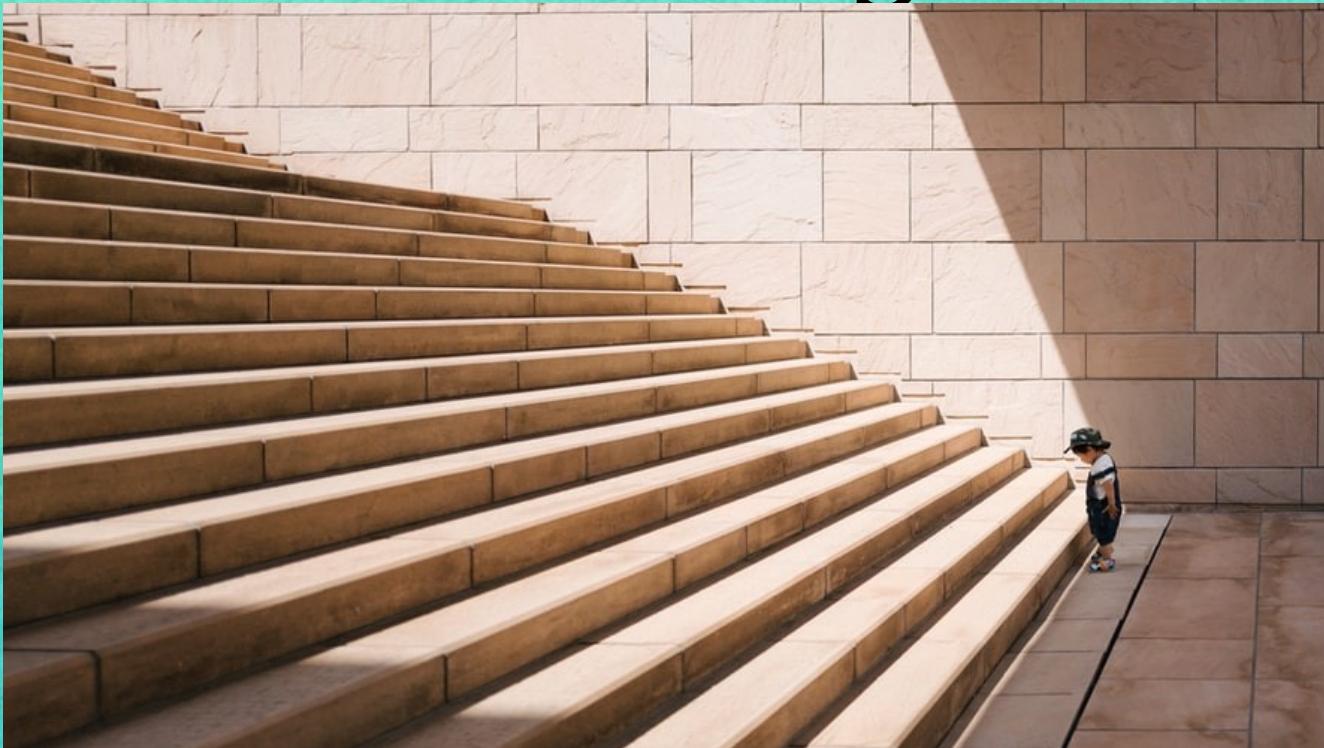


Infants, Children, and Adolescents in Health & Illness

Week #1 August 24, 2021
Laurine Gajkowski, ND, RN, CPN

Welcome to Pediatric Nursing!



Part 1

Walk-Through
of
Fall Semester

NURS 316



WS Question #1

Why?

1. Why are you taking this course?



Laurine's 3 Big Ideas



- Students will provide support, education, and guidance to children and families from diverse communities and backgrounds to **promote optimal development and prevent illness.**
- Students will provide safe, knowledgeable, meticulous care to children and their families during vulnerable periods to **regain health.**
- Students will demonstrate professional growth through their experience with children which inspires them to influence public policy and seek continuous learning to **sustain optimal health.**

Week	Class Date	28hours Class	text chapter	21hours Lab activities	98 hours Clinical focus	Outcome Evaluation
1	8/24/21	Intro to the course Pediatric Nursing	1,2	Frontloading simulations in HEC Intro to Pediatric math	Orientation to Hospital & Unit, pediatric V.S. norms	All oriented to their clinical site
2	8/31	Nutrition F/E Balance	14, 18	Math safety stations, Med math test	Pediatric medication guidelines, math calculations for Essentials Card	Math test Kaplan Peds A due
3	9/7	Pediatric Assessment Respiratory	5,20	RSV simulation	No Monday clinical	Canvas Quiz#1 due Friday 9/10
4	9/14	Growth & Development Health Promotion	4,6,7, 8,9		Primary Care	
5	9/21					Kaplan B Focused Review remediation
6	9/28					Midterm clinical evaluation
7	10/5	Midterm Exam				Midterm Exam
8	10/12 10/19 is fall break					
9	10/26					NCP due according to instructor
10	11/2					Canvas Quiz #2
11	11/9					
12	11/16					Kaplan Peds C
13	11/23				Thanksgiving is 11/25	Final clinical evaluation
14	11/30	Kaplan Secured Test				Kaplan Integrated Exam Kaplan remediation
	12/15	Final Exam		08:00-11:00		Comprehensive Final Exam

Learning Activity	%Weight	Description
Medication math safety	6	Pediatric math skills will be assessed.
Lab proficiency	4	Pediatric skills will be assessed in lab.
Nursing Care Plan (NCP)	14	2 NCP will be completed based on care provided during outpatient & inpatient clinical.
Participation Points (PP)	4	A minimum of 2 contributions to class discussions and documented by student in Canvas.
Health Alteration Presentation (HAP)	7	Students will work in groups to present a chosen pediatric case study during class .
Pre-class or In-class Worksheets (WS)	5	When a pre-class WS is assigned it is due prior to the start of class. When an in-class WS is assigned it is due at the end of class.
Canvas Quizzes (CQ)	10	3 timed, open-book quizzes will be posted on Canvas after Tuesday class & will be due on that Friday evening.
Midterm exam	20	Knowledge of class and lab content up to 9/28 will be assessed.
Comprehensive final exam	30	Knowledge of class, lab, and clinical content over the full 14 weeks will be assessed.
Kaplan testing	P/NP	Peds Math, Focused Review (3) and Integrated (1) tests with remediation will be completed.
Clinical papers	P/NP	Daily Essentials Card, clinical reflection papers, or others as assigned will be submitted to the student's clinical instructor.
Clinical evaluation	P/NP	Clinical performance will be assessed at midterm and after completion of clinical hours.
Total	100	

WS Question #2

How many?

2. How many canvas quizzes are planned ?

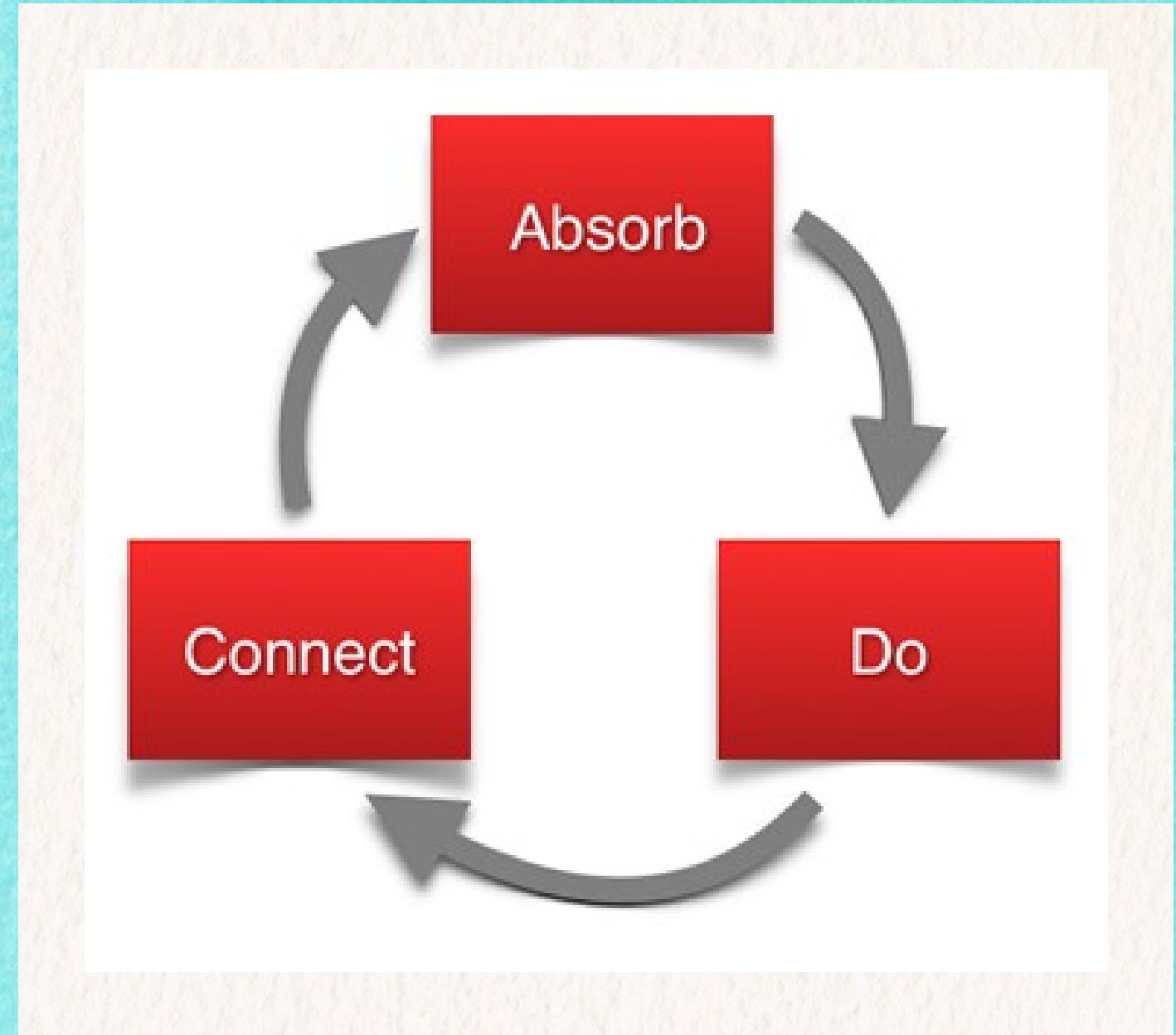


Part II

Guiding Images



Learning Model



Better Way to Reach your Learning Destination

Bus



Bike



The Bindler-Ball Healthcare Model:

A paradigm for health promotion



Reprinted by permission from Ball, J. & Bindler, R. (2006). *Child health nursing: Partnering with children & families*. Upper Saddle River, NJ: Prentice Hall Health, p. 5.

WS Question #3

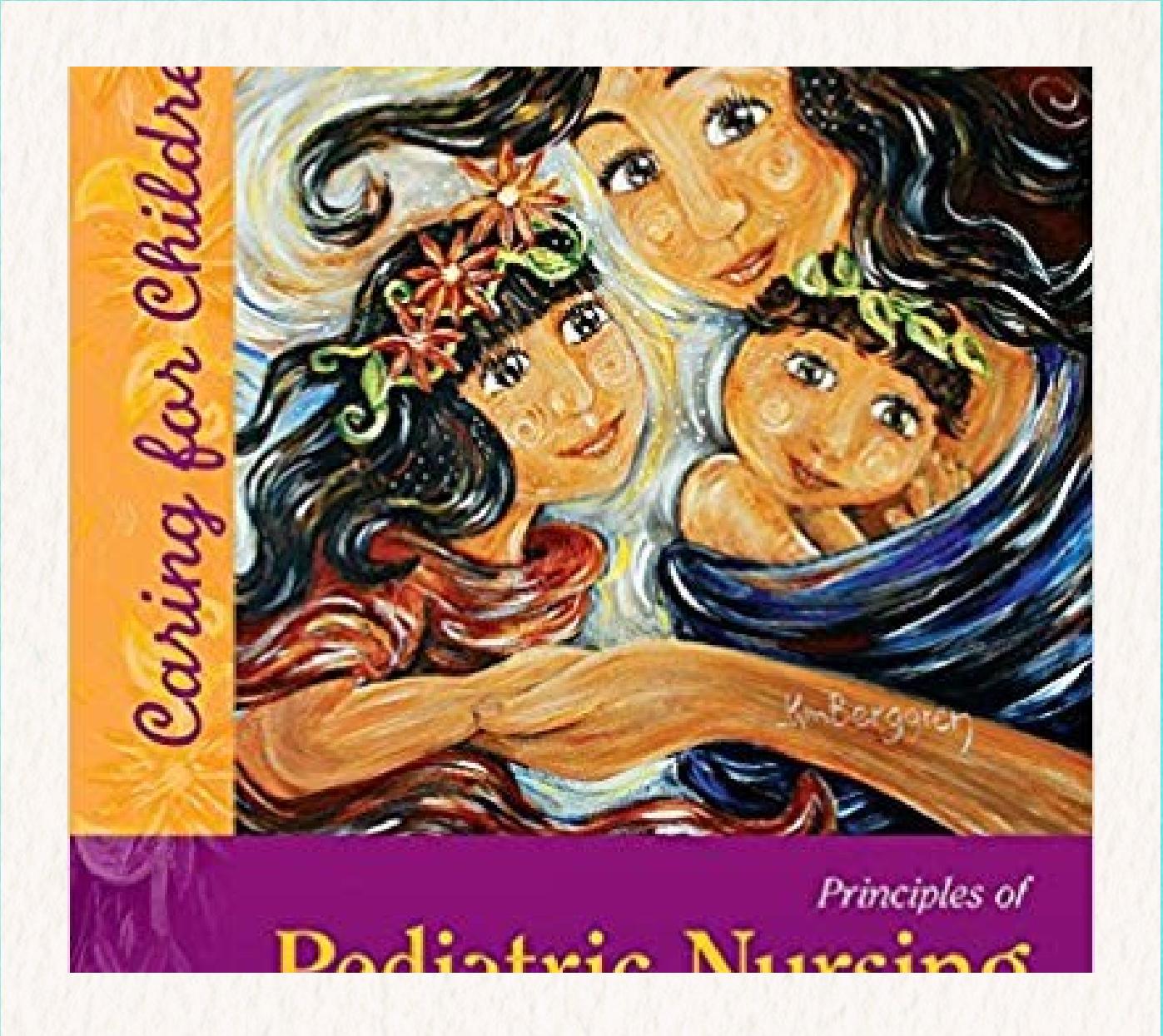
Bus or Bike?

3. Will you learn better by sitting on the bus or pedaling your own bike?



Part III

Chapters One and Two



Chapter 1

Nurse's Role in Care of the Child: Hospital, Community, and Home

Learning Outcomes

1. Compare roles of pediatric nurses
2. Analyze societal trends that influence child health care
3. Report child health statistics
4. Examine unique legal and ethical issues

Role of the RN in Pediatric Nursing

- Direct Inpatient Acute Care
- Primary Care (outpatient settings)
- Patient Education
- Patient Advocacy
- Case Management
- Research

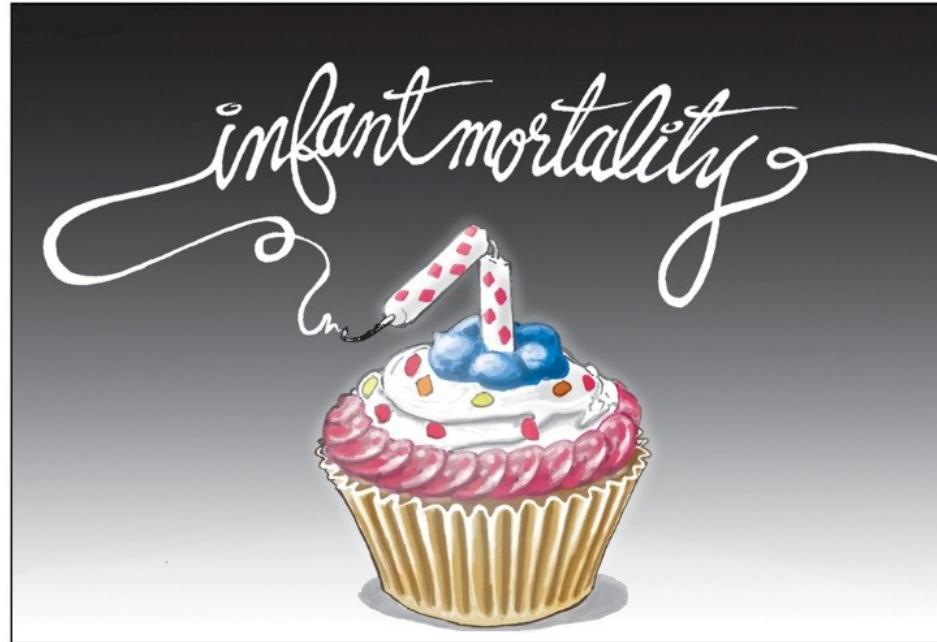
Societal Trends in Children's Healthcare

Restricted visitation
Prolonged hospitalization



Growing Racial & Ethnic Diversity
Family-Centered Care
Culturally Sensitive Care
Interprofessional Collaboration
Quality and Safety
Evidence Based Practice
Patient Experience
Expanded Use of Technology
Assessing the SDOH



