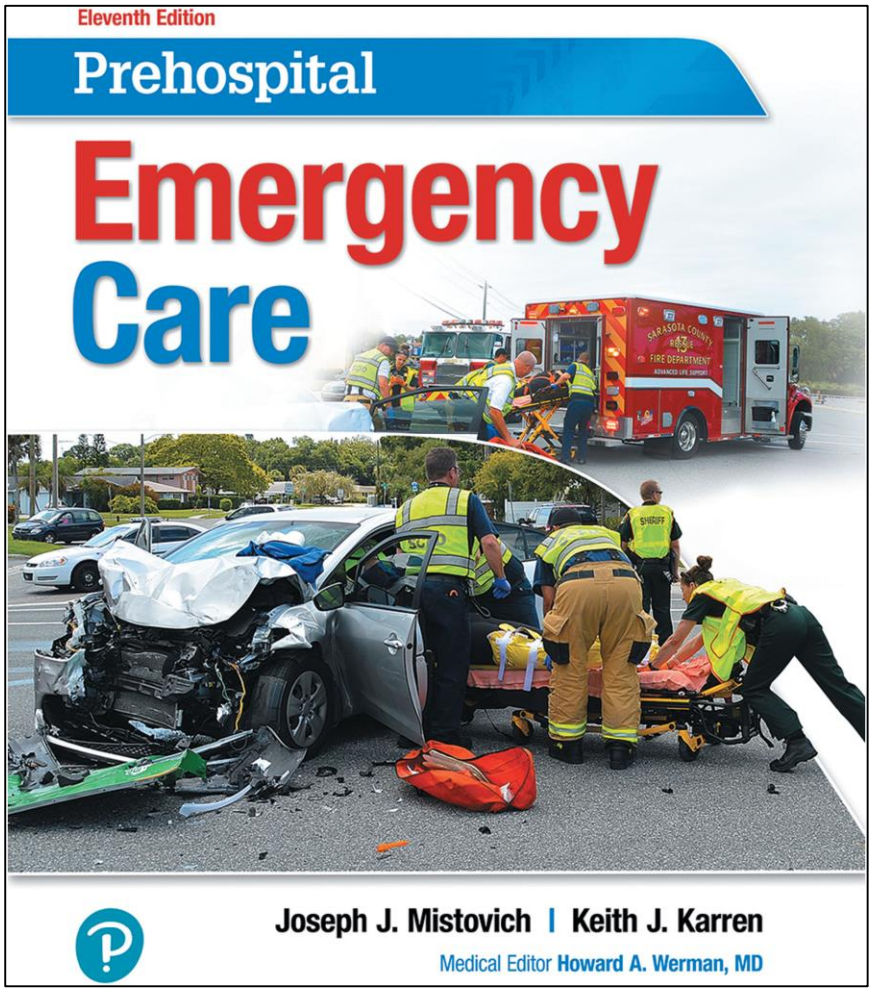
Prehospital: Emergency Care

Eleventh Edition



Chapter 9

Life Span Development

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Introduction

- People change physically and psychosocially throughout their lifetimes.
- EMTs must be able to incorporate knowledge of each stage into patient assessment and management.

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Life Span Development (1 of 41)

- Vital signs change throughout the life span.

Table 9-1 Average Vital Signs

Age	Awake Heart Rate Range per Minute	Normal Breathing Rate per Minute
Adult	60–100	12–20
Adolescent (12 to 15 years)	60–100	12–20
School-aged Child (6 to 11 years)	75–118	18–25
Preschooler (3 to 5 years)	80–120	20–28
Toddler (1 to 2 years)	98–140	22–37
Infant (1 month to 12 months)	100–180	30–53
Neonate (birth to 1 month)	100–205	40–60

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Life Span Development (2 of 41)

Age	Systolic BP (mmHg)	Diastolic BP (mmHg)
Adult	120 or less	80 or less
Adolescent (12 to 15 years)*	110–131	64–83
Preadolescent (10 to 12 years)*	102–120	61–80
School-aged (6 to 9 years)*	97–115	57–76
Preschooler (3 to 5 years)*	89–112	46–72
Toddler (1 to 2 years)*	86–106	42–63
Infant (1 to 12 months)*	72–104	37–56
Neonate (Birth to 1 month)*	67–84	35–53

* According to the American Heart Association and American Academy of Pediatrics Pediatric Advanced Life Support 2016

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Life Span Development (3 of 41)

- Neonates and Infants
  - A neonate is from birth to one month of age.
  - An infant is from one month to one year of age.
  - During this period, a child undergoes rapid growth and development.

