PEDIATRIC "PEARLS"

LCDR Anne Dufek, MS, CPNP-PC, RN, CPHON
Nurse Practitioner
National Cancer Institute, Pediatric Oncology Branch

Webinar Description:

The goal of this activity is to provide timely information on national public health initiatives and priorities to improve nurse's understanding of how their work contributes to public health practice to improve population health outcomes.

This presentation will address growth, development, and assessment of pediatric patients, as infants, toddlers, preschoolers, school-age children, and adolescent, highlighting that children are not "little adults". Public health trends important to the care of infants, children, and adolescents, such as immunizations, dental health, suicide, and adolescent risky behaviors will also be addressed.

Target Audience:

This webinar is designed for Registered Nurses and Nurse Practitioners

Learning Objectives:

- Explain the nursing implications of the topic addressed during the presentation.*
- Describe how the nurse's work contributes to public health practice and population health. *
- Discuss priority health and policy issues that address current and emerging public health problems and issues
- Describe impact of intersection of public health and nursing science in practice at the population and community level as it relates to achieving health outcomes

Sponsored By:

The United States Public Health Service – Nursing Professional Advisory Committee, Career Development Subcommittee and the CDC Nurse Working Group. There is no cost for this learning activity. The presenters for this presentation have declared no conflicts of interest.

Accreditation Statements:

In support of improving patient care, The Centers for Disease Control and Prevention is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

CNE:

The Centers for Disease Control and Prevention designates this activity for (1) nursing contact hours.

Disclosures:

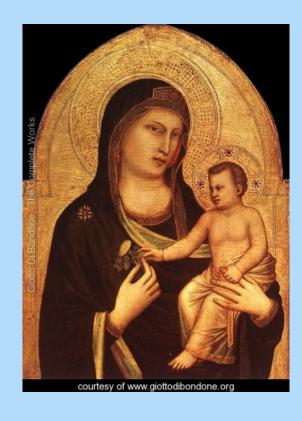
In compliance with continuing education requirements, all presenters must disclose any financial or other associations with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters as well as any use of unlabeled product(s) or product(s) under investigational use.

CDC, our planners, presenters, and their spouses/partners wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters. Planners have reviewed content to ensure there is no bias.

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CDC did not accept commercial support for this continuing education activity.

CHILDREN ARE NOT SMALL ADULTS



Giotto - 1320 National Gallery of Art, Washington, DC



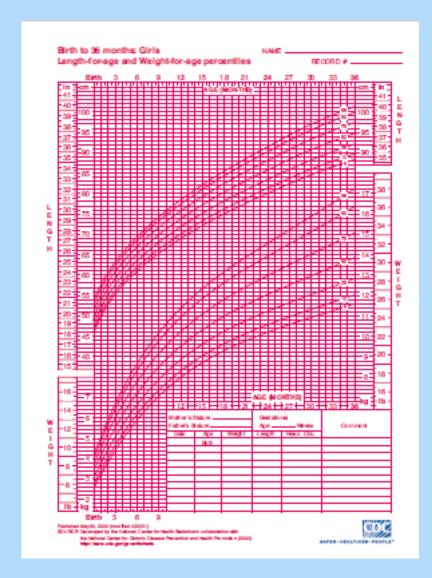
Raphael – 1505 National Gallery of Art, Washington, DC

Adapted from "Children are not Little Adults; Children's health and environment. www.who.int/ceh. 2008

GROWTH & DEVELOPMENT

GROWTH & DEVELOPMENT

- Growth: Implies an increase in size (doesn't necessarily include development)
 - Plotted on CDC Growth Charts
- Development: Maturation of structures and includes growth
- PARENT/CAREGIVER EDUCATION IS ESSENTIAL!
 - Share growth percentiles at each visit
 - Discuss risk factors
 - Anticipatory guidance
 - Nutrition counseling
- Age:
 - Chronological
 - Developmental
 - Adjusted/Corrected



INFANT (Birth-12 Months)



- TRUST of "caregiver" (Psychosocial)
 - Separation/stranger anxiety begins between 6-12 months
 - Soothe/calm infant during procedures
 - Non-nutritive sucking
 - Swaddling
- Learns through interactions with the environment (Cognitive)
 - Provide developmentally appropriate toys
 - Young infant: Rattles, tummy time
 - Older infant: Peek-a-Boo, blocks & cup, high chair with food
- "Back to Sleep"
- Nutrition

TODDLER (12-36 Months)



- Foster autonomy through freedom and encouragement to master new things (Psychosocial)
 - Love to explore the environment and take advantage of new mobility and independence, but CAN'T recognize danger
 - Allow supervised "play" with equipment
- Learns through interactions with the environment (Cognitive)
 - Provide developmentally appropriate toys (blocks, shapes, colors, dolls, etc.)
- Stranger and separation anxiety (transitional objects)
- Increasing verbal skills, short attention spankeep things short, simple, and concrete
- Use distraction during procedures
- Give choices/be flexible