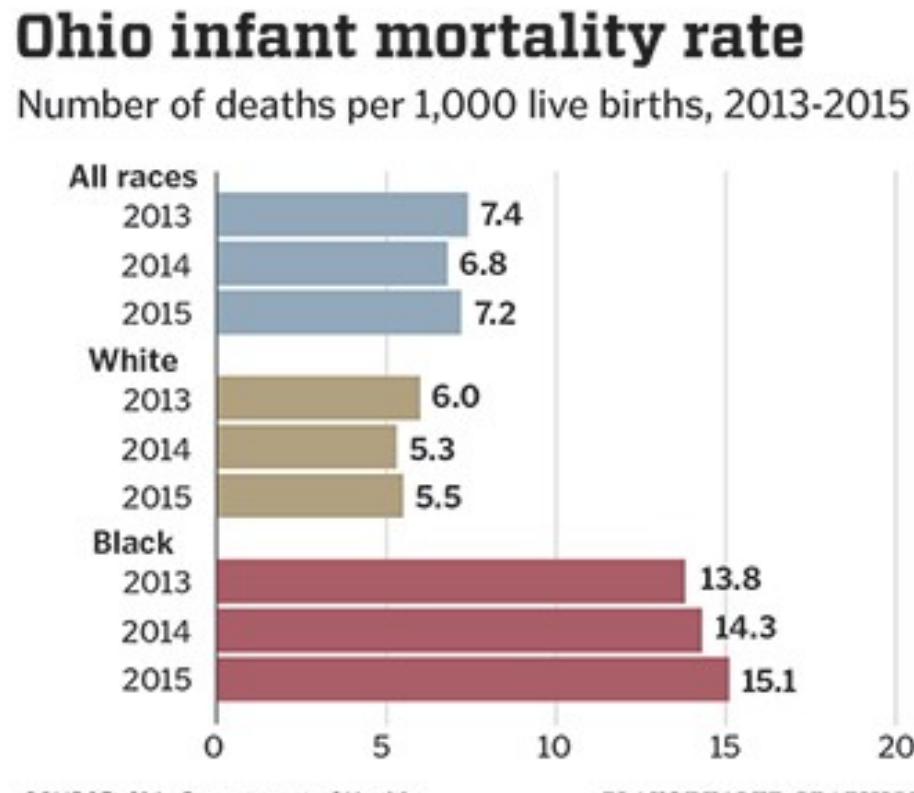


- **Death of a baby before his/her first birthday**
- The loss of a baby takes a serious toll on the health and well-being of the family, community, and nation.
- The IMR is an indicator of the overall health of a population.
- IMR = number of infant deaths per 1,000 live births

The HEALTHY PEOPLE 2030 Objective is to lower IMR to **5.0**

- USA IMR for 2019 recorded as **5.8**
- Ohio's rate (**7.3**) is worse than the nation's (**5.8**)
- Mississippi's IMR was the worst in the nation at **8.3**
- In the first quarter of 2019 the rate for Cuyahoga County rose to **10**
- Cleveland's Glenville neighborhood had rate of **15**

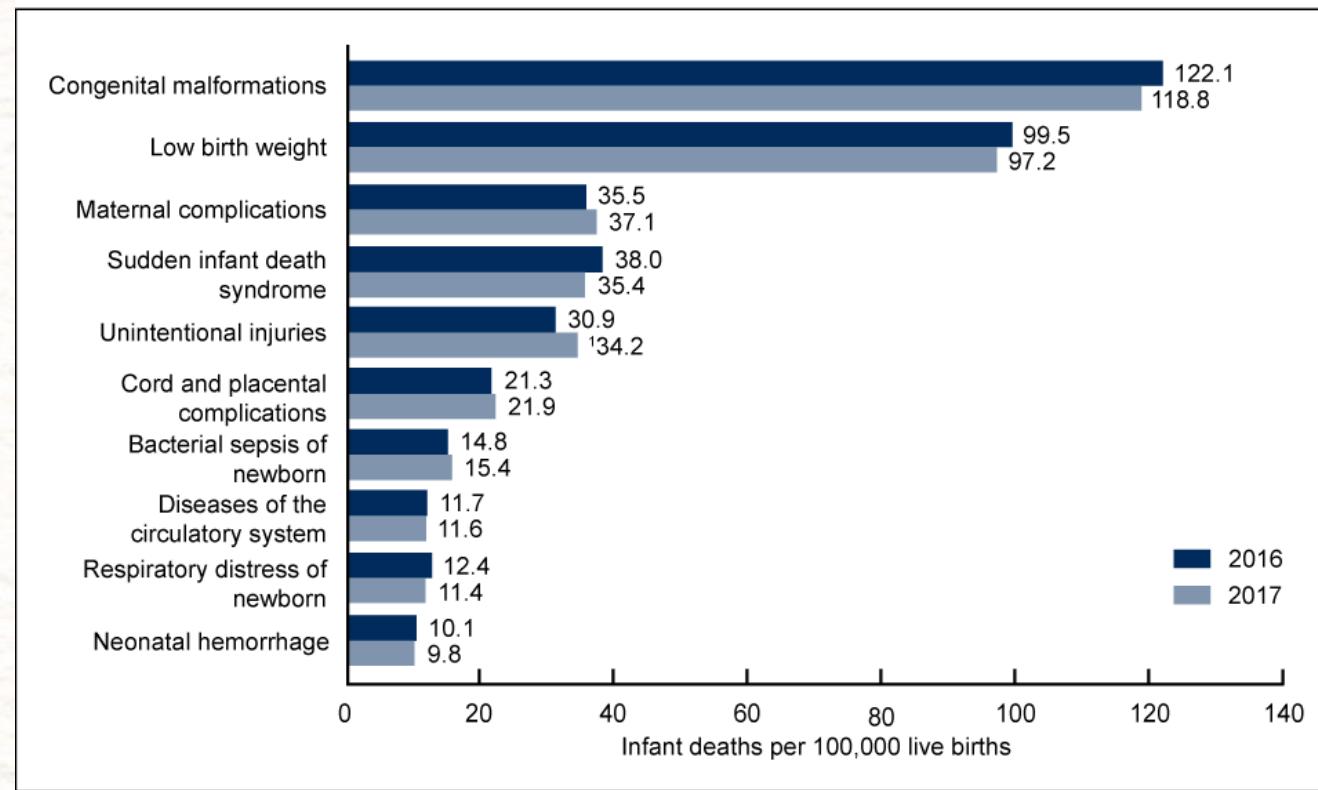
Health Disparity in IMR



- Ohio ranks 47th in the US for IMR among black infants
- Discuss FYC infographic
- In Cuyahoga County, black infants are almost three times more likely to die than white infants.
- <https://www.wksu.org/health-science/2019-12-26/cuyahoga-county-infant-mortality-rate-drops-but-racial-disparities-persist>
- <https://www.youtube.com/watch?v=csCuG9rme1Q&t=1s&authuser=0>

Leading Causes of Infant Death

Figure 5. Infant mortality rates for the 10 leading causes of infant death in 2017: United States, 2016 and 2017



¹Statistically significant increase in mortality rate from 2016 to 2017 ($p < 0.05$).

NOTES: A total of 22,335 deaths occurred in children under age 1 year in the United States in 2017, with an infant mortality rate of 579.3 infant deaths per 100,000 live births. The 10 leading causes of infant death in 2017 accounted for 67.8% of all infant deaths in the United States. A total of 23,161 infant deaths occurred in 2016, with an infant mortality rate of 587.0 infant deaths per 100,000 live births. Causes of death are ranked according to number of deaths. Rankings for 2016 data are not shown. Data table for Figure 5 includes the number of deaths under age 1 year for leading causes of infant death. Access data table for Figure 5 at: https://www.cdc.gov/nchs/data/databriefs/db328_table-508.pdf#5.

SOURCE: NCHS, National Vital Statistics System, Mortality.

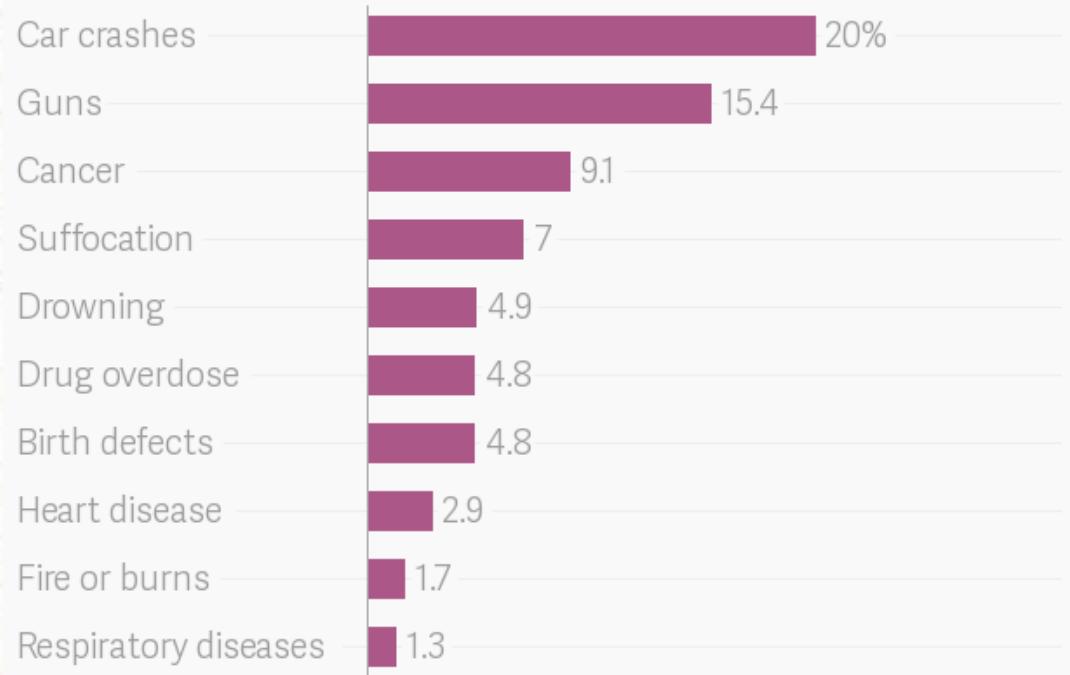
- 1. Birth Defects
- 2. Prematurity
- 3. Sleep Related Deaths

Child Mortality

- Number of deaths among **children ages 1 to 19 per 100,000 children**
- This rate decreased by half between 1980 and 2002.
- Last century the leading cause of child mortality was infectious disease.
- Now the major cause of death is **unintentional injury**.
 - Motor vehicle crashes, Guns, Suffocation, Drowning, burns, poisoning
 - Motor vehicle crash deaths are decreasing but drug overdose deaths and suicides have increased.

Top ten causes of death for US children age 1 to 19

Share of total childhood deaths, 2016



ATLAS

| Data: Cunningham et al, NEJM 2018, with data from the CDC

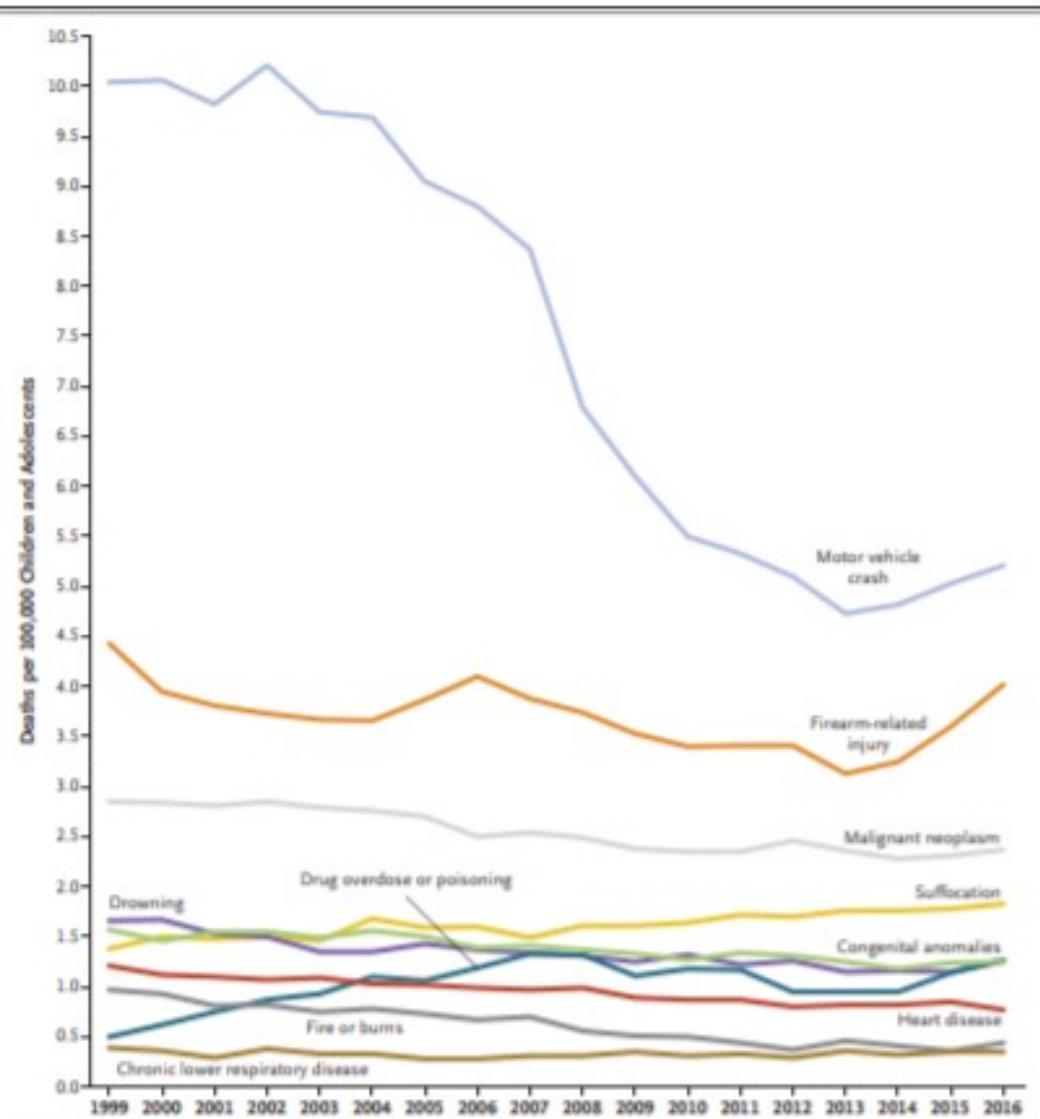


Figure 1. Mortality Rates (Deaths per 100,000 Children and Adolescents) for the 10 Leading Causes of Death in the United States from 1999 to 2016.

Data were obtained from the Wide-ranging Online Data for Epidemiologic Research (WONDER) system of the Centers for Disease Control and Prevention (CDC), known as CDC WONDER,² according to the codes of the International Classification of Diseases, 10th Revision (ICD-10),³ for the leading causes of death among children and adolescents. Age was restricted to children and adolescents 1 to 19 years of age.

Morbidity

- An illness or injury that limits activity, requires medical attention or hospitalization, or results in a chronic condition.
- Causes:
 - Mood disorders
 - Pneumonia
 - Asthma
 - Appendicitis
 - Epilepsy
 - Others

WS Question #4

IMR

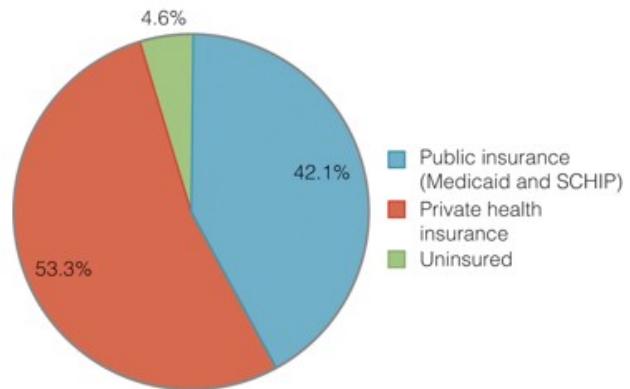
4. Which actions would reduce the IMR in Cleveland?

- A. Teach parents about safe sleep
- B. Address extreme prematurity
- C. Reduce structural racism
- D. All of the above



Pediatric Healthcare Issues

Finance



Technology



Source: Data from Martinez, M., & Cohen, R. A. (2015). **Health insurance coverage: Early release of estimates from the National Health Interview Survey, January–September 2014**. National Center for Health Statistics. Retrieved from <http://www.cdc.gov/nchs/data/nhis/earlyrelease/insur201503.pdf>

Legal & Ethical Issues



Informed Consent

- The duty of the health care provider to discuss the risk/benefits of a treatment or procedure with the individual prior to giving care.
- A provider that treats an individual without proper consent may be charged with assault.
- While children are entitled to informed **assent**, the child's legal guardian usually gives informed **consent**.
- Obtain legal advice for complex family issues related to guardianship, divorced parents disagreeing over care, or a caregiver who isn't legal guardian.
- Proxy consent can be granted in writing by the parent to another adult.

Consider the *Rule of Sevens*

Assent

- The child has been informed about what will happen during the treatment and is willing to permit the health care provider to perform the care.
- Assent from the child may improve the outcome of the treatment and minimize trauma to the child.

Consent considerations by age

- Age < 7 years: Unable to understand concrete explanations
- Age 8-14 years: Some understanding and reasoning
- Age >14 years : Can weigh options and make decisions. The **age of majority** is the age at which a person is considered to have all the legal rights and responsibilities of an adult.
- In most states in the USA a **minor** is a person under the age of 18.





Sometimes a minor can consent for care

- In many states a child under 18 can consent to certain care without parental notification. **Mature minors** can be adolescents between 14 and 18 years of age.
 - ❖ Drug and alcohol treatment
 - ❖ Care involving pregnancy, contraception, or treatment of sexually transmitted infection
- These laws encourage children to seek help when informing their parents might lead them to avoid care.
- **Emancipated minors:** Legal recognition that a minor lives independently and is legally responsible for his/her own decision making
 - In some states, minors are automatically emancipated by marrying, joining the military, or becoming a parent.

Accountability and Risk management

There is heightened duty in caring for children. They are more vulnerable because of their communication limitations and immature physiology.

- 1. Avoid medication errors
 - ✓ Use the child's weight to confirm proper dose
 - ✓ Use caution with numerous formulations of meds and routes
 - ✓ Give accurate IV solutions
- 2. Attend to child safety
 - ✓ Prevent misidentification
 - ✓ Keep side rails up on cribs and beds
 - ✓ Monitor IV site every one hour
 - ✓ Use sterile technique for parenteral medication administration

HIPAA Confidentiality Exceptions

1. Mandatory reporting of child abuse
2. Mandatory injury reporting when client is injured by a weapon or criminal act.
3. Local health department reporting of specific communicable diseases (HIV, TB, hepatitis, and STDs)
4. Duty to warn third parties if there is a specific threat to an identifiable person.

Pediatric Ethical Issues

- Withholding/Withdrawing Treatment
- Genetic Testing
- Organ Transplantation
- Futility: a situation where treatments don't provide a clear benefit.
- Physician is not obligated to offer interventions that cause extreme pain and suffering when there is no or limited potential benefit.

WS Question #5

Assent or Consent?

5. What should the nurse consider when having **consent** forms signed for surgery and procedures on a minor **child**?

- a. Stepfathers can give consent if the biological mother isn't available to sign.
- b. Only a parent or legal guardian can give consent.
- c. Emancipated minors can only give assent.