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A Newborn Infant (Neonate)

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A 12-Month-Old Infant

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Life Span Development (4 of 41)

- Neonates and Infants
  - Vital Signs – At Birth
    - Respiratory rate 40–60/min at birth, decreasing to 30–40/min within minutes
    - Tidal volume 6–8 mL/kg
    - Heart rate 140–160/min at birth, decreasing to 100–160/min in minutes
    - Systolic BP averages about 70 mmHg
    - Temperature 98 °F to 100 °F

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Life Span Development (5 of 41)

- Neonates and Infants
  - Vital Signs - By age 1 year
    - Respiratory rate 20–30/min
    - Tidal volume 10–15 mL/kg
    - Heart rate 120/min
    - Systolic BP 90 mmHg
    - Temperature 98 °F to 100 °F

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Life Span Development (6 of 41)

- Neonates and Infants
  - Physiologic Changes
    - Average birth weight is 3.0–3.5 kg.
    - The head accounts for 25 percent of the body weight.
    - Birth weight drops 5–10 percent in the first two weeks.
    - Thereafter, the weight continues to increase.
    - Initial diet of breast milk or formula.

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Life Span Development (7 of 41)

- Neonates and Infants
  - Physiologic Changes
    - Primarily nose breathers until four weeks of age.
    - Airways are easily obstructed.
    - There are fewer alveoli and lung tissue is fragile.
    - The chest wall is soft with weak accessory muscles.

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Life Span Development (8 of 41)

- Neonates and Infants
  - Physiologic Changes
    - Fatigue can occur easily from respiratory distress.
    - Increased respirations can lead to dehydration and heat loss.
    - Immune system is immature; immunizations are important.
    - Infants have several important reflexes.
    - Extremity movement should be symmetrical.

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Life Span Development (9 of 41)

- Neonates and Infants
  - Physiologic Changes
    - Inability to localize pain.
    - Posterior fontanelle closes at three months.
    - Anterior fontanelle closes between nine and 18 months.
    - Examine the fontanelles for assessment of hydration.

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Life Span Development (10 of 41)

- Neonates and Infants
  - Psychologic Changes: **two-month milestones**
    - Track objects with eyes.
    - Focus on objects 8–12 inches away.
    - Recognize familiar faces.
    - Display primary emotions and facial expressions.
    - Recognize familiar sounds and voices.
    - Move in response to stimuli.

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Life Span Development (11 of 41)

- Neonates and Infants
  - Psychologic Changes: **six-month milestones**
    - Sit upright in a high chair.
    - Make one-syllable sounds (ma, mu, da, di).
    - Support upper body when on stomach.
    - Grasp and shake hand toys.
    - Follow moving objects with his eyes.
    - Recognize familiar objects at a distance.

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Life Span Development (12 of 41)

- Neonates and Infants
  - Psychologic Changes: **twelve-month milestones**
    - Sit without assistance and walk with help.
    - Know own name.
    - Crawl and creep on hands and knees.
    - Put objects into containers.
    - Poke objects with fingers.
    - Respond to simple requests and “no.”
    - Say “mama” or “dada.”

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Life Span Development (13 of 41)

- Neonates and Infants
  - Psychosocial Changes
    - Parents must meet the infant's physical, emotional, and psychological needs for healthy development.
    - Infants do not like to be separated from caregivers.
    - Infants communicate through crying.
    - Can detect and respond to parents' emotions.

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Life Span Development (14 of 41)

- Toddlers and Preschool-Age Children
  - A toddler is 1 to 3 years of age.
  - A preschooler 3 to 6 years of age.

