



Certified Pediatric Nurse Review Course: Growth & Development

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NEMOURS
CHILDREN'S HEALTH

Overview

Understanding growth and development is essential to pediatric nursing. As children progress through various developmental stages, they achieve important milestones. Providing effective, developmentally appropriate care depends on recognizing that characteristics and needs unique to each stage.

- All interventions are based on the following principles:
 - **Family-centered, treating the child and family as a unit**
 - **Goal is to attain, maintain, or regain optimal health**
 - **Nursing interventions are guided by both the child's chronological age and level of development (physical and mental)**
 - **Health and development are affected by environment and heredity**

Objectives

- Discuss the stages of physical, cognitive and emotional development in children
- Identify milestones of growth and development for different pediatric age groups
- Recognize pediatric safety and nutrition needs
- Identify age-appropriate responses to acute and chronic illness
- Appropriately assess, diagnose, plan, implement and evaluate to ensure optimal care
- Summarize interventions to support healthy growth and development in children



Concepts of Growth & Development

Introduction

- Growth and development are not the same
- Growth implies an increase in size but does not necessarily include development
- Development describes the maturation of structures and includes growth
- Parents need to be taught normal childhood growth and development parameters



Introduction

- Growth and development progress in three ways:
 - Head to toe (Cephalocaudally)
 - Trunk to tips of extremities (Proximodistally)
 - General to the specific (ex. crawling to walking to skipping)



Four Developmental Periods



INFANCY

(birth to 12-15 months)

A period of rapid growth in which the head grows faster than other tissues



TODDLER-PRESCHOOL AGED

(12-15 months to

5 years)

A period of slow growth in which the trunk grows more quickly



SCHOOL AGED

(6 to 12 years)

A period of slow growth in which the limbs grow fastest



ADOLESCENCE

(13 to 18-20 years)

A period of rapid growth for the trunk, including the gonads and associated tissues

Erikson Psychosocial Development

Infancy (0 to 12-15 months)
Trust versus Mistrust

- Trust is essential for development of a healthy personality, fostered by consistency

Toddlerhood (1 to 3 years)
Autonomy vs Shame and Doubt

- Fostered through freedom and encouragement to become independent; Shame and doubt are promoted through overdependency

Early childhood (3 to 5 year)
Initiative versus Guilt

- Conscience develops

Middle childhood (6 to 12 years)
Industry versus Inferiority

- Focus on achievement

Adolescence (13 to 20 years)
Identity versus role confusion

- Become concerned with others' opinions as compared with their own self-concept

Piaget Cognitive Theory

Birth to 2 years
Sensorimotor

- Progress from reflexive to repetitive to imitative

2 to 7 years **Preoperational**
(**Preconceptual 2-4yrs & Intuitive 4-7yrs**)

- Egocentrism is the primary element of cognitive development. Thinking is magical, concrete, and dominated by perception

7 to 11 years
Concrete Operations

- Thought becomes more logical. Thinking is in terms of the world as concrete and tangible. The child can consider others' points of view.

11 to 15 years
Formal Operations

- Adaptability and flexibility are developed. Abstract thought. New ideas can be created



Family-centered Care

Overview

Family-centered care - treating the family as a unit

- Partnership
- Information sharing
- Participation
- Collaboration

Nursing considerations

- Sibling involvement
- Child's condition affect the entire family
- Parents should have 24-hour access to the hospitalized patient

Cultural Considerations

- It is essential for the pediatric nurse to assess the cultural components that are important to a family before making judgments or developing a plan of care.
- Asian healing practice examples:
 - Coining- rubbing the edge of a coin over chest and back to treat minor conditions, such as colds, cough, fever, and vomiting. Appears like streaks of bruising
 - Cupping- cups are placed on the skin with suction to treat respiratory problems. Appears in large circular bruising
- Jehovah's Witnesses are opposed to receiving blood products



Assessment and Measurement of Growth and Development

Growth Principles

- Weight
 - Average newborn 7lbs; at 5 months birth weight is doubled; at 1 year of age triple birth weight
 - Children < 2 years should be weighed naked on an infant scale; Children >2 years of age should be weighed wearing a gown or light clothing on a standing scale
- Length
 - Average newborn 20in; grows additional 10in during first year; birth length doubles at 4 years of age
 - Length board used up to 36 months old
- Height
 - Stadiometer- used for a child that is able to stand and follow directions
 - Should not be under 24 months
- Head circumference
- BMI