Chapter 2

Family-Centered Care and Cultural Considerations

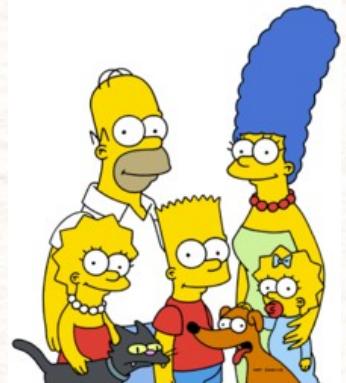
Learning Outcomes

1. Describe Family-Centered Care
2. Identify Different Types of Families
3. Contrast Parenting Styles
4. Explain the Effects of Major Family Changes on Children
5. Summarize the Advantages of Family Assessment Tool

What Is a Family?

- Self-Identified
 - Includes “honorary” members
 - Dynamic
- Share Resources
 - Emotional, physical, financial
 - Guided by common values
- None are “Typical”
- The family remains the basic social unit.
- Its definition varies but includes:

“When 2 or more persons are joined by bonds of sharing and emotional closeness and identify themselves as members of the family.” (Friedman, 2003)



Family-Centered Care

A philosophy recognizes child's family as:

- the constant in the child's life
- a partner in child's healthcare
- respected for its culture, experience, and skills

- Increases trust
- Improves outcomes
- Increases compliance with therapies
- Reduces anxiety for child and family

Family Composition

- Nuclear (considered “traditional”)
- Extended
- Extended kin network
- Single parent (strains)
- Blended/Reconstituted
- Binuclear (co-parenting)
- Gay & lesbian



Parenting

- A leadership role in the family
- Guides children to learn acceptable behaviors, beliefs, morals, and rituals
- Provides nurturing, safe, and structured



- Parent-child relationship is the strongest of all relationships
- Attachment is essential for human survival.
- Positive parenting practices result in secure attachments, self-esteem, and effective relationships with others.
- These practices include:
 - showing an unconditional positive regard,
 - responding to child's needs,
 - using active listening.

“Eat your peas”

Table 2-3 Parenting Styles by Level of Warmth and Control

Parenting Style	Warmth/Control	Behavior of Parent	Child Outcomes
<i>Authoritarian</i>	High control Low warmth	Highly controlling, issues commands and expects them to be obeyed Little communication with the child Inflexible rules Permits little independence	May become fearful, withdrawn, and unassertive Girls often passive and dependent during adolescence Boys often rebellious and aggressive
<i>Authoritative</i>	Moderately high control	Accepts and encourages growing autonomy of the child	Tends to be best-adjusted, self-reliant, self-controlled, and socially competent
	High warmth	Open communication with the child Flexible rules	Higher self-esteem Better school performance
<i>Permissive</i>	Low control High warmth	Few or no restraints Unconditional love Communication flows from child to parent Much freedom and little guidance	May become rebellious, aggressive, socially inept, self-indulgent, or impulsive May be creative, active, and outgoing
<i>Indifferent</i>	Low control Low warmth	No limit setting Lacks affection for the child Focused on stress in own life	May show a high expression of destructive impulses and delinquent behavior

Source: Adapted from Craig, G. J., & Dunn, W. L. (2013). *Understanding human development* (3rd ed., p. 206). Upper Saddle River, NJ: Pearson.

Discipline



- Reasoning
- Behavior modification
- Experiencing consequences
- Corporal punishment
- Scolding or yelling

Special Family Considerations

- Divorce
 - Disruption linked to academic and behavior problems
 - Fear of abandonment
- Step parenting
 - Blended families negotiate new traditions & routines
 - Legal issues when obtaining consent
- Foster Care
- Adoption
 - Birth parents relinquish legal rights prior to adoption
 - Child's response varies through the years

Table 2-4

Potential Effects of Divorce on Children of Different Ages

Age (Years)	Behavior*	Age (Years)	Behavior*
3–5	Fear, anxiety, worry Sorrow and grief Anger Regression Searching and questioning Temper tantrums Increased crankiness and aggression Self-blame Loneliness, unhappiness, depression	11–13	Panic Fear Depression Guilt Risk taking Fear of loneliness and abandonment Denial Anger
6–8	Worry, anxiety, depression Sadness Insecurity Fantasy Guilt Self-blame Inability to concentrate on schoolwork Regression Confusion Grief Anger and aggression Resentment Behavioral problems at school and home	14–17	Struggle with morality Loneliness Sadness Anger Fear Depression Guilt Aggressiveness Truancy, use of drugs and alcohol Sexual acting out
9–10	Anger Anxiety and depression Grief Manipulation of parents Withdrawal from friends and activities Resentment Behavioral problems at school and home Loneliness Fear		

*This table lists some of the behaviors that could potentially be seen with different age groups and is not all-inclusive. Many other behaviors could be present as well, depending on the individual child.

Source: Data from Wallerstein, J. S., & Blakeslee, S. (2004). *What about the kids? Raising your children before, during, and after divorce*. New York: Hyperion; Douglas, E. (2006). *The effects of divorce on children*. University of New Hampshire Cooperative Extension. Retrieved from <http://ceinfo.unh.edu>; Craig, G. J., and Dunn, W. L. (2013). *Understanding human development*. (3rd ed.). Upper Saddle River, NJ: Pearson; Portnoy, S. M. (2008). The psychology of divorce: A lawyer's primer, Part 2: The effects of divorce on children. *American Journal of Family Law*, 21(4), 126–134; Weston, F. (2009). Effects of divorce or parental separation on children. *British Journal of School Nursing*, 4(5), 237–243.

Family Theories

- Family Development
- Family Systems
 - Open or closed family
- Family Stress

Duvall's Family Development Theory

Table 2-5 Eight-Stage Family Life Cycle

Stages	Characteristics
<i>Stage I</i>	Beginning family, newly married couples*
<i>Stage II</i>	Childbearing family (oldest child is an infant through 30 months of age)
<i>Stage III</i>	Families with preschool children (oldest child is between 2.5 and 6 years of age)
<i>Stage IV</i>	Families with school-age children (oldest child is between 6 and 13 years of age)
<i>Stage V</i>	Families with teenagers (oldest child is between 13 and 20 years of age)
<i>Stage VI</i>	Families launching young adults (all children leave home)
<i>Stage VII</i>	Middle-aged parents (empty nest through retirement)
<i>Stage VIII</i>	Family in retirement and old age (retirement to death of both spouses)

*Keep in mind that this was the norm at the time the model was developed, but today families form through many different types of relationships.

Source: Adapted from Duvall, E. M. (1977). *Marriage and family development* (5th ed.). Philadelphia: Lippincott; Duvall, E. M., & Miller, B. C. (1985). *Marriage and family development* (6th ed.). New York: HarperCollins; Gedaly-Duff, V., Nielsen, A., Heims, M. L., & Pate, M. D. (2010). Family child health nursing. In J. R. Kaakinen, V. Gedaly-Duff, D. P. Coehlo, & S. M. H. Hanson, *Family health care nursing: Theory, practice and research* (4th ed., pp. 332–378). Philadelphia: F.A. Davis.

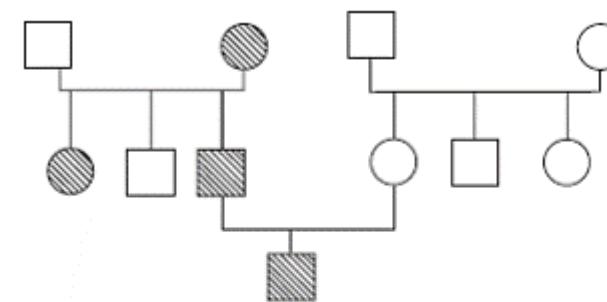
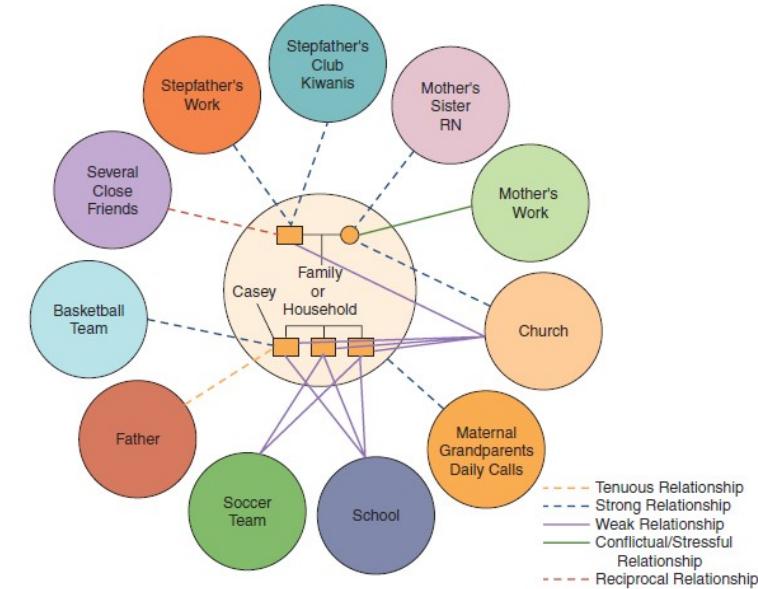
Family Assessment

- Family Stressors
- Family Strengths
 - Traits, such as Optimism or Resilience
 - Assets, such as Finances
 - Skills and Competencies, such as Problem Solving
 - Motivation
- Collecting and Illustrating Data

Family Assessment Tools

- Genogram
- Family Ecomap
- Home Observation for Measurement of the Environment (HOME)

Ecomap of Casey's Family



WS Question #6

Eat your peas!

6. List the characteristics of a child raised by parents using the “Authoritarian” parenting style.





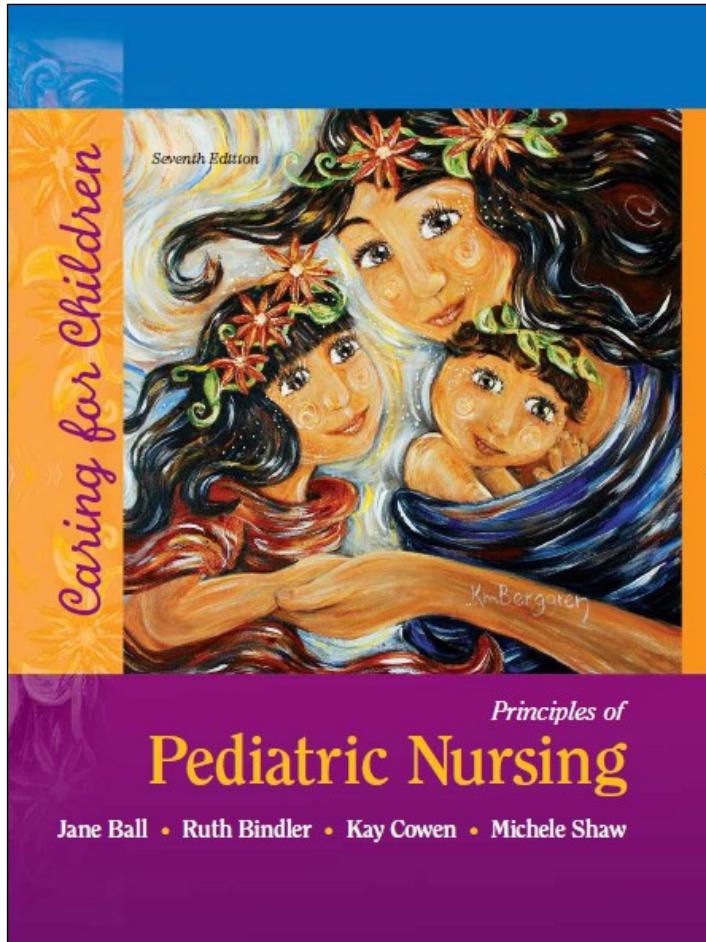
Welcome to Pediatric Nursing!



We can do this
together!

Principles of Pediatric Nursing: Caring for Children

Seventh Edition



Chapter 14

Infant, Child, and Adolescent
Nutrition

Revised by
Laurine Gajkowski, ND, RN, CPN
August 31, 2021

Learning Objectives

- 1. Discuss major nutritional **concepts**
- 2. Describe and plan nursing interventions to meet nutritional needs for all **age groups**
- 3. Integrate methods of nutritional **assessment** into nursing care
- 4. Identify and explain common **nutritional problems**
- 5. Develop **nursing interventions** for children with nutritional disorders.

Learning Objective 14.1

Discuss major nutritional concepts pertaining to the growth and development of children.

Updates from DGA 2020-2025

Dietary Guidelines for Americans 9th edition

By USDA, Department of Health & Human Services

DietaryGuidelines.gov

- The aim of the *Dietary Guidelines* is to promote health and prevent disease.
- **The 2020-2025 Dietary Guidelines carries forward this emphasis on the importance of a healthy dietary pattern as a whole— rather than on individual nutrients or foods in isolation.** Healthy dietary patterns support optimal growth and development.
- **The Science Underlying the Dietary Guidelines Demonstrates That Healthy Eating Across the Lifespan Can Promote Health and Reduce Risk of Chronic Disease**

Nutrition

- Definition : Intake of food/nutrients and assimilation for metabolic use
- Types of nutrients
 - Macronutrients: Major building blocks for body
 - Micronutrients: Trace quantities required

Macronutrients

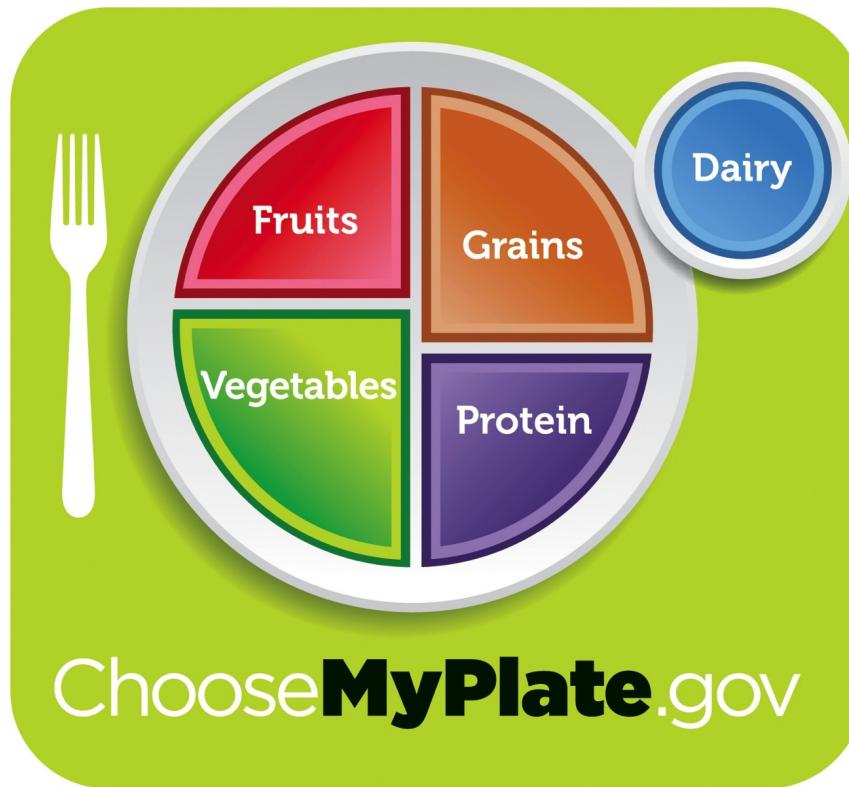
- Types
 - **Carbohydrates**: energy source
 - **Proteins**: role in immunity and signaling, building block for muscles/organs
 - **Fats**: energy source, blood clotting & cellular processing, *brain development (myelin sheath, visual acuity, motor/cognitive function)

Micronutrients

- Fat-soluble vitamins
 - ADEK
 - Toxicity can occur
- Water-soluble vitamins

Nutrient	Function	Fat-soluble vitamins
Vitamin A (and its precursor*, beta-carotene) *A precursor is converted by the body to the vitamin.	Needed for vision, healthy skin and mucous membranes, bone and tooth growth, immune system health	Vitamin A from animal sources (retinol): fortified milk, cheese, cream, butter, fortified margarine, eggs, liver Beta-carotene (from plant sources): Leafy, dark green vegetables; dark orange fruits (apricots, cantaloupe) and vegetables (carrots, winter squash, sweet potatoes, pumpkin)
Vitamin D	Needed for proper absorption of <u>calcium</u> ; stored in bones	Egg yolks, liver, fatty fish, fortified milk, fortified margarine. When exposed to sunlight, the skin can make vitamin D.
Vitamin E	Antioxidant; protects cell walls	Polyunsaturated plant oils (soybean, corn, cottonseed, safflower); leafy green vegetables; wheat germ; whole-grain products; liver; egg yolks; nuts and seeds
Vitamin K	Needed for proper blood clotting	Leafy green vegetables such as kale, collard greens, and spinach; green vegetables such as broccoli, brussels sprouts, and asparagus; also produced in <u>intestinal</u> tract by bacteria

Figure 14-1 The U.S. MyPlate Food Guide Is Used to Provide Teaching About Amounts of Foods Recommended for Daily Intake



Source: From U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2011). Retrieved from <http://www.choosemyplate.gov/>



by eating add up over time, bite by bite.
er. **Start Simple with MyPlate.**



Start simple
with MyPlate

Learning Objective 14.2

Describe and plan nursing interventions to meet nutritional needs for all age groups from infancy through adolescence

<https://www.dietaryguidelines.gov/>



Follow a healthy dietary pattern at every life stage.

At every life stage—infancy, toddlerhood, childhood, adolescence, adulthood, pregnancy, lactation, and older adulthood—it is never too early or too late to eat healthfully.

- **For about the first 6 months of life,** exclusively feed infants human milk. Continue to feed infants human milk through at least the first year of life, and longer if desired. Feed infants iron-fortified infant formula during the first year of life when human milk is unavailable. Provide infants with supplemental vitamin D beginning soon after birth.
- **At about 6 months,** introduce infants to nutrient-dense complementary foods. Introduce infants to potentially allergenic foods along with other complementary foods. Encourage infants and toddlers to consume a variety of foods from all food groups. Include foods rich in iron and zinc, particularly for infants fed human milk.
- **From 12 months through older adulthood,** follow a healthy dietary pattern across the lifespan to meet nutrient needs, help achieve a healthy body weight, and reduce the risk of chronic disease.

