Chapter 9
Life Span Development

Learning Objectives
• Describe body system developmental milestones, characteristics, vital signs of infants, toddlers & preschoolers, school-age children, adolescents, early adults, middle adults, late adults
• Distinguish unique psychosocial characteristics of infants, toddlers & preschoolers, school-age children, adolescents, early adults, middle adults, late adults

Learning Objectives (Cont’d)
• Explain psychosocial development of children, adolescents that results from parenting styles, sibling & peer relationships, environmental factors
• Explain physiologic characteristics, emotional challenges faced when treating older adults
Infants

- Newly born
  - Few hours old
- Neonates
  - Until 1 month old
- Infant
  - 1-12 months old

Infants (Cont’d)

- Vital signs
  - HR: 160-180 bpm
    - 1st 30 minutes <160 bpm
    - At age 1, 120 bpm
  - RR: 40-60 breaths/min
    - Drop to 30-40 breaths/min few min after birth
    - 20-30/min at age 1

Infants (Cont’d)

- Blood pressure 70 mm Hg after birth
  - 90 mm Hg at age 1
- Temperature
  - Wide fluctuation
- Weight 3-3.5 kg (7-8 lb) at birth
  - Gain of 30 g/day 1st month, doubling by 4-6 mos, tripling at 9-12 months
Body & Organ Systems

- First year development, infant coordinating motor skills
- Repeated motor actions build physical strength, increase motor coordination

Body & Organ Systems (Cont’d)

- Cardiovascular system
  - Fetal circulatory structure
    - Ductus arteriosis
    - Ductus venosus
    - Foramen ovale

Body & Organ Systems (Cont’d)

- Respiratory system
  - Passages smaller, softer, more flexible, more susceptible to obstruction
  - Tongue large in relation to mouth
  - Supine position causes obstruction
Body & Organ Systems (Cont’d)

- Respiratory system
  - Nasal passages soft, narrow, distensible,
  - Obligate nose breathers

Body & Organ Systems (Cont’d)

- Respiratory system
  - Chest wall thin, rib cage soft, pliant
  - Impaired movement of diaphragm affects ventilation
  - Lungs
    - Contain fewer alveoli
    - More likely to be injured by barotrauma
    - Higher oxygen demands can lead to rapidly increasing respiratory rates

Body & Organ Systems (Cont’d)

- Renal system
  - Infant kidneys unable to concentrate urine,
    resulting in more urine output
Body & Organ Systems (Cont’d)

• Immune system
  ➢ Susceptible to severe infections, infections by unusual organisms
  ➢ Maternal antibodies provide some protection through 6 months

Body & Organ Systems (Cont’d)

• Nervous system
  ➢ Brain near adult size
  ➢ All neurons present, but immature
  ➢ Infant reflexes
    ➢ Present at birth

Body & Organ Systems (Cont’d)

• Nervous system
  ➢ Infant reflexes
    ➢ Startle response
    ➢ Moro response

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Body & Organ Systems (Cont’d)

- Nervous system
  - Infant reflexes
    - Palmar grasp
    - Babinski reflex
    - Stepping/walking reflex

Body & Organ Systems (Cont’d)

- Nervous system
  - Fontanelles
    - Posterior, anterior fontanelles
    - Bulging
    - Depressed

Body & Organ Systems (Cont’d)

- Nervous system
  - Sleep needs
    - Vary, usually 16-18 hours/day
    - 2-4 mos, 14-16 hours/day
Body & Organ Systems (Cont’d)

- Musculoskeletal system
  - Bones grow in length at epiphyseal plate
    + Influenced by growth hormones, thyroid hormones, genetic factors, general health & nutrition
  - Muscles continue growth
    + Strengthen with use
  - Teeth
    + Begins with front teeth at 5-7 mos

Body & Organ Systems (Cont’d)

- Psychosocial development
  - Infancy
    + Reciprocal socialization important
    + Create connections with caregiver
    + Crying as communication
      + Be aware of difference in crying patterns

Body & Organ Systems (Cont’d)

- Psychosocial development
  - Separation anxiety
    + Infant cries when separated from attached caregiver
      + Protest
      + Despair
      + Detachment
    + Can make separation easier with familiar material objects
Body & Organ Systems (Cont’d)

- Emergency care implications
  - Observe infant before making contact
  - Keep on caregiver’s lap during physical examination if possible
  - Handle gently, but firmly, supporting head & neck
  - Do NOT shake, juggle infant
  - Keep caregiver in sight if possible to decrease separation anxiety, involve in care

- Return infant to caregiver as soon as possible
- Perform least-invasive parts of exam first
- Keep warm
- Speak softly, smile, touch, rock, hold, cuddle
- Examine from toes to head
- Distract with items in field of vision
- Avoid physiologic distress

Toddlers & Preschoolers

- Vital signs
  - Heart rate
    - 80-120 beats/min for toddlers
    - 80-100 beats/min for preschoolers
  - Respiratory rate
    - 20-30 breaths/min
  - Systolic blood pressure determination
    - 70 + (2 x age in years)
    - 70-100 mm Hg for toddlers
    - 80-110 mm Hg for preschoolers
  - Temperature 96.8°F to 99.6°F normal for both
Toddlers & Preschoolers (Cont’d)