Growth Charts

- Measurements are recorded as percentiles for height for age, weight for age, head circumference for age and BMI
- If measurements cross multiple percentiles over a short period, or measurement is at or **below the fifth percentile**, or a **BMI is greater than 85%**, further evaluation is needed



Vital Signs

Temperature

- Oral thermometers not used until after age 4 to 5 years
- Temperature below 38°C (100.4°F) is not considered a fever

Respirations

- Rate decreases with age
- Infants are diaphragmatic breathers, and obligate nose breathers; count for full minute

Pulse

- Rate decreases with age
- Count for full minute

Blood pressure

- Choose appropriate cuff size

Pain Assessment

Overview

- Pain is a symptom that occurs when the child says it does

Assessment

- Determine intensity, type, location, duration
- Is pain distractable?
- Assess for crying, facial grimaces, appetite, insomnia, anger, behavioral changes

Pain Assessment Scales



0
NO HURT



2
HURTS
LITTLE BIT



4
HURTS
LITTLE MORE



6
HURTS
EVEN MORE



8
HURTS
WHOLE LOT



10
HURTS
WORST

Use pediatric pain assessment scale based on age and cognitive development

- FLACC Pain Assessment Scale
 - For infants, toddlers and young preschoolers
 - Preverbal and nonverbal children
 - Assesses: Face, Legs, Activity, Cry, and Consolability
- FACES Scale
 - For ages 4 to 8 years old
 - Uses pictures of six faces
 - Child selects face that best depicts their pain
- Visual Analog Scale and Numeric Scale

Interventions

- Reinforce pain is not a punishment for misbehavior
- Apply comfort measures
- Offer distraction
- Oral sucrose for young infants
- Allow child to do to a doll or stuffed animal
- Morphine is the standard for severe pain
 - Do not use codeine for children under the age of 12 years old undergoing tonsillectomy/adenoidectomy related to risk of respiratory suppression possibly leading to sudden death

Principles of Age

Chronologic age

- Years or months since birth

Mental age

- Level of cognitive function
- When the mental age and chronologic age differ, provide toys, teach safety, and communicate on the basis of mental age

Bone age

- The tarsals and carpals are X-rayed to determine the degree of ossification

Adjusted / corrected age

- Chronologic age minus number of weeks born prematurely

Nursing Interventions for Growth and Development Overview

- Developmental history
- Developmental screening
- Growth measurement
- Parent teaching of milestones
 - Anticipatory guidance to promote physiologic, cognitive and psychosocial development and safety

Developmental Milestones and Approaches to Care:
Infant (0-12 months)

0 to 3 months

- Overview
 - Neonatal period is the first 28 days of life and has the highest mortality rate of any period in childhood
 - Posterior fontanel closes around 2 months
 - Newborn has poor ability to regulate temperature control due to poorly developed sweating and shivering mechanisms
 - Limit exposure to cold during bathing
 - Cover the head
 - Hearing and touch are well developed at birth
 - Vision is poor; black and white are see best
 - Binocular vision develops by 3 months and can follow objects 180°

4 to 6 months

- Overview
 - **Birth weight doubles at 5 months**
 - Infant
 - Becomes more social
 - Sleeps through the night
 - Begins teething
 - Develops color vision and improved distance vision

Psychosocial Development

Trust-promoting experiences essential during infancy

- Establishment of primary caregiver
- Meeting basic needs

An infant cannot be spoiled

0 to 3 months:
Social smile is the infant's first social response

4 to 6 months:
Infant discerns one face from another and exhibits stranger anxiety

7 to 9 months:
Infant enjoys simple games; looking in the mirror

10 to 12 months:
May exhibit stranger anxiety; test caregiver's reaction

Cognitive Development

0 to 3 months: notice own hands



4 to 6 months: smiles and laughs



7 to 9 months: develops object permanence



10 to 12 months: simple gestures

Language / Communication

0 to 3 months

- Turns head toward sound
- Cry indicates need

4 to 6 months:

- Responds to own name

7 to 9 months:

- Understand the word "no", and the word should be limited

10 to 12 months

- Say about 5 words and understand many more

Motor Skills

0 to 3 months

- Reflex
 - Rooting- stroke cheek and face towards stroked cheek and begins to suck
 - Moro- startle reflex- with loud noise or sudden movement, limbs extend, fingers spread
 - Tonic neck/fencing- when supine with head turned to one side, arm and leg on that side will flex and arm and leg on opposite side of body will extend
 - Babinski- stroke outer sole of foot from heel to ball of foot and toes will hyperextend
 - Parachute- emerges at 5-6 months and is retained- arms extend (as if to break one's fall) when rotated quickly to airplane position
- No pillow in crib