Nursing Strategies to Support Nutritional Needs

1. Preterm and small-for-gestational-age (SGA) infants
2. Infancy
 - a. 0 – 6 months
 - b. 6 – 12 months (1st birthday)
3. Toddlers
4. Preschoolers
5. School-age children
6. Adolescents



1. Preterm and Small-for-Gestational-Age (SGA) Infants

- Immature body systems and medical problems
- High calorie/kg needs
- Eating disorders more common

2 a. Infants Age Newborn to 6 Months

- High metabolic rate and growth
 - At 1 month, need 100-115 kcal/kg/day
- Receive about 50% of calories from fat
- Double birth weight by 5 – 6 months

2a. Breastfeeding

Infants Age 0 to 6 Months

- Exclusive feeding for 6 months
- Continue through at least 12 months
- Advantages
 - Excellent nutritional balance
 - Promotion of gastrointestinal function fosters immune defense
 - Psychologic and economic advantages

2a. Formula Feeding

Infants 0 to 6 Months

- Types of formulas
 - Milk or soy based
 - All contain Fe^+
- Specialized formulas for variety of specific needs
 - High calorie
 - Metabolic disorders found through newborn screening
Phenylketonuria (PKU)
 - Hydrolyzed protein
 - Allergies
 - Renal failure

2a. Formula Feeding

0 to 6 Months

- Nursing strategies
 - Education
 - Risk for overfeeding
 - Formula preparation and use
 - Parent–infant relationship
 - Prevention of early childhood caries



Proper Handling and Storage of Human Milk and Infant Formula

- Wash hands thoroughly before expressing human milk or preparing to feed human milk or infant formula.
- If expressing human milk, ensure pump parts are thoroughly cleaned before use.
- If preparing powdered infant formula, use a safe water source and follow instructions on the label.
- Refrigerate freshly expressed human milk within 4 hours for up to 4 days. Previously frozen and thawed human milk should be used within 24 hours. Thawed human milk should never be refrozen. Refrigerate prepared infant formula for up to 24 hours.
- Do not use a microwave to warm human milk or infant formula. Warm safely by placing the sealed container of human milk or infant formula in a bowl of warm water or under warm, running tap water.
- Once it has been offered to the infant, use or discard leftovers quickly (within 2 hours for human milk or 1 hour for infant formula).
- Thoroughly wash all infant feeding items, such as bottles and nipples. Consider sanitizing feeding items for infants younger than 3 months of age, infants born prematurely, or infants with a compromised immune system.

More information on storing and handling human milk is available at [cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm](https://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm). More information on storing and preparing powdered infant formula is available at [cdc.gov/nutrition/downloads/prepare-store-powered-infant-formula-508.pdf](https://www.cdc.gov/nutrition/downloads/prepare-store-powered-infant-formula-508.pdf).

2 b. Infants Ages 6 to 12 Months

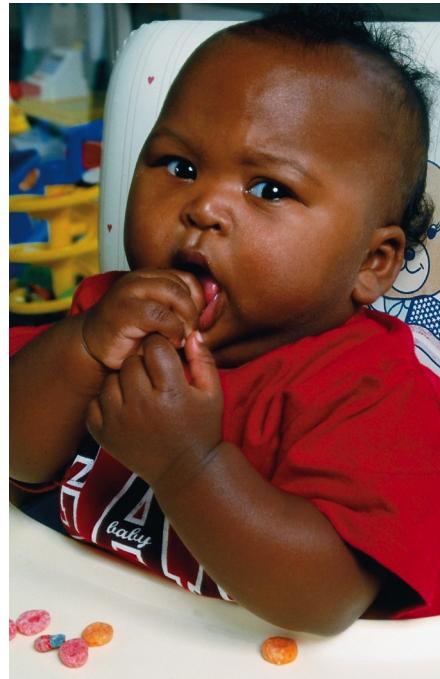
- Readiness for complementary foods
 - Extrusion reflex is fading
 - Sitting skills
- Gradual introduction of additional solids
 - At about 6 months, introduce infants to nutrient-dense complementary foods.
 - Introduce infants to potentially allergenic foods along with other complementary foods.
 - Encourage infants and toddlers to consume a variety of foods from all food groups. Include foods rich in iron and zinc, particularly for infants fed human milk.
 - Avoid foods and beverages with added sugars.
 - Limit foods and beverages higher in sodium.
 - As infants wean from human milk or infant formula, transition to a healthy dietary pattern.

2 b. Infants Ages 6 to 12 Months

- Discuss
 - Commercial vs. homemade foods
 - Timing and approach
 - Do NOT put thinned solids into a bottle with enlarged nipple (unless prescribed for GI reflux or swallowing pathology)
 - Precautions and contraindicated foods
 - choking hazard
 - Honey

Figure 14-3 Introducing Finger Foods

The baby who has developed the ability to grasp with thumb and forefinger should receive some foods that can be held in the hand.



Palmer grasp

2b. Infants Ages 6 to 12 Months

- Weaning
 - Giving up breastfeeding or bottle
 - Introduction of drinking cup about 8 or 9 months
 - Breastmilk or formula
 - Gradual process
 - Should be off bottle by 12 months, never at 18 months
 - Family and infant preferences, cultural patterns



2 b. Infants Ages 6 to 12 Months

- Dental care
 - Early childhood caries (ECC)
 - Prevention strategies
 - Factors in ECC
 - Bottle use
 - Prolonged nursing
 - Juice
 - Lack of Tooth care

Figure 14-2 Early Childhood Caries

This child has had major tooth decay related to sleeping as an infant and toddler while sucking bottles of juice and milk.



Source: Everst/Alamy.

3. Toddlers

- High metabolic demands of infancy slow down.
 - “Physiologic anorexia”
 - Appears toddler does not eat enough
 - Nutritional needs
 - One tablespoon of each food per year of age
 - Intake patterns
 - Healthy meals and snacks
 - Self-feeding preference
 - Let toddler make choices

3. Toddlers

Liquids offered in a cup

Limit fruit juice to 4 oz/day

Give whole milk until age 2 years

- Then switch to 2% milk

Milk intake decreases

- Limit intake of milk to

16 to 24 ounces milk/day

NO!



Figure 14-4 Fostering Healthy Eating Habits

Toddlers should sit at a table or in a highchair to eat to minimize the chance of choking and to foster positive eating patterns.



4. Preschoolers

- Diet like that of toddlers
- Socialization at mealtime
- Enjoy helping with food preparation
- Food jags common
 - Eating only a few foods for several days or weeks
- Three meals and two snacks per day
- Encourage good dental care.

Figure 14-5 Preschoolers Learn Food Habits by Eating with Others



5. School-Age Children

- Nutritional needs increase secondary to growth spurts.
 - Girls by 10 or 11 years
 - Boys about a year later
- May be resistant to new food items
- Encourage appropriate food choices.
- School involvement in nutrition

5. School-Age Children

- Dental care
 - Tooth hygiene (flossing and brushing)
 - Fluoride intake
 - Loss of deciduous teeth
 - Eruption of permanent teeth

6. Adolescents

- Growth rate
- Calorie needs
 - Some males may need nearly 3000 cal/day.
 - Females 2000 cal/day
- Mineral and vitamin needs
- Provide food choices acceptable to teens.

Learning Objective 14.3

Integrate methods of nutritional assessment into nursing care of infants, children, and adolescents.

Analysis of Growth Measures

- Measurement of weight, length, head circumference, body mass index (BMI)
- Use of gender- and age-specific growth charts
- Analysis of growth plots, proportionality, and patterns

Physical Assessment and Laboratory Findings

- Body systems affected by nutrition
- Hematocrit (Hct), hemoglobin (Hgb)
- Serum glucose
- Lipid profile

Table 14–3 Clinical Manifestations of Dietary Deficiencies/Excesses (1 of 2)

Nutrient	Deficiency Manifestation	Excess Manifestation
Vitamin A	Night blindness Skin dryness and scaling	Headache Drowsiness Hepatomegaly Vomiting and diarrhea
Vitamin C	Abnormal hair (coiled shape) Skin abnormalities (dermatitis and lesions) Purpura Bleeding gums Joint tenderness Sudden heart failure	Usually none—excess is excreted in urine
Vitamin D	Rib deformity Bowed legs Bone and joint pain Muscle weakness Periodontal disease Increased rates of respiratory and skin infections/irritation	Drowsiness

Table 14–3 Clinical Manifestations of Dietary Deficiencies/Excesses (2 of 2)

Nutrient	Deficiency Manifestation	Excess Manifestation
B vitamins	Weakness Decreased deep tendon reflexes Dermatitis	Usually none—excess is excreted in urine
Protein	Hepatomegaly Edema Scant, depigmented hair	Kidney failure
Carbohydrate	Emaciation Decreased energy Retarded growth and development	Overweight
Iron	Lethargy Slowed growth and developmental progression Pallor	Vomiting, diarrhea, abdominal pain Pallor Cyanosis Drowsiness Shock

Learning Objective 14.4

Identify and explain common nutritional problems of children.

Food Insecurity, Obesity, Foodborne Illness, Contamination, Nutritional Deficiencies, Celiac,

Food Security and Insecurity

- Food security
 - Access at all times to enough nourishment for a healthy, active life
- Food insecurity
 - Inability to acquire or consume adequate quality or quantity of foods in socially acceptable ways
 - Childhood hunger

Overweight and Obesity

<https://www.cdc.gov/healthyweight/children/>

- A historic and alarming percentage of children are obese and overweight
- Definitions
 - Obese is BMI > 95th percentile
 - Overweight is BMI of 85th to 94th percentile
- Influencing factors
 - Decreased exercise patterns
 - Television and other screen-based activities
 - Percentage of calories as fat
 - Snacking and fast food

Food Safety

- Foodborne illnesses range from mild to severe.
- Children are at risk due to immature gastrointestinal (GI) and immune systems.
- Children who are immunocompromised are at even greater risk.

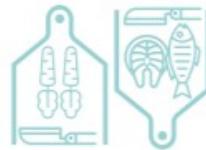
1: Clean

Wash hands and surfaces often.



2: Separate

Separate raw meats from other foods.



3: Cook

Cook food to safe internal temperatures.



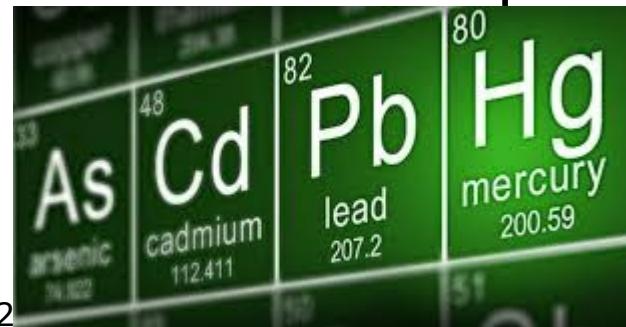
4: Chill

Refrigerate foods promptly.



Heavy Metals Contamination (Mercury, Arsenic, Lead, Cadmium)

- At-risk populations
 - Pregnant women (fetuses)
 - Infants and young children
- Strategies to minimize risks
- <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/2021-02-04%20ECP%20Baby%20Food%20Staff%20Report.pdf>
 - Eliminate high-risk fish from diet
 - Food and Drug (FDA)—recommended intake patterns



Nutritional Deficiencies

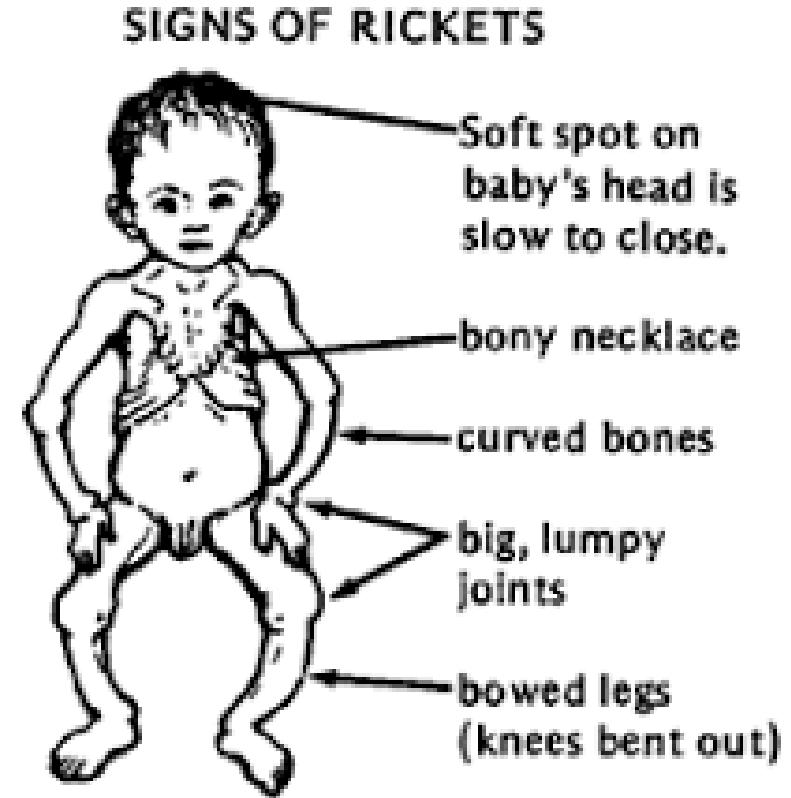
- 1. Iron
- 2. Vitamin D
- 3. Folic acid
- 4. Protein-energy malnutrition

Iron Deficiency

- Iron sources
 - Rice cereal
 - Iron-fortified foods
 - Meats
- Risk groups
 - Infants
 - Adolescents
- Inadequate iron consumption can result in iron deficiency anemia.

Vitamin D Deficiency

- Risks
 - Breastfeeding
- Decreased sunlight exposure
- Health risks
 - Calcium deficiency
 - Rickets
- Supplementation recommendation
 - Vitamin D 400 International Units from birth to 6 months



Folic Acid Deficiency

- Folic acid intake prevents neural tube defects and cleft palate/lip defects.
- At-risk populations
 - Childbearing women
 - Adolescents
- Supplementation
 - 0.4 mg daily
 - Fortified cereals and bread

Protein-Energy Malnutrition

- Both a protein and calorie deficiency
- Protein deficiency
 - Kwashiorkor
 - Associated findings
 - Edema
 - Round face
 - Large abdomen



Learning Objective 14.5

Develop nursing interventions for children with nutritional disorders.

Conditions of Imbalanced Nutritional Intake

- Avoidant/restrictive food intake
 - Failure to thrive (FTT) or feeding disorder
 - Document intake and growth pattern, provide teaching

Conditions of Imbalanced Nutritional Intake (2 of 3)

- Anorexia nervosa
 - Preoccupation with weight, weight loss, and exercise
 - Often involves psychologic aspect, need for control
 - Extreme thinness, emaciation
 - Resulting imbalances may lead to arrhythmias, death
 - Psychologic treatment, nutrition, medication

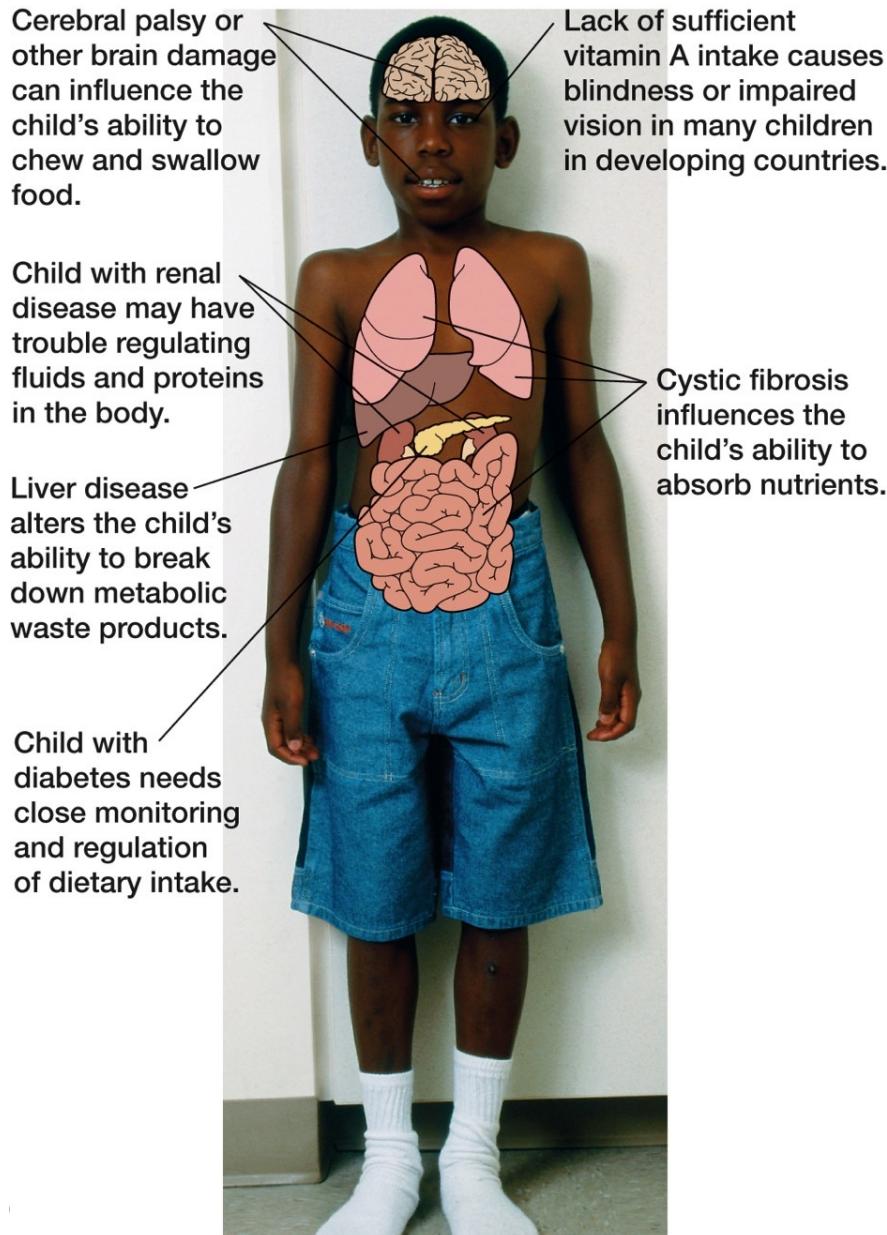
Conditions of Imbalanced Nutritional Intake (3 of 3)

- Bulimia nervosa
 - Binge eating and purging
 - “Silent” disorder, easily concealed
 - Eroded tooth enamel
 - Gum recession and caries
 - Calluses on back of hand
 - Abdominal distention
 - Provide cognitive-behavior therapy along with physiologic care.