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Life Span Development (15 of 41)

- Toddlers and Preschool-Age Children
  - Vital Signs - **Toddlers**
    - Heart rate 98–140/min
    - Respiratory rate 22–37/min
    - Systolic BP 86–106 mmHg
    - Temperature 98.6 °F–99.6 °F

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Life Span Development (16 of 41)

- Toddlers and Preschool-Age Children
  - Vital Signs - **Preschoolers**
    - Heart rate 80–120/min
    - Respiratory rate 20–28/min
    - Systolic BP 89–112mmHg
    - Temperature 98.6 °F–99.6 °F

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Life Span Development (17 of 41)

- Toddlers and Preschool-Age Children
  - Physiologic Changes
    - Increased body mass with decreased body fat.
    - Primary teeth have emerged.
    - Increased number of alveoli in the lungs.
    - Loss of passive immunity, but active immunity develops through exposure to pathogens.
    - Brain and motor skills develop quickly.

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Life Span Development (18 of 41)

- Toddlers and Preschool-Age Children
  - Physiologic Changes: **3-year milestones**
    - Walk alone and begin to run.
    - Pull or carry several toys when walking.
    - Climb up and down furniture or stairs with minimal support.
    - Scribble and play with toys.
    - Find hidden objects.
    - Sort objects by shape or color.

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Life Span Development (19 of 41)

- Toddlers and Preschool-Age Children
  - Physiologic Changes: **5-year milestones**
    - Stand on one foot for more than ten seconds.
    - Hop, jump, swing, climb, and do somersaults.
    - Dress and undress without assistance.
    - Count ten or more objects.
    - Trace and draw pictures.

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Life Span Development (20 of 41)

- Toddlers and Preschool-Age Children
  - Psychosocial Changes
    - Language develops.
    - Development of separation anxiety at about 18 months.
    - Playtime helps with social skills.
    - Speak at the child's level.
    - Allow him to touch equipment, if appropriate.

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Life Span Development (21 of 41)

- School-Age Children
  - A child between 6 and 12 years of age

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Life Span Development (22 of 41)

- School-Age Children
  - Vital Signs
    - Heart rate 75–118/min
    - Respiratory rate 18–25/min
    - Systolic BP 97–115 mmHg
    - Temperature 98.6 °F

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Life Span Development (23 of 41)

- School-Age Children
  - Physiologic Changes
    - Bones increase in density and grow large.
    - Primary teeth are replaced with permanent teeth.
    - Ability to read and write.
    - Nocturnal enuresis may continue after the age of 10.

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Life Span Development (24 of 41)

- School-Age Children
  - Psychosocial Changes
    - Friendships are important.
    - Problem-solving skills develop.
    - Self-concept, self-esteem, and morals develop.
    - Increased understanding of pain, illness, injury, and death.

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Life Span Development (25 of 41)

- Adolescence
  - Ages 12 to 18 years

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Life Span Development (26 of 41)

- Adolescence
  - Vital Signs
    - Heart rate 60–100/min
    - Respiratory rate 12–20/min
    - Systolic BP 110–131 mmHg
    - Temperature 98.6 °F

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Life Span Development (27 of 41)

- Adolescence
  - Physiologic Changes
    - Two- to three- year growth spurt
    - Girls finish growing by age 16, boys by age 18.
    - Puberty and reproductive maturity

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Life Span Development (28 of 41)

- Adolescence
  - Psychosocial Changes
    - Changes can result in family conflict.
    - Believe they are the focus of others' attention and have a feeling of invulnerability.
    - Desire to be treated as adults, but legally cannot make medical decisions.
    - Privacy is important.

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Life Span Development (29 of 41)

- Adolescence
  - Psychosocial Changes
    - Experimentation with alternate identities
    - Understand there are consequences for actions.
    - May engage in self-destructive behaviors; depression and suicide increase.
    - Concerned with body image.
    - May engage in sexual behavior.