Motor Skills

4 to 6 months

- Rolls from stomach to back, then from back to front
- Transfers objects from one hand to the other
- Infant sits with support

7 to 9 months

- Sits without assistance
- Crawls
- Develops a pincher grasp and places everything in the mouth

10 to 12
months

- Walks with support
- Claps hands and waves bye-bye

A photograph of four young children sitting on a grassy field. The child in the center is a young boy with curly hair, wearing a white t-shirt, smiling and clapping his hands. To his left is a girl with curly hair wearing a striped shirt, also smiling and clapping. To his right is a girl with long dark hair in pigtails, looking towards the center. On the far right is another girl, partially visible, smiling. The background shows green trees and a clear sky. A semi-transparent dark blue banner is overlaid at the bottom of the image, containing the title text.

Developmental Approaches to Care of Infants

Developmental Approaches to Care of Infants

- Care
 - Avoid separating the infant from the parent during care
 - Utilize quiet time to perform assessment
- Play
 - Distract the infant with games
- Teaching
 - Use adult learning strategies
- Observe for maladaptive responses to illness and hospitalization
- Provide developmentally supportive nursing interventions



Anticipatory Guidance and Injury Prevention

0 to 3 months



- Crib safety
 - No blankets or stuffed animals
- Safe infant sleep environment
 - On their backs
- Car seat
 - Rear facing
- Falls
- Inflicted injury
- Bath safety

Diet and Nutrition

- 0 to 3 months
 - Breast milk or iron-fortified formula is the only nutritional requirement
 - Immunoglobulins in breast milk are destroyed if heated in the microwave
 - Sufficient breast milk intake is monitored via appropriate weight gain and number of wet diapers
 - Feeding occur on demand, approximately every 3 hours
- 3 to 6 months
 - Introduce a cup at 6 months
- 7 to 9 months
 - Pincer grasp



Nutrition Guidelines

Give no more than 32 ounces of formula each day

First 2 years of life do not give reduced fat milk

Give Iron starting at 4 months

Do not prop a baby bottle

- Increases the risk of aspiration and otitis media

Introduce one new food at a time

- Wait 4-7 days in between

A photograph of four young children sitting on a grassy lawn outdoors. The children are of diverse backgrounds and are all smiling and clapping their hands. The background shows green trees and a clear sky. A semi-transparent dark blue banner is overlaid at the bottom of the image, containing the title text.

Developmental Milestones and Approaches to Care: Toddler (ages 1 to 3)

Toddler (ages 1 to 3)

- Period of slow growth
- Anterior fontanel closes by 18 months
- Separation anxiety
- Magical Thinking
- Language/Communication
 - By 12 months uses 5 words
 - By 18 months uses 50 words
 - By age 2, uses 400 words in two- to three- word phrases
 - By age 3 is a chatterbox

Toddler

- Motor skills
 - Provide push/pull toys to encourage walking
 - Climb stairs at age 21 months
 - Ride tricycle by age 3 years
- Developmental approaches to care
 - Avoid separation
 - Regression may occur
 - Provide choices
 - Toilet Training
 - Discipline

Developmental Milestones and Approaches to Care:
Preschool (Ages 3 to 5)

Preschool Age

- Slow growth continues
- Imaginative play: pretend, dress-up, imaginary friends
- Preschoolers are concrete thinkers
- At age 3 years child can build a tower
- Use a doll to help prepare
- Should have 20 deciduous teeth
- Nighttime dryness is generally achieved by age 5





Developmental Milestones and Approaches to Care: School-age Child (Ages 6 to 12)

School-age (Ages 6 to 12)



Psychosocial Development

Erikson's stage of industry versus inferiority; school is seen as the "job"

Teachers can be a major influence

Cooperative play

Sense of morality; child conforms to social norms



Cognitive Development

Piaget's cognitive level of concrete operations

Develops sense of time and space, causes and effect, and numbers

School participation and achievement are essential

Developmental Milestones and Approaches to Care:
Adolescent (Ages 13 to 18)

Adolescents



Rapid growth and puberty-related changes



Psychosocial development

Erikson's stage of identity versus role confusion
Struggles to confront morality, sexuality, and future occupation



Cognitive development

Develops abstract thinking
Piaget's level of an adult, however, brain maturity continues