Address Nutritional Needs for Children With Health Conditions

- Increased nutritional needs
- Assess factors affecting meeting of nutritional needs.
- Examples of specific conditions

Conditions That Influence Nutritional Needs



Celiac Disease

- Gluten sensitivity or chronic malabsorption
- Immunologic disorder
 - Intolerance to gluten (in wheat, barley, rye, oats)
- Affects intestinal absorption of fat, protein, carbohydrates, calcium, iron, folate, vitamin A, D, E, K,
- Usually presents 6 months to 2 years
- Dietary exclusion allows return to normal growth.

Enteral Therapy

- Uses
- Types
 - Nasogastric
 - Gastrostomy
 - Jejunostomy
- Nursing responsibilities
 - Assessment
 - Monitoring and maintenance of tube and insertion site
 - Administration of feedings

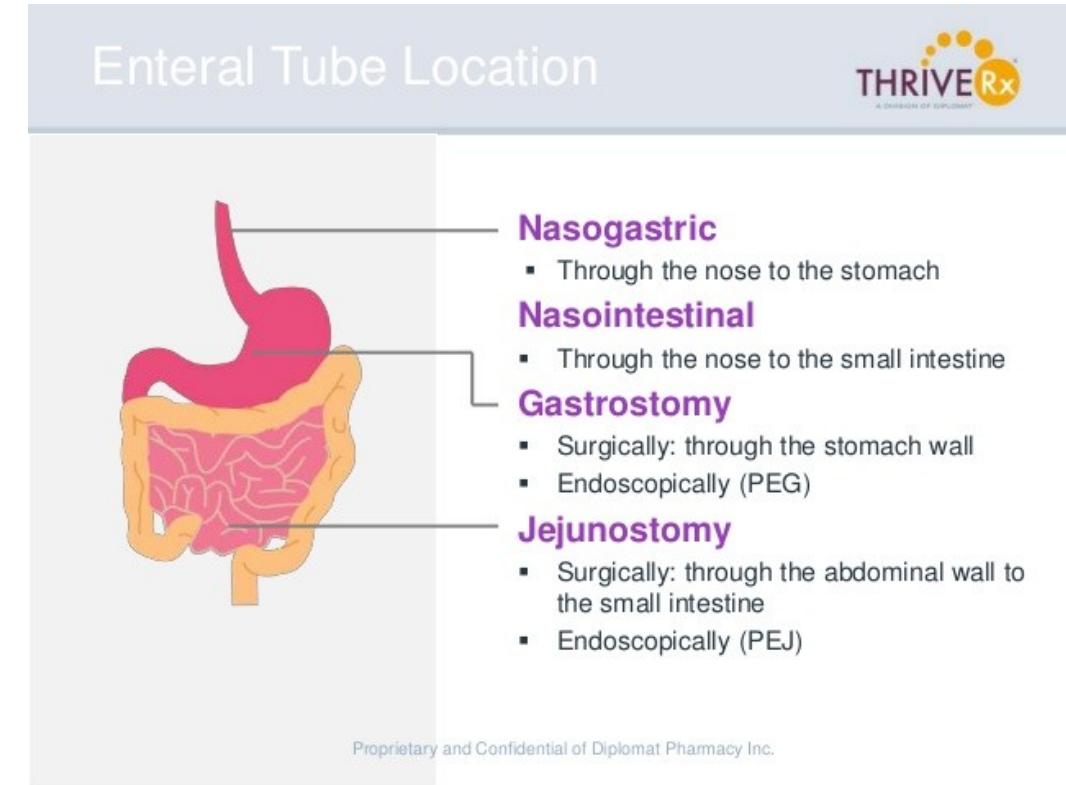
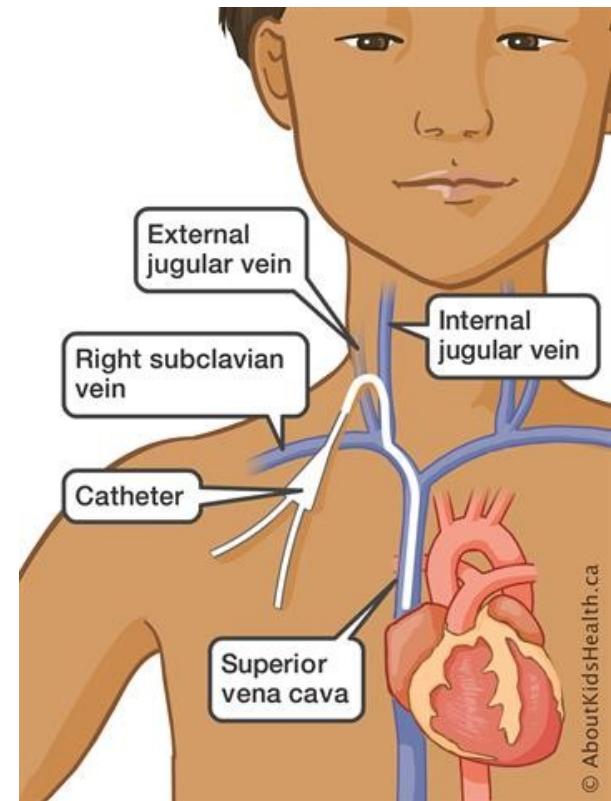


Figure 14-11 Enteral Therapy. This Child Has Returned to School Following Surgery. He Has Difficulty Chewing and Swallowing Food Due to Cerebral Palsy. The School Nurse Has Taught His Teacher How to Safely Administer Some Enteral Feedings During School Hours

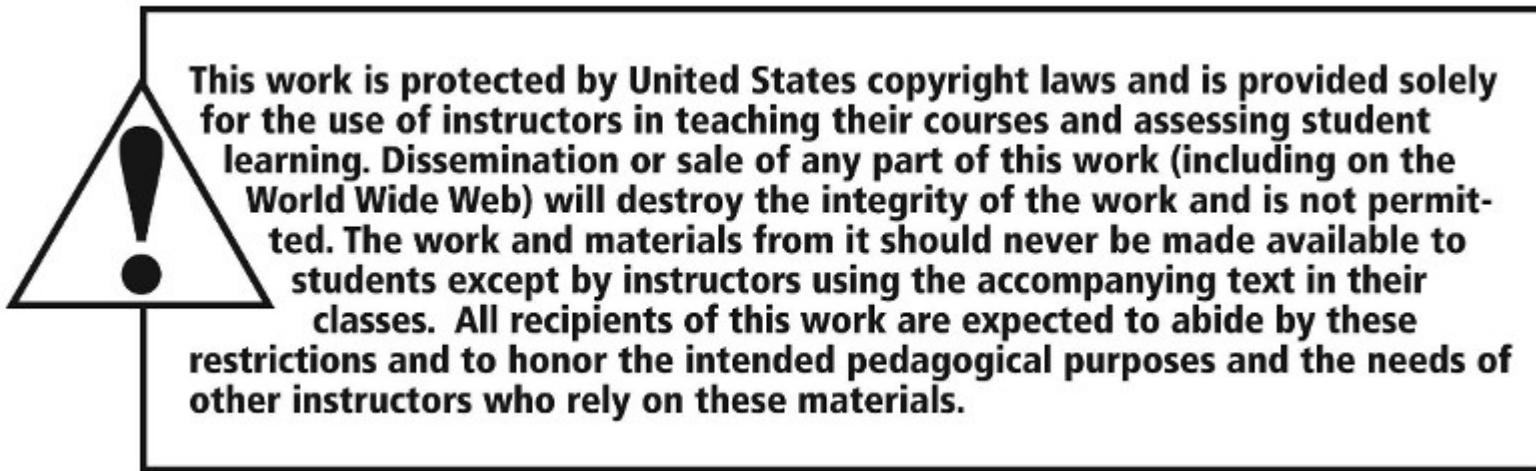


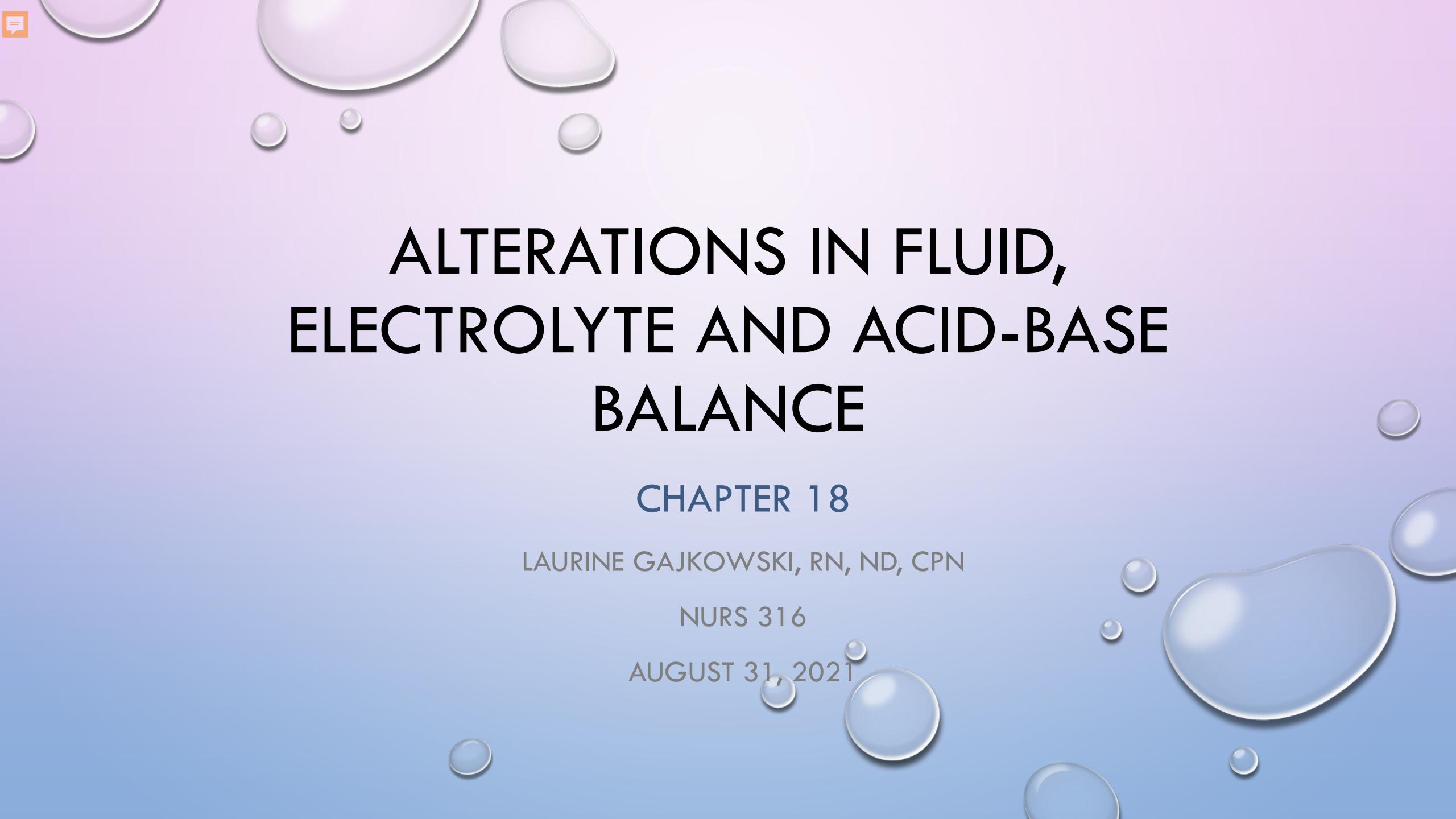
Total Parenteral Nutrition

- Uses (examples: congenital GI malformation, support after bone marrow transplant)
- Solution components
- Lipid emulsions
- Nursing responsibilities
 - Assessment
 - Administration
 - Prevention of complications



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ALTERATIONS IN FLUID, ELECTROLYTE AND ACID-BASE BALANCE

CHAPTER 18

LAURINE GAJKOWSKI, RN, ND, CPN

NURS 316

AUGUST 31, 2021

OBJECTIVES

1. DESCRIBE NORMAL F/E STATUS FOR CHILDREN.
2. IDENTIFY THREATS TO F/E BALANCE IN CHILDREN.
3. DESCRIBE ACID-BASE BALANCE AND RECOGNIZE COMMON DISRUPTIONS.
4. PLAN NURSING CARE FOR CHILDREN EXPERIENCING F/E PROBLEMS AND ACID-BASE IMBALANCES.

- 1) YOUNG CHILDREN ARE AT RISK FOR F/E IMBALANCE DUE TO DIFFERENCES IN BODY FLUID COMPARTMENTS AND REGULATION SYSTEMS.
- 2) PEDIATRIC NURSES INSTITUTE MEASURES TO MAINTAIN NORMAL BODY FLUIDS IN WELL CHILDREN (SUCH AS EXERCISING IN HOT WEATHER) AND ILL CHILDREN (SUCH AS GASTROENTERITIS).
- 3) THE MOST COMMON ELECTROLYTE IMBALANCES INVOLVE SODIUM AND POTASSIUM.
- 4) NORMAL ACID-BASE BALANCE IS NECESSARY FOR PROPER CELL FUNCTION IN THE BODY.
- 5) ALKALOSIS OR ACIDOSIS HAVE EITHER A RESPIRATORY ORIGIN OR METABOLIC ORIGIN.

BODY FLUID

INTRACELLULAR FLUID (I C F)

- 2/3 OF BODY WATER
- MORE DIFFICULT TO DEHYDRATE
- CONTAINS LARGE AMOUNTS OF K⁺

*EXTRACELLULAR FLUID (E C F)

- 1/3 OF BODY WATER
- MORE EASILY LOST → DEHYDRATION
- CONTAINS MOSTLY Na⁺, Cl⁻, AND HCO₃⁻
- LOCATION:
 - INTRAVASCULAR
 - INTERSTITIAL
 - LYMPH
 - TRANSCELLULAR

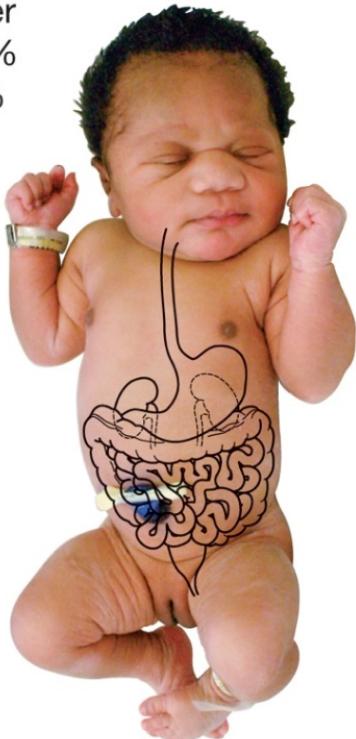
- BODY WATER PERCENTAGE FOR WEIGHT VARIES WITH AGE.
- NEWBORNS HAVE HIGHEST PERCENTAGE OF WATER.
- PERCENTAGE DECREASES WITH INCREASING AGE.

FLUID DIFFERENCES IN CHILDREN

Newborn

75% Total body water

- ECF 45%
- ICF 30%

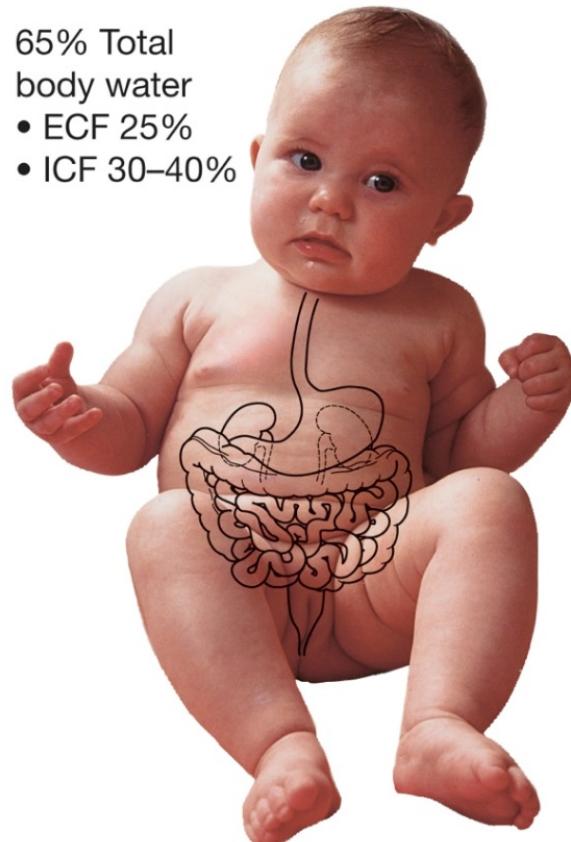


Brain and skin occupy a greater proportion of body weight and are high in interstitial fluid