- Cardiovascular system
  - Grows in strength, function

Toddlers & Preschoolers (Cont’d)

- Respiratory system
  - Continues to develop
  - Passages larger, rigid, more alveoli developing
  - Chest less flexible, less reliance on diaphragmatic breathing
  - Ribs & sternum pliable, more resistant to fractures
  - Injury to chest transmitted to lung tissue

Toddlers & Preschoolers (Cont’d)

- Renal system
  - At age 2, kidneys well developed, able to concentrate urine
  - Gain control of bladder, bowel function
Toddlers & Preschoolers (Cont’d)

- Immune system
  - Passive immunity no longer protects
  - Minor respiratory, gastrointestinal infections
  - Vaccinations given

Toddlers & Preschoolers (Cont’d)

- Nervous system
  - Brain grows faster than other parts of body
  - At age 2, brain weighs 90% of adult brain
  - Great gains in motor skills
  - Preschoolers understand written symbols
  - Vision completes development

Toddlers & Preschoolers (Cont’d)

- Musculoskeletal system
  - Muscle mass, bone density increase
  - Trunk, legs, arms lengthen, lose baby fat
  - Walking by 14-25 mos, may start earlier
  - Primary teeth erupted by age 3
Toddlers & Preschoolers (Cont’d)

- Psychosocial development
  - Toddlers
    - Self-awareness, self-confidence, self-control
    - “No” age, “age of negativism”
  - Preschoolers
    - Assert independence
    - Playing, hero-worship
    - Eager for responsibility

Toddlers & Preschoolers (Cont’d)

- Psychosocial development
  - Toddlers develop growing self-awareness, self-control
  - Parenting styles influence development
    - Authoritarian
    - Authoritative
    - Permissive-indifferent
    - Passive-indulgent

Toddlers & Preschoolers (Cont’d)

- Sibling rivalry
  - Natural jealousy toward brother/sister
  - If dealt with in productive, nonaggressive manner can provide child with critical skills in development
Toddlers & Preschoolers (Cont’d)

- Peer relationships
  - 2-3 years, develop basic relationships with other children
    - Begin to share, take turns
  - Help develop problem-solving skills, interpersonal relationships, friendship bonds

- Divorce
  - Effects dependent on age, social/cognitive development, relationship with parents
  - Behavioral problems
    - Depression, withdrawal, fear of abandonment

- Television violence
  - Exposure to TV, video game violence may affect behavior
  - Cartoons have profound impact on children 3-5 years of age
Toddlers & Preschoolers (Cont’d)

- Emergency care implications
  - Toddler examination
    - Encourage child’s trust
    - Try not to separate child, caregiver
    - Address by name
    - Smile, speak calmly, quiet tone
    - Allow participation in care when possible
    - Respect modesty
    - Allow holding of transitional objects
    - Explain illness/injury not child’s fault
    - Reassure child if procedure will not hurt

- Toddler examination
  - Do not show needles, scissors unless necessary
  - Avoid procedures on dominant hand, arm
  - Avoid covering child’s face
  - Involve caregiver in treatment when possible
  - Persistent irritability, inability to console/arouse patient, physiologic distress
  - Foreign body airway obstruction risk

- Preschooler examination
  - Examine/treat in upright position
  - Explain procedures briefly
  - Speak quietly in clear, simple language
  - Allow child to hold transitional object
  - Tell child what happens next, encourage to help
  - Warn child of painful procedure before continuing
  - Offer child treatment choices if possible
Toddlers & Preschoolers (Cont’d)

- Emergency care implications
  - Preschooler examination
    - Respect child’s modesty
    - Keep child warm
    - Allow caregiver with child whenever possible
    - Relieve child’s fear of separation from caregiver
    - Foreign body airway obstruction risk

School-Age Children

- 6-12 years
  - Developmental milestones
    - Muscle development = weight gain
    - Improved coordination
    - Puberty begins
    - Body proportions become more like adults
    - Engage in more unsupervised activities
    - Develop moral, ethical values
    - Social skills refined

School-Age Children (Cont’d)

- Vital Signs
  - Heart rate – 70-110 beats/minute
  - Respiratory rate – 20-30/minute
  - Systolic blood pressure – 80-120 mmHg

- Nervous system
  - Brain function increases in frontal lobe
  - Gray matter peaks
School-Age Children (Cont’d)

- Reproductive system
  - Puberty begins
    - Girls: 8-13 years
    - Boys: 13-15 years
- Lymphatic system
  - Continues growth until puberty, slows significantly

School-Age Children (Cont’d)

- Psychosocial development
  - Relates with peers
  - Self-discipline
  - Stressful years, peer acceptance
  - Self-esteem
  - Varies greatly
    - Maturity, life experiences, predictable stressors
  - Moral development

School-Age Children (Cont’d)

- Psychosocial development
  - Kohlberg’s stages of moral development
    - Stage 1 - Punishment, obedience
    - Stage 2 - Instrumental exchange
    - Stage 3 - Interpersonal conformity
    - Stage 4 - Law and order
    - Stage 5 - Prior rights, social contract
    - Stage 6 - Universal ethical principles
School-Age Children (Cont’d)