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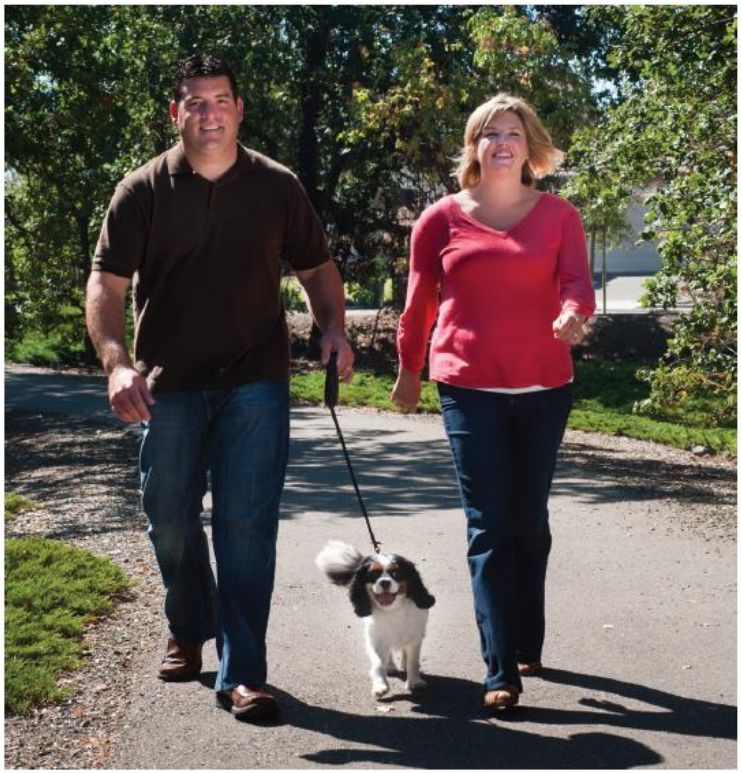
Life Span Development (30 of 41)

- Early Adulthood
  - Ages 20 to 40 years



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Life Span Development (31 of 41)

- Early Adulthood
  - Vital Signs
    - Heart rate 70/min
    - Respiratory rate 12–20/min
    - BP 120/80 mmHg
    - Temperature 98.6 °F

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Life Span Development (32 of 41)

- Early Adulthood
  - Physiologic Changes
    - Optimum function of body systems.
    - Physical peak between 19 and 26 years.
    - Accidents are the leading cause of death.

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Life Span Development (33 of 41)

- Early Adulthood
  - Psychosocial Changes
    - Increased responsibility and independence.
    - May marry and begin families.
    - Beginning careers, high levels of job stress.

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Life Span Development (34 of 41)

- Middle Adulthood
  - Age 41 to 60 years
  - Vital signs
    - Heart rate 70/min
    - Respiratory rate 12–20/min
    - BP 120/80 mmHg
    - Temperature 98.6 °F

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Life Span Development (35 of 41)

- Middle Adulthood
  - Physiologic Changes
    - Some decline in body systems and concerns with chronic disease.
    - Weight gain may occur.
    - Vision changes.
    - Women undergo menopause in their late 40s to 50s.

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Life Span Development (36 of 41)

- Middle Adulthood
  - Psychosocial Changes
    - Problems seen more as challenges than threats
    - More developed coping skills
    - Aware of time limits
    - Focus on others, rather than self
    - Transitions in parenting

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Life Span Development (37 of 41)

- Late Adulthood
  - Ages 61 years and older
  - Vital Signs
    - Depend on the underlying physical and health status

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Life Span Development (38 of 41)

- Late Adulthood
  - Physiologic Changes
    - Maximum life span is 120 years.
    - Life expectancy varies with year of birth.
    - Incidence of disease increases.
    - Cardiovascular system changes increase the myocardial workload.

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Life Span Development (39 of 41)

- Late Adulthood
  - Physiologic Changes
    - The brain becomes smaller, with some neuron loss.
    - There may be memory problems and disruption of sleep cycle.
    - Reaction time slows.
    - Respiratory system changes diminish ability to cough, lung capacity, and gas exchange.

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Life Span Development (40 of 41)

- Late Adulthood
  - Physiologic Changes
    - Diminished smell, taste, hearing, vision.
    - Diminished pain perception and kinesthetic sense.
    - Prone to falls.
    - Problems with hydration and nutrition.
    - Changes in ability to communicate.
    - Health status varies widely.

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Life Span Development (41 of 41)

- Late Adulthood
  - Psychosocial Changes
    - May be satisfied with the outcome of life, or regrets can lead to depression.
    - Feelings of isolation may occur.
    - Financial difficulties may occur.
    - Decreased independence can affect feelings of well-being.

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Summary

- People develop and change throughout their life span.
- Changes are both physical and psychosocial.
- It is important to understand the assessment and management modifications needed for each stage of life.

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