Infant

65% Total body water

- ECF 25%
- ICF 30–40%



High BSA promotes fluid loss

Little fluid reserve in intracellular fluid

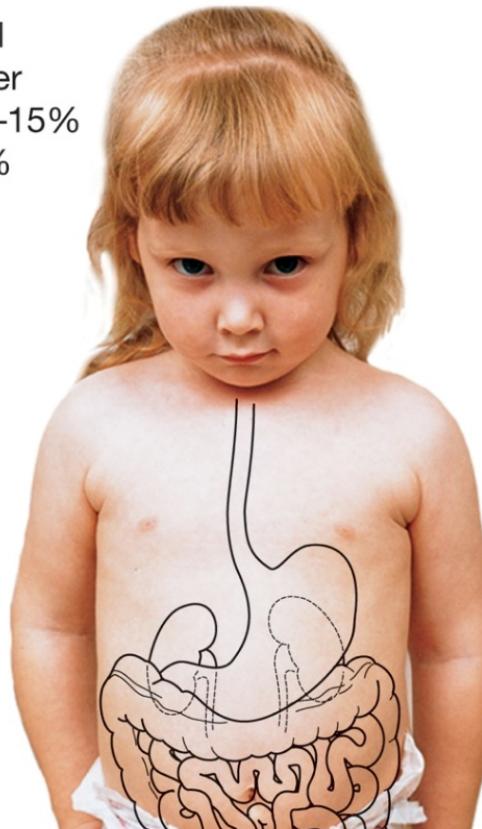
5–6x greater fluid exchange daily

High metabolic rate requires generous fluid intake

Child/Adolescent

50% Total body water

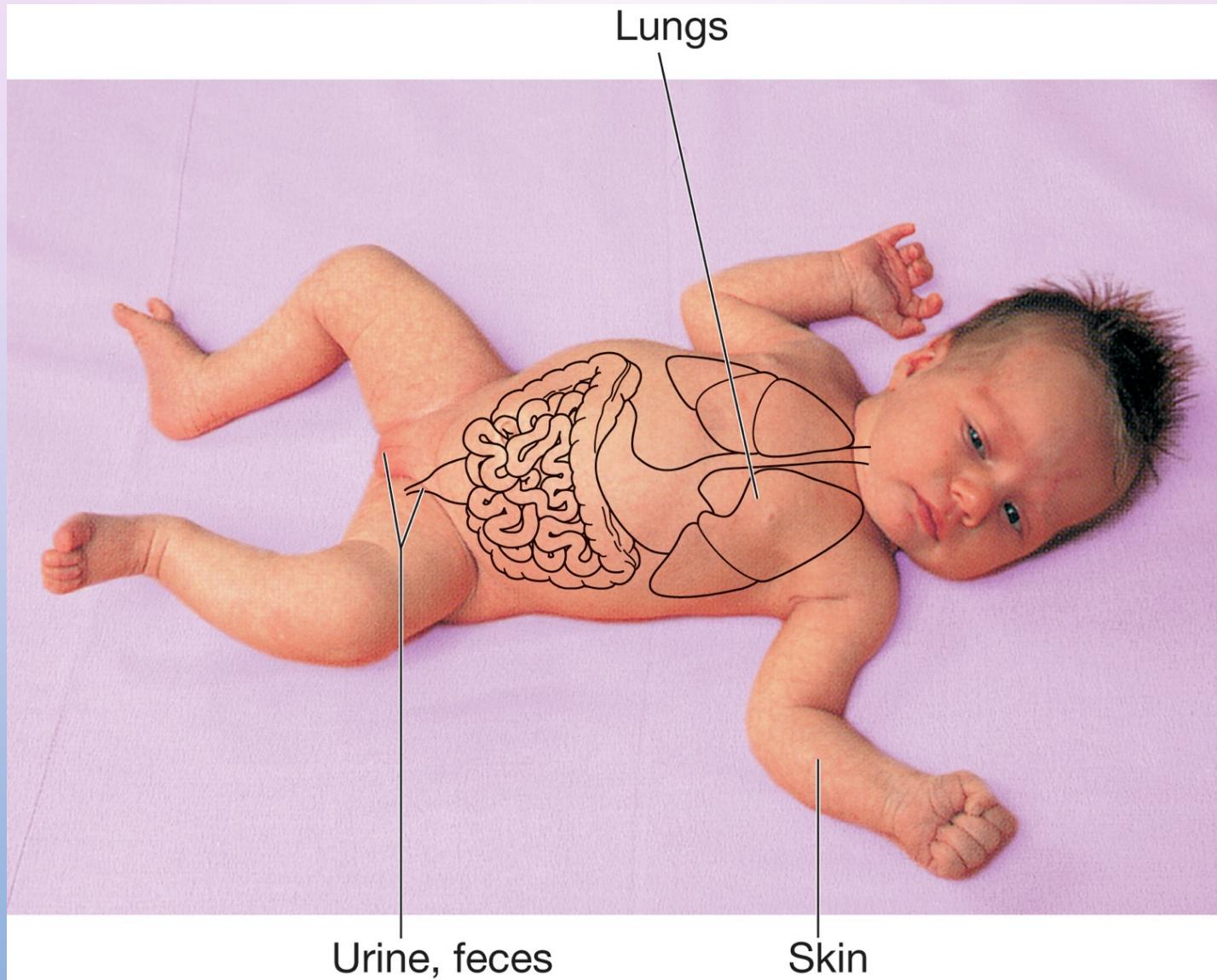
- ECF 10–15%
- ICF 40%



Kidneys are immature until 2 years and unable to conserve water and electrolytes or fully assist in acid-base balance



Figure 18-2 Normal Routes of Fluid Excretion from Infants and Children



F/E IMBALANCES

FLUID VOLUME DEFICIT

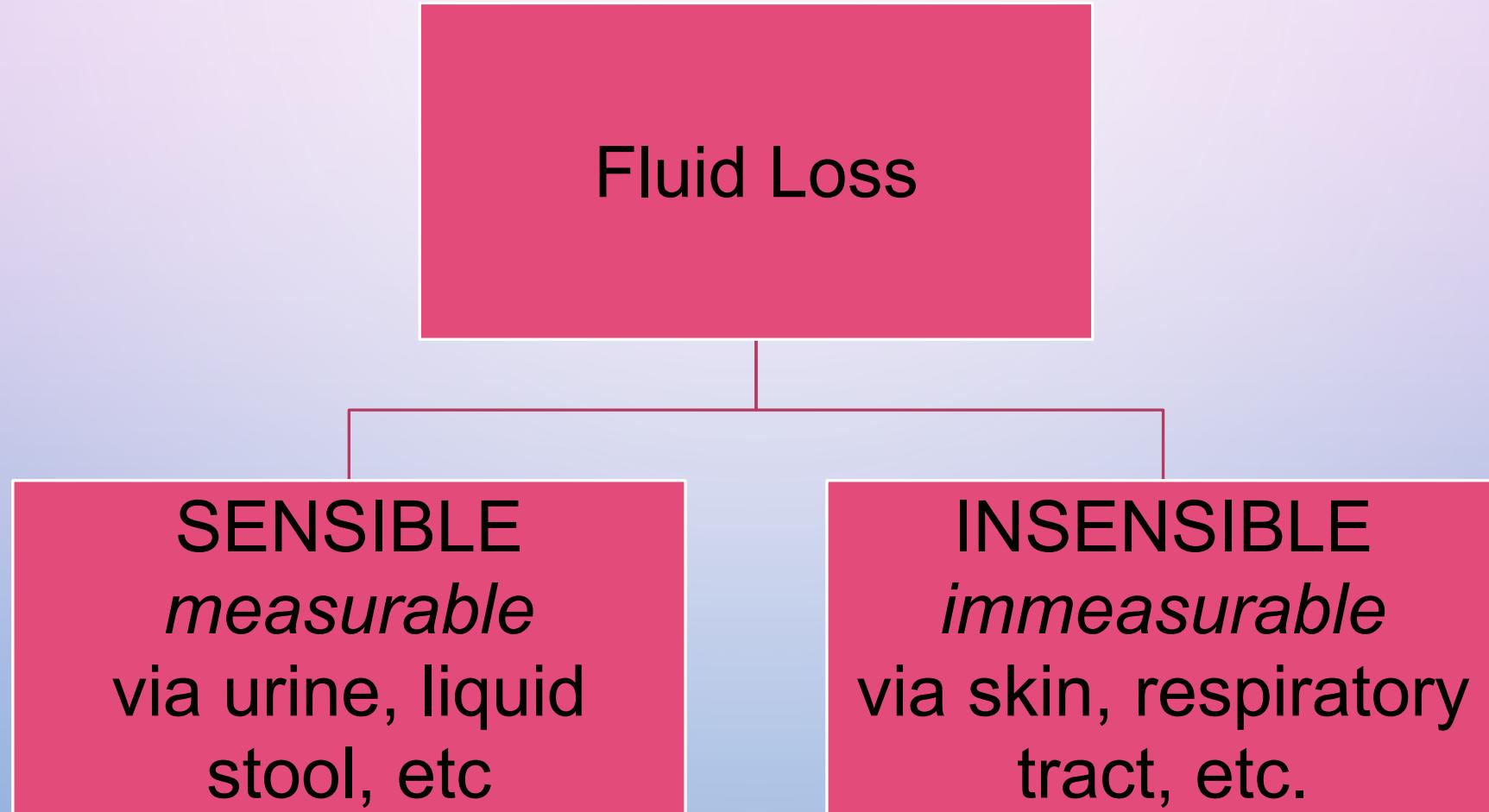
- DEHYDRATION
 - ISOTONIC (Na: 134-143 mEq/L)
 - HYPOTONIC
 - HYPERTONIC

CHILDREN CAN HAVE SEVERE COMPLICATIONS
FROM DEHYDRATION. DEATH CAN OCCUR.

FLUID VOLUME EXCESS

- INTERSTITIAL = EDEMA
- EXTRACELLULAR

UNDER NORMAL CONDITIONS, FLUID INGESTED SHOULD EQUAL FLUID LOST.



DEHYDRATION

- A CRITICAL CONDITION THAT RESULTS FROM AN EXTRACELLULAR FLUID LOSS (TOTAL OUTPUT > TOTAL INTAKE)
- POSSIBLE CAUSES
 - VOMITING
 - DIARRHEA
 - BURNS
 - HEMORRHAGE
 - NASOGASTRIC SUCTIONING AND DRAINAGE LOSS
 - NPO STATUS OR INADEQUATE FLUID/FOOD INTAKE DUE TO ILLNESS
 - OVERUSE OF DIURETICS OR ENEMAS
 - ADRENAL INSUFFICIENCY

Dehydration %	Mild 3-5%	Moderate 6-10%	Severe >10%
Mental status	normal	listless, irritable	lethargy, altered mental status
Heart rate	normal	increased	increased
Quality of pulses	normal	normal to decreased	decreased to thready
Capillary refill	normal	prolonged	prolonged
Blood pressure	normal	normal	normal to decreased
Respirations	normal	tachypnea	tachypnea, deep
Eyes	normal	slightly sunken, decreased tears	sunken, cries without tears
Fontanelle	normal	sunken	sunken
Urine output	normal to decreased	decreased	oliguric or anuric

NURSING CARE

1. PREVENT DEHYDRATION

2. PARENT EDUCATION FOR MILD OR MODERATE

-PROVIDE ORAL REHYDRATION FLUIDS (1-3 TEASPOONS EVERY 10 MINUTES) OR 50/ML/KG IN 2-4 HOURS

3. ACUTE CARE FOR SEVERE

-MONITOR WEIGHT, I&O, HR, BP, SKIN TURGOR, CAP REFILL, FONTANELLE (INFANT), URINE SPECIFIC GRAVITY

-ADMINISTER IV FLUIDS

ECF EXCESS: SALINE EXCESS OR VOLUME OVERLOAD

- EXCESSIVE ALDOSTERONE SECRETION
- CONGESTIVE HEART FAILURE
- LIVER CIRRHOSIS
- CHRONIC RENAL FAILURE
- GLUCOCORTICOID MEDICATIONS
- IMPROPER IV REGULATION BY NURSE

ECF (INTERSTITIAL) FLUID VOLUME EXCESS: EDEMA

- INCREASED BLOOD HYDROSTATIC PRESSURE
- DECREASED BLOOD OSMOTIC PRESSURE (LOW SERUM PROTEIN)
- INCREASED INTERSTITIAL FLUID OSMOTIC PRESSURE (HIGH CAPILLARY PERMEABILITY)
- BLOCKED LYMPH DRAINAGE



ELECTROLYTE IMBALANCES

SODIUM

POTASSIUM

HYPERNATREMIA

- INCREASED OSMOLALITY OF THE BLOOD
- SYMPTOMS ARE THIRST AND MENTAL CHANGES DUE TO SHRINKING OF BRAIN CELLS
- CAUSES ARE
 - A. LOSS OF MORE WATER THAN SODIUM (VOMITING AND DIARRHEA WITHOUT FLUID REPLACEMENT, INADEQUATE ORAL INTAKE, INCREASED ALDOSTERONE)

OR

- B. GAIN OF MORE SODIUM THAN WATER (NO ACCESS TO WATER, TOO HIGHLY CONCENTRATED FORMULA, IV OR HYPERTONIC SALINE)

HYPONATREMIA

- DECREASED OSMOLALITY OF THE BLOOD, TOO DILUTE
- SYMPTOMS ARE MENTAL CHANGES DUE TO SWELLING OF BRAIN CELLS. IT IS A FREQUENT CAUSE OF SEIZURES IN INFANTS UNDER 6 MONTHS.
- CAUSES ARE
 - A. GAIN OF MORE WATER THAN SODIUM(TOO DILUTED INFANT FORMULA, TOO MUCH D₅W IV, TAP WATER ENEMAS)
OR
 - B. LOSS OF MORE SODIUM THAN WATER (VOMITING AND DIARRHEA WITH TAP WATER REPLACEMENT NOT ORS, SWEATING, DIURETICS)
-

HYPERKALEMIA

- K⁺ LEVEL ABOVE 5.5 mmol/L
- SYMPTOMS RELATE TO MUSCLE DYSFUNCTION: HEART, GI (CONSTIPATION), SKELETAL
- CAUSES: RENAL INSUFFICIENCY, TOO MUCH IV POTASSIUM INTAKE, SHIFT OF POTASSIUM OUT OF CELLS (ACIDOSIS)
- NURSING CARE: STOP IV POTASSIUM, EKG, SAFETY, RESTRICT HIGH POTASSIUM FOODS, ADMINISTER CLINICAL THERAPY TO LOWER K⁺ (DIALYSIS, KAYEXALATE, MEDS THAT DRIVE K⁺ INTO THE CELLS).

HYPOKALEMIA

- K^+ LEVEL BELOW 3.7 mmol/L
- SYMPTOMS RELATE TO MUSCLE DYSFUNCTION: HEART, GI, RESPIRATORY, SKELETAL
- CAUSES: EXCRETION OF K FROM GI TRACT (NG LOSSES, BULIMIA, MEDS)
- NURSING CARE: ARRHYTHMIAS, ASSESS FOR LEG WEAKNESS, TEACH ABOUT POTASSIUM RICH FOODS

ACID-BASE IMBALANCES

ACIDOSIS (TOO MUCH ACID)

ALKALOSIS (TOO LITTLE ACID)

RESPIRATORY ACIDOSIS

- CARBONIC ACID EXCESS
- CAUSED BY ANYTHING THAT INTERFERE WITH THE LUNGS ABILITY TO EXCRETE CARBON DIOXIDE (PNEUMONIA, MUSCULAR DYSTROPHY, SLEEP APNEA)

RESPIRATORY ALKALOSIS

- CARBONIC ACID DEFICIT
- CAUSED BY HYPERVENTILATION

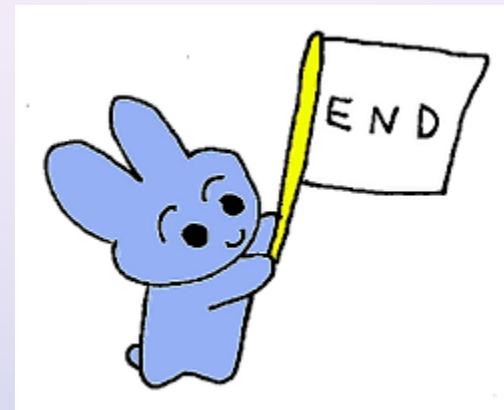
METABOLIC ACIDOSIS

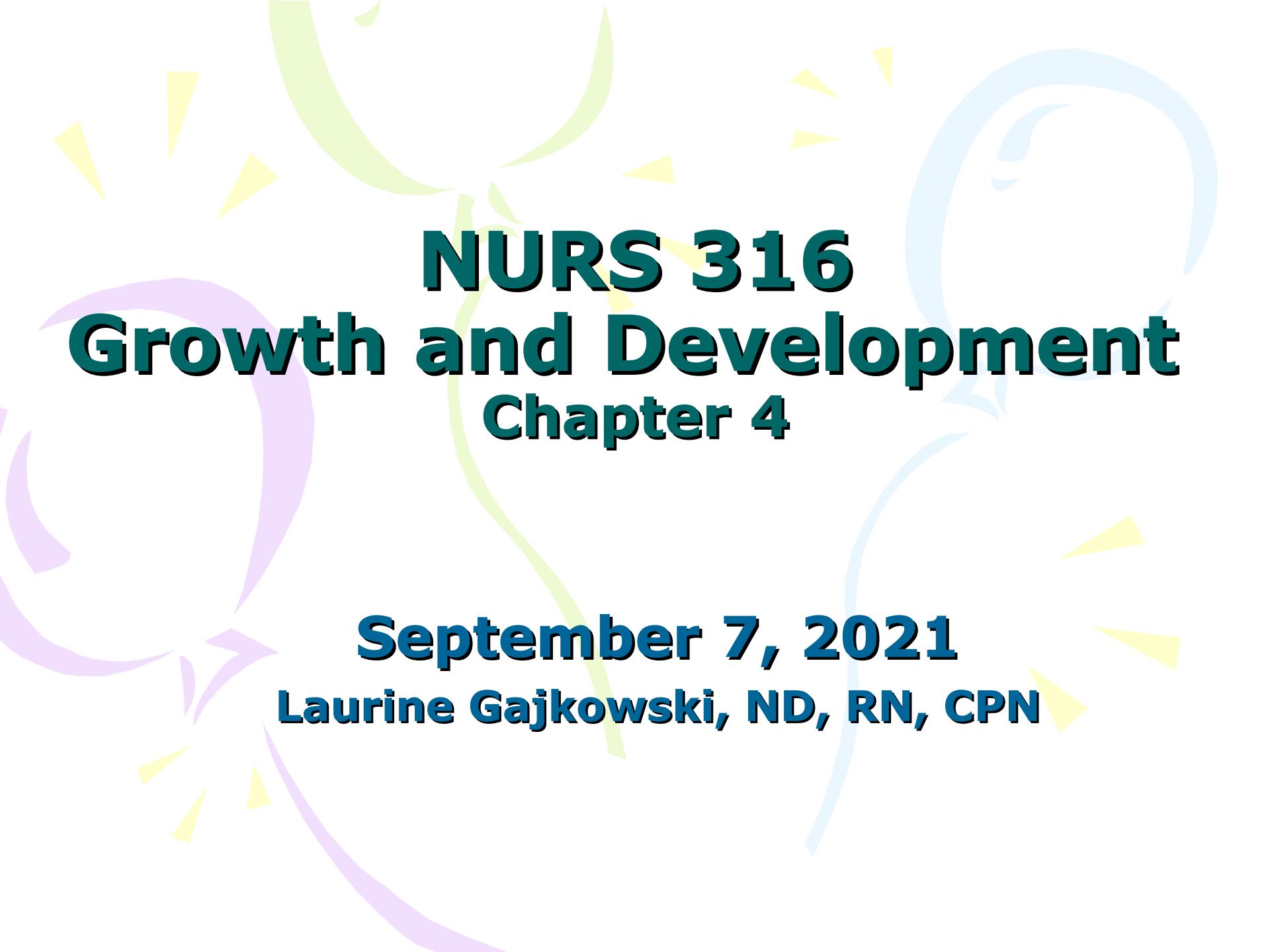
- EXCESS OF ANY ACID OTHER THAN CARBONIC
- CAUSED BY CELLS MAKING ACID THAT CAN'T BE EXCRETED (DKA, STARVATION), EATING ACID, OR LOSING BICARB