- Emergency care implications
  - Enlist child’s cooperation
  - Introduce yourself to child, approach in friendly, sympathetic manner
  - Explain procedures before performing
  - Allow child to see, touch equipment
  - Explain what will happen next, encourage child’s help with care
  - Warn child of painful procedure before performing
  - Honesty important

School-Age Children (Cont’d)

- Emergency care implications
  - When speaking with caregiver, include child
  - Respect patient modesty
  - Reassure patient of body integrity
  - Address preoccupation about death when appropriate

Adolescence

- 13-18 years
- Growth spurt
  - Heart, kidneys, liver, spleen reach full size
  - Girls growth ends at 16 years; boys 18 years
- Girls: progesterone, estrogen
- Boys: testosterone
Adolescence (Cont’d)

- Vital signs
  - HR: 55-105 beats/min
  - RR: 12-20 breaths/min
  - Systolic BP: 100-120 mm Hg
  - Core temp: 98.6°F
  - Blood chemistry equal to adults

Adolescence (Cont’d)

- Psychosocial development
  - Chaos, confusion
  - Cognitive development
  - Adult body, child’s mind
Adolescence (Cont’d)

- Emergency care implications
  - Speak to as an adult
  - Obtain history from patient if possible
  - Respect independence
  - Allow caregiver involvement if patient wishes
  - Explain clearly, honestly; allow for questions
  - Involve patient in treatment when possible
  - Respect patient’s modesty
  - Address patient concerns, body integrity, disfigurement

Adolescence (Cont’d)

- Emergency care implications
  - Deal with patient tactfully, fairly
  - Provide discharge instructions to patient
  - Vital signs approach adult values
  - Consider possibility of substance abuse, endangerment to self/others

Early Adulthood

- Physical changes
  - 20-40 years
  - Peak conditioning
  - Pregnancies
  - Aging begins
  - HR: 70 beats/min
  - RR: 16-20 breaths/min
  - Systolic BP: 120/80 mm Hg
  - Core temp: 98.6°F
Early Adulthood (Cont’d)

- Psychosocial development
  - Less defined
  - Intimacy
  - Clearer self-awareness

Middle Adulthood

- Physical changes
  - 41-60 years
  - High level of functioning
  - Gradual degradation

Middle Adulthood (Cont’d)

- Psychosocial development
  - Less stressful than early adulthood
  - Experience, professional/financial status
  - Mortality
  - Physical decline
  - May assume care of parents
  - Midlife crisis
Late Adulthood

- Physical changes
  - >60 years
  - Multiple body system issues possible
  - Terminal drop
    - Drastic decline in mental, physical functioning prior to death

Late Adulthood (Cont’d)

- Physical changes
  - Cardiovascular system
    - Decreased blood flow
    - Baroreceptor changes
    - Heart muscle stiffening, decreases ventricular filling
    - Decreased cardiac output

Late Adulthood (Cont’d)

- Physical changes
  - Respiratory system
    - Inspiratory, expiratory muscles become weaker
    - Decreased upper airway muscle tone
    - Oxygen-carrying capacity of blood decreased
  - Endocrine system
    - Pituitary gland decrease in volume
    - Delayed insufficient insulin release
    - Testosterone declines
    - Decreased estrogen, progesterone
Late Adulthood (Cont’d)

- Physical changes
  - Gastrointestinal system
    - Decreased cues of hunger, thirst causes dehydration
    - Salivary secretion decreases
    - Constipation, bowel elimination difficulty
  - Renal system
    - Kidney weight decreases; loss of renal cortex
    - Bladder capacity decreases
    - Weakening of bladder muscles results in urinary urgency
    - Prostate enlargement can cause decreased urine flow

- Psychosocial development
  - May begin to detach from social network
  - Cultural view of aging
  - Biological uselessness
  - Depression, despair
  - Death
Chapter Summary

- Newborn: first few hours of life; neonate: <28 days old
- Typical newborn weighs 3 to 3.5 kg at birth, triple by end of 1st year
- Infant born with several circulatory structures necessary for fetus

Chapter Summary (Cont’d)

- Nervous system functions in infant, primarily reflex actions
- Toddlers: 1-3 yrs; preschoolers: 3-5 yrs
- Toddlers, preschoolers grow rapidly, undergo increase in muscle, bone mass

Chapter Summary (Cont’d)

- Walking generally occurs by 14-15 mos
- Parenting styles have significant impact on development of children, adolescents
- School-age children: 6-12 yrs
Chapter Summary (Cont’d)

- Adolescents: 13-19 yrs
  - Nearly completed growth
  - Form changed to adult
  - Reach sexual maturity
- Early adulthood: 20-40 yrs
  - Body systems at peak performance
  - Love relationships occur
  - Parenting

Chapter Summary (Cont’d)

- Middle adulthood: 41-60 yrs
  - Menopause
  - Systems begin signs of aging
- Late adulthood: >60 yrs
  - Body system deterioration on basis of genetics, health, lifestyle

Questions?