Puberty

- Development of secondary sex characteristics often occurs during school-age years
- Female
 - Breast development (thelarche), the first sign of puberty (Tanner assessment), begins on average at age 9.7 with the bud stage (range = 7-13 years)
 - Breast development takes approximately 3 years to complete
 - Breast development ends by approximately age 17
 - Onset of menses occurs between ages 8 and 16 (average 12.5)
- Male
 - Testicular enlargement first sign of puberty approximately at 11 years
 - Height spurt begins 2 years later than female's

Adolescents

- High-risk Behaviors
 - Motor vehicle accidents are the primary cause of mortality and morbidity
 - Car safety is essential (i.e. texting)
 - Suicide is the third leading cause of death (homicide is second)
 - Assess for access to firearms
 - Approximately half of all adolescents have had sexual intercourse by high-school graduation
 - Half of sexually transmitted infections occur in youth age 15-24
 - Use the HEEADSSS assessment



Nursing Considerations for Adolescents

- Remain nonjudgmental
- Do not promise to keep information confidential if it involves potential danger to the youth
- Questions related to reproductive choices (pregnancy, birth control, treatment of STIs) may be confidential
- Promote peer interaction
- Provide emotional support
- Respect and maintain privacy

Knowledge Check

The mother of a 9-month-old infant asks at what age can she offer her baby cow's milk. The pediatric nurse tells the mother that cow's milk is introduced once an infant reaches what age?

- A. 9 months old
- B. 12 months old
- C. 15 months old
- D. 18 months old

Knowledge Check

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- B. 12 months old**
- C. 15 months old
- D. 18 months old

Rationale: Cow's milk is introduced at 12 months old. Breast milk or iron-fortified formula is recommended for neonates to 12 months old.

Knowledge Check

A parent is concerned because her 16-year-old daughter is not as interested in family activities and is more interested in activities with friends. What statement by the nurse is most appropriate?

- A. You should require your daughter to attend all family activities
- B. Continue to involve your teenager in family activities, and you can offer to allow a friend to come when it's appropriate
- C. Your daughter may have mental health issues and should see a psychologist
- D. Stop inviting your daughter to family outings while she is a teenager

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Rationale: Adolescents may be more interested in friends and peer social events than in family activities. It is important for parents to continue to include the adolescent in the activities. Allowing the teen to invite a friend to certain events may be a useful strategy.

Knowledge Check

A 12-month-old child is brought to the pediatric clinic for a well-child visit. Which developmental milestone would the nurse expect the child to have achieved?

- A. Says two-word phrases like "want toy"
- B. Builds a tower of two blocks
- C. Copies a circle with a crayon
- D. Walks with one hand held

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Rationale: By 12 months of age, most infants are beginning to walk, often with assistance, such as holding onto furniture or a caregiver's hand. Two-word phrases is more typical around 18-24 months. Two-block tower is generally developed closer to 15-18 months. Drawing a circle with a crayon is a fine motor skill that is typically achieved around 3 years of age

Knowledge Check

During a well-child visit, the nurse assesses a 4-year-old child. Which behavior is developmentally appropriate for this age group?

- A. Separates easily from parents at drop-off
- B. Puts on shoes and ties shoelaces
- C. Plays cooperatively with other children
- D. Copies a triangle

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Rationale: By age 4, children typically engage in cooperative play, sharing and interacting with peers during group activities. Some 4 years olds may be able to separate easily from parents, but this is more seen by the age of 5. Shoe tying develops around 5-6 years of age.

Knowledge Check

A 15-year-old adolescent is hospitalized for a chronic illness and expresses frustration about missing time with friends and feeling "different". Which nursing intervention is most appropriate to support the adolescent's psychosocial development?

- A. Provide opportunities for the adolescent to interact with peers through hospital social groups or virtual platforms
- B. Encourage the adolescent to play board games with younger patients to stay occupied
- C. Explain the illness using concrete language and visual aids
- D. Involve the parents in all conversations and decisions about care to maintain structure

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Rationale: Adolescents have a strong need for peer connection and identity development. Supporting peer interaction, even in the hospital setting, helps maintain social development and reduces feelings of isolation

References

- Fitzgerald, M., & Jack, D. (2023). *Pediatric Nurse Certification Review*. Springer Publishing Exam Prep.
- Jakubik, L., & Selekman, J. (2023). *Pediatric Nursing Certification Review* (5th ed.). Society of Pediatric Nurses.