METABOLIC ALKALOSIS

- TOO FEW METABOLIC ACIDS
- CAUSED BY EXCESS INTAKE OF BICARBONATE OR EXCESS LOSS OF ACID THROUGH VOMITING (PYLORIC STENOSIS)





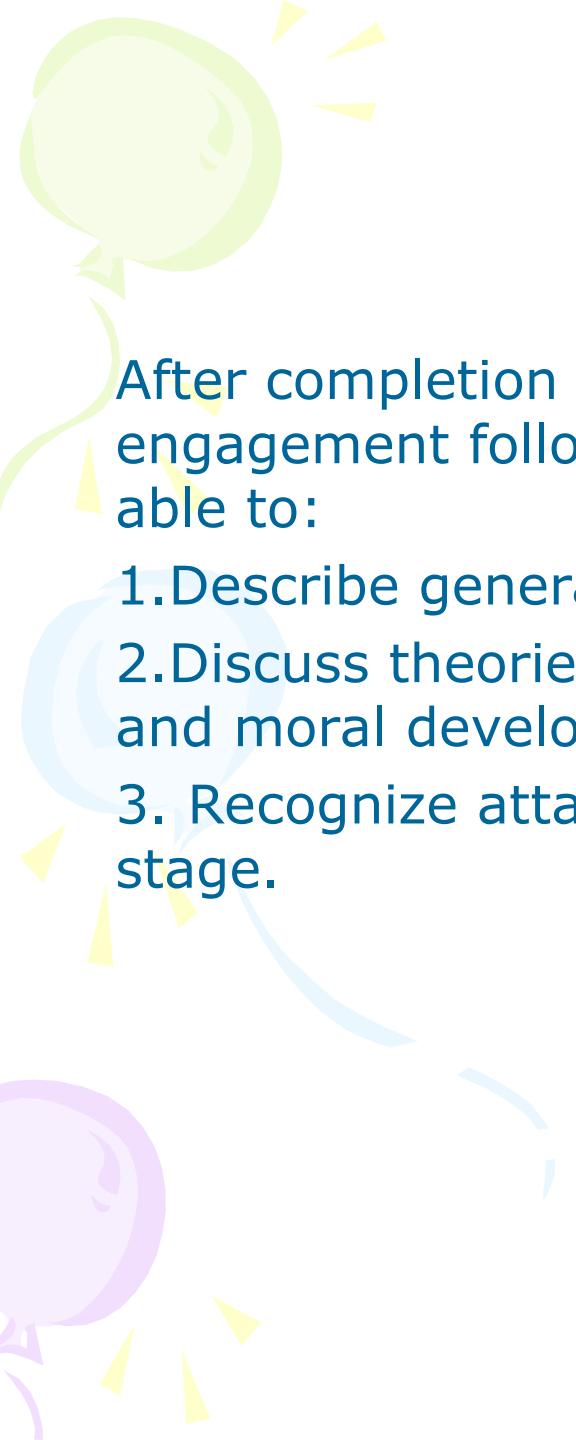
NURS 316

Growth and Development

Chapter 4

September 7, 2021

Laurine Gajkowski, ND, RN, CPN



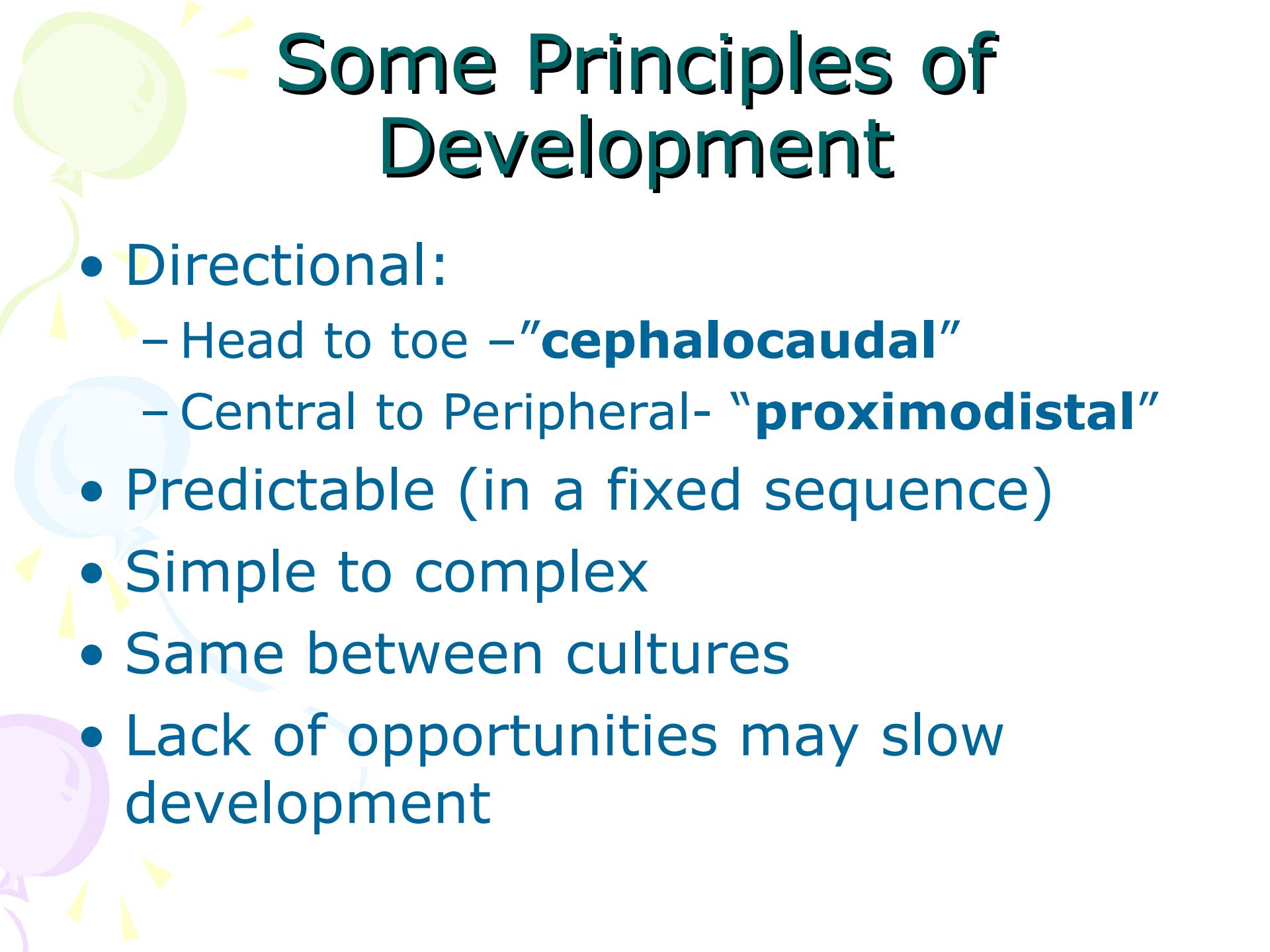
Objectives

After completion of the reading assignment and class engagement following this class, students in NURS 316 will be able to:

1. Describe general principles of G & D.
2. Discuss theories of cognitive, psychosocial, psychosexual, and moral development.
3. Recognize attainment of developmental milestones for each stage.

Growth, Development

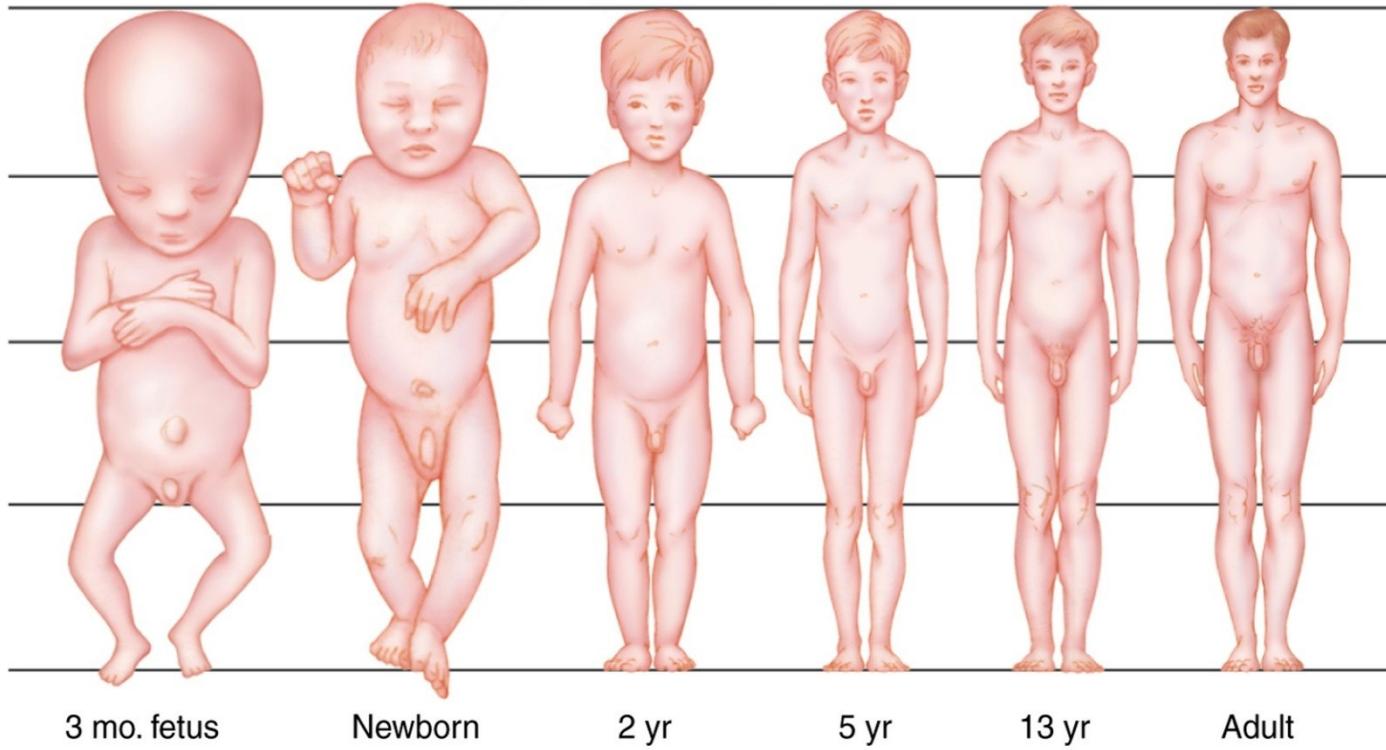
- **Growth:** a physiologic increase in size through cell multiplication or differentiation
 - Increase in weight & length
- **Development:** physiological, psychosocial, and cognitive changes occurring over one's life span due to growth, maturation, and learning.



Some Principles of Development

- Directional:
 - Head to toe – "**cephalocaudal**"
 - Central to Peripheral- "**proximodistal**"
- Predictable (in a fixed sequence)
- Simple to complex
- Same between cultures
- Lack of opportunities may slow development

Body Proportions at various ages





Major Developmental Theories

- Freud
 - Psychosexual stages
- Erikson
 - Psychosocial stages
- Piaget
 - Cognitive stages

- Use Table 4-3
Nursing Applications of Theorists for Age-Specific Care Considerations in your care plan.

Theories of Human Development— Psychoanalytic perspective

Freud: Psychosexual

Id *pleasure seeking*, Ego *reality*, Superego *moral*

Stages:

- 1.oral (birth to 1),
- 2.anal (1-3 years),
- 3.phallic (3-6 years),
- 4.latency (6-12 years),
- 5.genital (>12 years)

<https://www.khanacademy.org/test-prep/mcat/individuals-and-society/self-identity/v/freuds-psychosexual-development>



Erikson: Psychosocial

1. Trust versus mistrust
(0-1 years)
2. Autonomy versus shame & doubt
(1-3 years)
3. Initiative versus guilt
(3-6 years)
4. Industry versus inferiority
(6-11 years)
5. Identity versus role confusion
(12-18 years)

<https://www.youtube.com/watch?v=aYCBdZLCDBQ>

Theories of Human Development— Cognitive by Jean Piaget

Stages (Table 4-3)

1. Sensorimotor (birth to 2 years): learn through sensory/motor capabilities
2. Preoperational (2-7 years): shows curiosity and explorative behavior. Language skills improve. Causality is confused.
3. Concrete operations (7-11 years): Understand the basic properties of and relationships between objects and events, but limited to their own experience (trial and error).
4. Formal operations (>12 years): abstract thinking



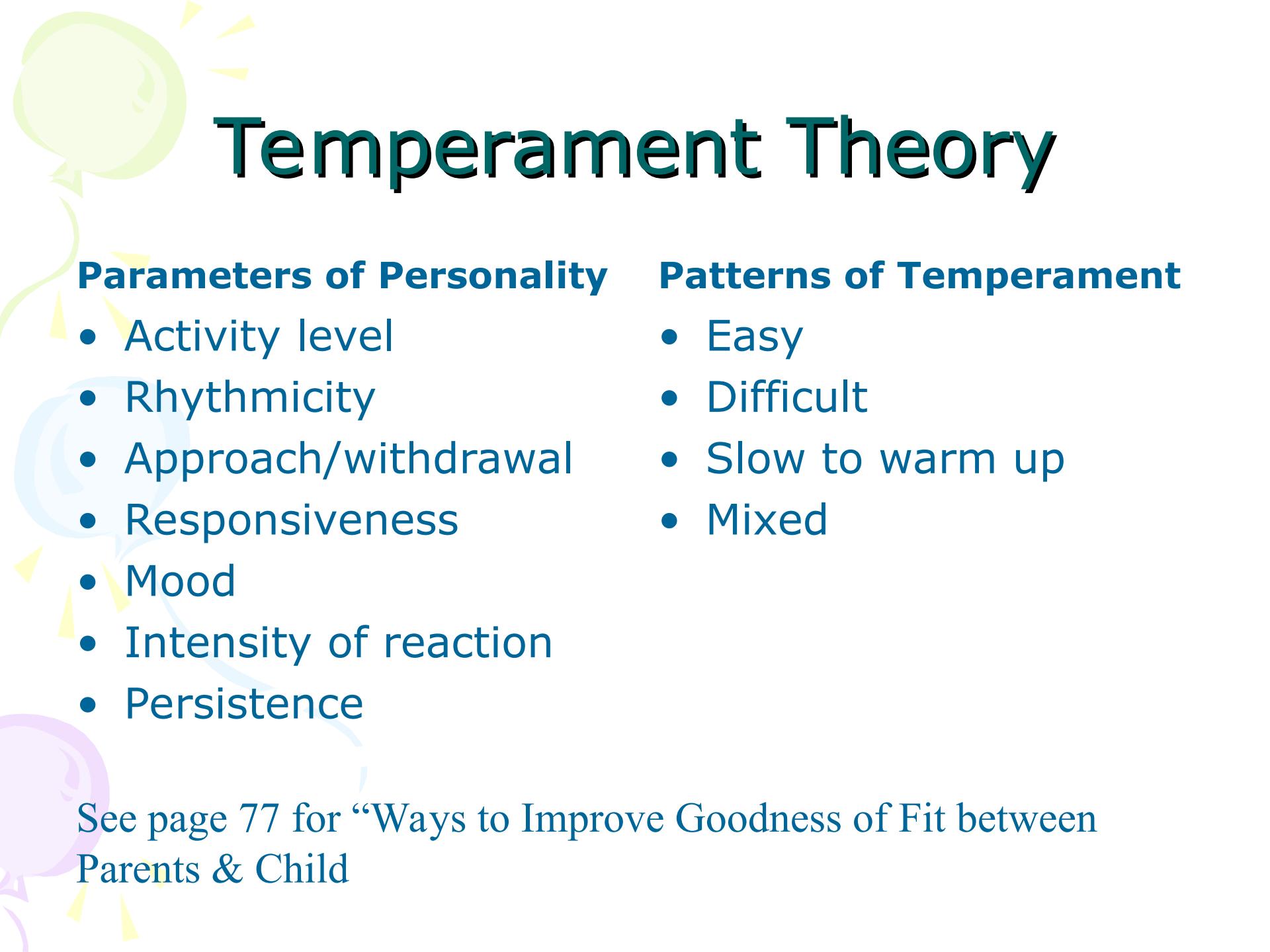
Kohlberg's Theory Moral Development

3 stages

Preconventional (4-7 years) Decisions are based on avoiding punishment

Conventional (7-12 years) Conscience/
Follow rules

Postconventional (12+ years) Ethical standards are internalized/social responsibility



Temperament Theory

Parameters of Personality

- Activity level
- Rhythmicity
- Approach/withdrawal
- Responsiveness
- Mood
- Intensity of reaction
- Persistence

Patterns of Temperament

- Easy
- Difficult
- Slow to warm up
- Mixed

See page 77 for “Ways to Improve Goodness of Fit between Parents & Child

Mnemonic: Child development milestones

- 1 year – single words
- 2 years – 2-word sentences, understands 2-step command
- 3 years – 3-word combo, repeats 3 digits, rides tricycle
- 4 years – draws square, counts 4 objects

Growth & Development of the Newborn





1st 4 weeks of life

Average weight is 3kg

Average HC is 35 cm

Follows objects in line of vision

Lose up to 10% of birth weight, regained by 14 days

Infant Reflexes



*ADAM



Grasp reflex



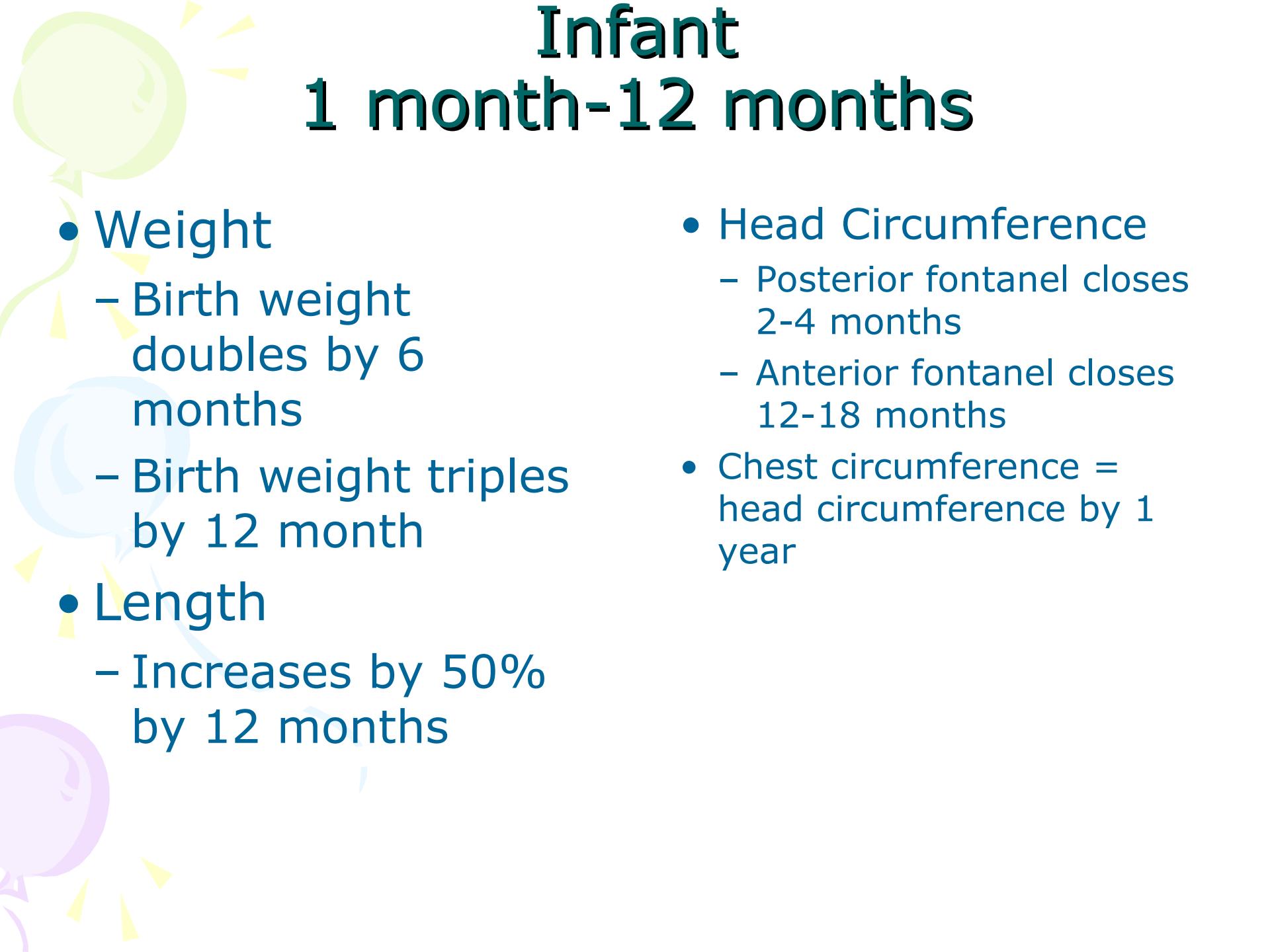
*ADAM

- Moro stimulated by sudden change in position (disappears 4-6 months)
- Tonic neck stimulated by turning baby's head to one side while supine "Fencing" (disappears by 3 months)
- Dance reflex when infant is held upright with one foot touching flat surface (disappears by 4 months)
- Extrusion reflex fades at 4months so solids can be fed
- If neuro damage (CP) then reflexes may persist beyond

Growth & Development of the Infant



<https://www.youtube.com/watch?v=i0fnBTUuRIA>



Infant 1 month-12 months

- Weight

- Birth weight doubles by 6 months
 - Birth weight triples by 12 month

- Length

- Increases by 50% by 12 months

- Head Circumference

- Posterior fontanel closes 2-4 months
 - Anterior fontanel closes 12-18 months
- Chest circumference = head circumference by 1 year

The Period of PURPLE Crying

- P: peak of crying is 2 months, less by 3-5 months
- U: unexpected
- R: resists soothing sometimes
- P: pain-like face
- L: long lasting (2-5 hours per day)
- E: evening, most babies cry more in late afternoon & evening

Gross Motor Development

Average Age that Skill is Attained

- 2-4 months
 - Good head control
 - Support weight with arms
- 4-6 months
 - No head lag
 - Rolls abdomen to back 1st, then back to abdomen
- 6-8 months
 - Sits without support.
 - likes to bounce legs
- 8-10 months
 - Crawls, creeps, scoots
 - Pulls to standing
- 9-12 months
 - Stands alone
 - Walks





1 month

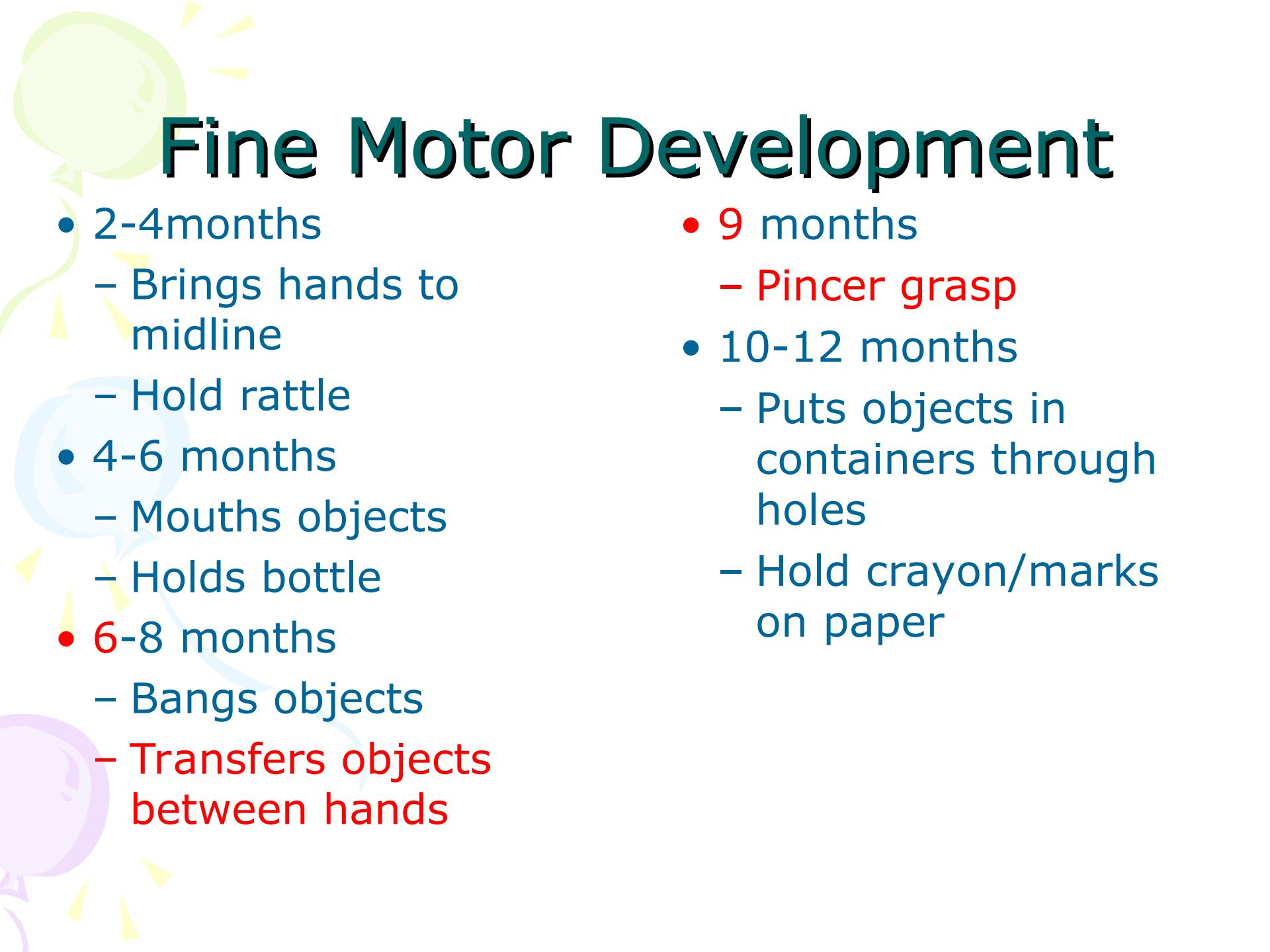


2 months



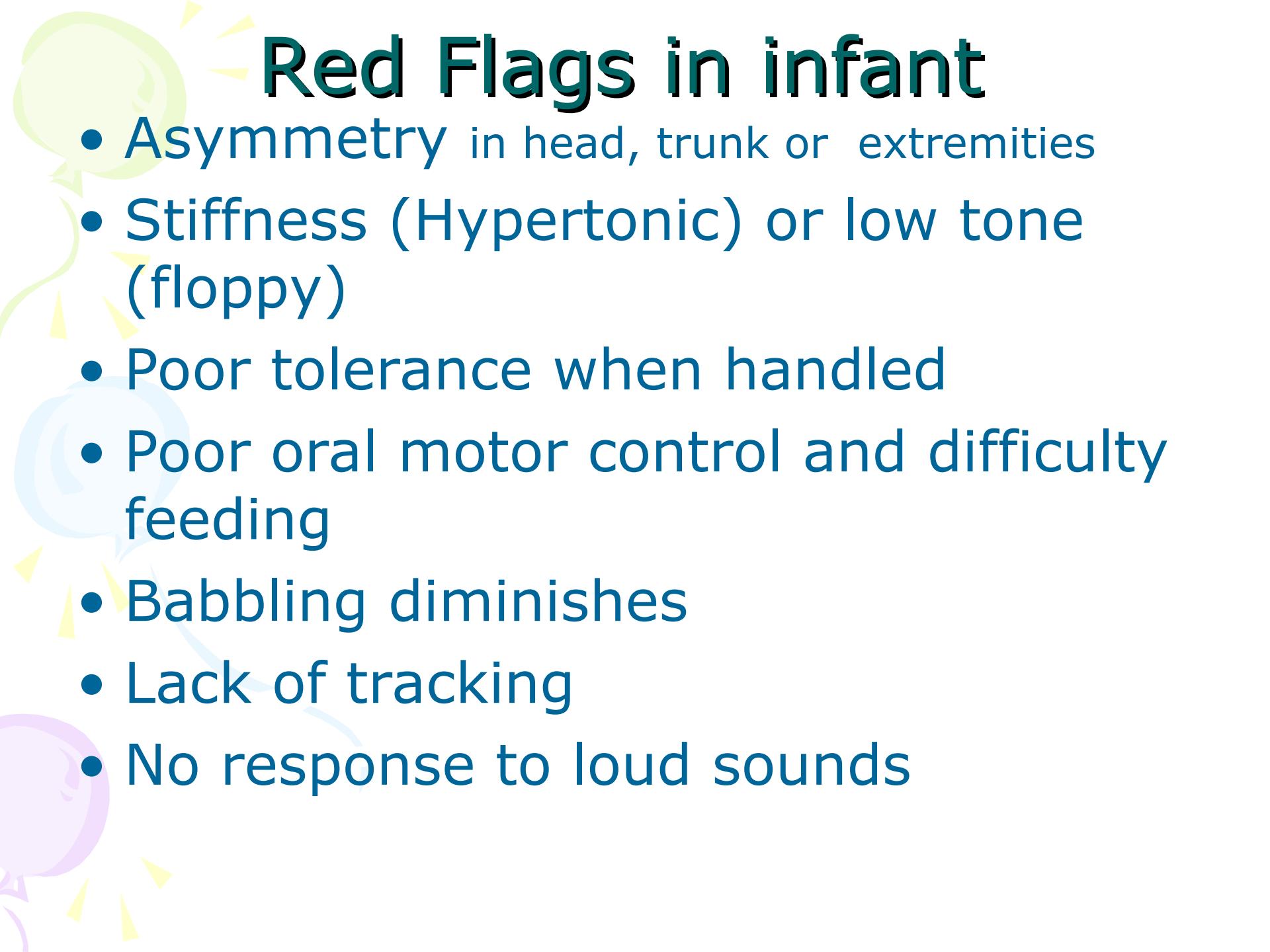
4 months

Degree of Head Lag at Different Age



Fine Motor Development

- 2-4months
 - Brings hands to midline
 - Hold rattle
- 4-6 months
 - Mouths objects
 - Holds bottle
- 6-8 months
 - Bangs objects
 - Transfers objects between hands
- 9 months
 - Pincer grasp
- 10-12 months
 - Puts objects in containers through holes
 - Hold crayon/marks on paper



Red Flags in infant

- Asymmetry in head, trunk or extremities
- Stiffness (Hypertonic) or low tone (floppy)
- Poor tolerance when handled
- Poor oral motor control and difficulty feeding
- Babbling diminishes
- Lack of tracking
- No response to loud sounds

Object Permanence

- Jean **Piaget's** idea that children of about 8-9 months of age develop awareness/the idea that **objects** continue to exist even when one cannot see them.





Growth and Development of the Toddler (1-3 years)



Toddlers

- Exploring the world
- Learning how things work
- Tolerate limitations
- Express desires
- Experience autonomy
- Growth slows
 - Weight: 5 lbs/year
 - Height: 3 in. /year



Toddlers By Systems

- Neurological
 - Improved coordination & equilibrium
 - Myelination of spinal cord completes
- Musculo/Skeletal
 - in muscle strength
 - Finger dexterity improves
- GI/GU
 - 33 months: all deciduous teeth in
 - Self-feeding
 - Control of bladder & bowel
- Cardio/Resp
 - Small airways
- Sensory
 - Vision: 20/20-40
 - Depth perception



Developmental Theories

- Freud:
 - anal stage
- Erickson:
 - Autonomy vs. Shame & Doubt
- Gender identity formed
- Piaget: Sensorimotor (stage 5 & 6) & Preoperational: substages
 - preconceptual

Developmental Milestones

- Walking

- 9-15 months
- Red flag: no walking at 18 months
- 36 months: well balanced

- Feeding

- 15 months grasp spoon
- 18 months drink from cup

- 2 years

- Walks up & down steps with no help

- 3 years

- Pedals tricycle

- Communication

- 12-15 months speaks own language
- 36 months: 300-900 words, 2-3 word phrases, 3-5 word sentences understandable by others

- Play

- Parallel



Red flags in Toddlerhood

- Understandable less than 50% of time
- Marked limited social interaction
- Expressive vocabulary <50 words
- Inability to combine 2 words
- Inability to build a tower of 4 cubes
- Inability to run or kick ball forward

Growth and Development of the Preschooler (3-6 years)

- Time of new initiative & independence
- Can understand and speak clearly
- Busy with projects



Physiological Development & Milestones

- Physical growth
 - Slows
 - Body systems mature: Nighttime control of bladder & bowel by 3+ years
 - Doubles birth height by 4 years; Half of adult height by 5 years

Development

- Cognitive
 - Piaget's preoperational stage
 - Egocentrism
 - Concrete thinking
 - Transductive reasoning
 - Magical thinking
- Language
 - Increased vocabulary
 - Telegraphic speech: 3-4 words in length
- Psychosocial
 - Erikson: initiative versus guilt



Magical Thinking



Play is associative

- Preschoolers interact with others during play but there is not a common goal.
- Fantasy life is powerful
- They engage in **dramatic** play.



Growth and Development of the **School-Aged Child** **(6-12 years)**



Physiological Development

- Dental: Deciduous teeth starting to shed at age 5 and complete by adolescence. 1st permanent tooth appears by age 6.
- Immune system: Acquired Immunity Fully Developed by age 6
- Sexual development: Puberty: on average, 12 years for females; 14 years for males.

Development & Milestones

- Gross and Fine Motor Skill
 - 6-7 years
 - Legibly prints letters; Rides 2-wheel bike; Masters all skills on the Denver II (bathe & dress self); Improved dexterity; tie shoe laces; use knife, fork, & spoon
 - 8-9 years
 - Developing eye-hand coordination; plays team sports; dress self completely; draw 3-dimensional figures
 - 10-12 years
 - Eye-hand coordination well developed; catches a fly ball
 - Fine motor skills well developed
 - Balanced on one foot for 15 seconds

Development & Milestones

- Cognitive (concrete operations)
 - Classification, conservation, reversibility
 - 6-7 years
 - Learning to tell time, to read; Understands right and left
 - Knows value of currency
 - 8-9 years
 - Understand concept of time; know the date and month
 - Understand space, cause, effect, conservation
 - Can make change (small currency)
 - Less animistic in thinking
 - Punctual
 - 10-12 years
 - Developing ability for abstract thinking; Able to write story
 - Drawings are detailed; Truthful; Knows limits
 - Likes to discuss and debate
 - Aware of effect on others

Development & Milestones

- Psychosocial
 - Erikson: industry versus inferiority
 - 6-7 years
 - Need praise and recognition
 - Enjoys games with peers of same gender
 - Demonstrates independence
 - 8-9 years
 - Likes competitive games and sport
 - Social, well behaved; modest
 - Looks up to adults
 - Rules are important; Best friends are important
 - 10-12 years
 - Rules are important
 - Sexual interest, exposed in incorrect info
 - Developing social competency
 - Respects parents; Obedient

School age play is cooperative

COOPERATIVE PLAY

- Children come together and play.
- A group of children with a common goal or similar interests, acting out adult situations or playing formal games.



- The concrete nature of their cognition leads to rules.
- Separation from playmates if hospitalized can lead to sadness and loss of purpose.

Growth and Development of the Adolescent (12-18 years)



Physiological Development

- **Puberty:** State of physical development when secondary sex characteristics begin to appear, sexual organs mature, reproduction first becomes possible, and the adolescent growth spurt starts.
- **Adolescence:** The time of life which begins with puberty and ends when the individual is physically and psychologically mature and able to assume adult responsibilities.

Physiologic Development cont.

- Musculoskeletal System
 - Adolescent growth spurt
 - Female peak height velocity (PHV) — 11 years or 6–12 months before menarche
 - Male peak height velocity — about 13 years
 - Weight increases follow same growth curve as height
- Genitourinary System
 - Menarche occurs 2 years after breast development (Thelarche)
 - Sexual Maturity Rating (SMR)
 - Females: describes breast (1st sign) and pubic hair development
 - Males: describes testes, penis, scrotum, and pubic hair development