PRE-SCHOOL (3-5 Years)



- Promote initiative without impinging on the rights of others (Psychosocial)
 - Learning through play
 - Explain procedures and allow play before procedure
- Non-logical and non-linear thinking (Cognitive)
 - Engages in fantasy/dramatic play and has difficulty separating fantasy from reality
- Needs parent present when under stress
- Increasing fears (Pain, the dark, loss of control, mutilation)
- Positive reinforcement (Stickers and rewards)
- Promote cooperation, give choices, and set limits

SCHOOL AGE (6-12 Years)



- Focus on achievement (school) and social relationships (Psychosocial)
 - Takes pride in accomplishments
- Thinking is now logical, linear, concrete, tangible (Cognitive)
- Loves science, gadgets, and learning how the body works
- Still needs parent, especially in stressful situations
- Explain procedures, allow play before hand, and allow time for questions
- Can begin to use imagery during painful or difficult procedures

ADOLESCENT (13-18 Years)



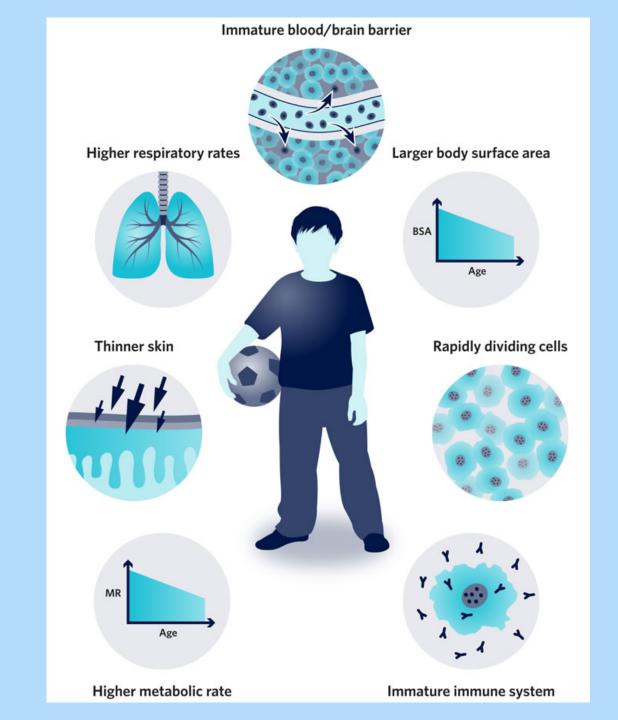
- Self-identify; Integrates own values with society (Psychosocial)
 - Quest for independence reaching peak
 - Acutely focused on body image-may view illness in terms of effects on appearance and body function
- Adaptable, flexible, abstract thought (Cognitive)
 - Ability to understand consequences
- May be angry about illness; may regress
 - Encourage verbalization of feelings about illness (with parents and by themselves if possible) and offer extra support as needed
- Privacy, confidentiality
- Risky behaviors
- Peer education

POSITIVE (PARENTING) STRATEGIES

- Attend to the Child Individually
 - Allow the child to make reasonable choices
 - Respond to the child's bids for attention with eye contact and smiles
 - Comment on child's appropriate and desirable behavior frequently and positively
- Listen Actively
 - Paraphrase or describe what the child is saying
 - Avoid giving commands, judging, or editorializing
 - Follow the child's lead in the interaction
- Convey Positive Regard
 - Give directions positively, firmly, and specifically
 - Provide notice before requiring the child to change activities
 - Label the behavior, not the child
 - Avoid shaming or belittling the child
 - Strive for consistency

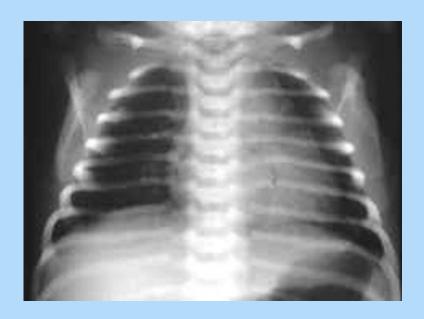
ASSESSMENT

HOW ARE KIDS DIFFERENT FROM ADULTS?



DIFFERENCES

- Airway:
 - Disproportionally larger head
 - Disproportionally shorter neck
 - Disproportionately bigger tongues
 - Smaller tracheal length
 - Newborns are obligate nose breathers
 - Poor cervical spine support
 - Airways are proportionately smaller
- Cardiovascular: The adult heart can increase the strength of contractions as well as rate, the pediatric heart has low compliance for its size and can only effectively increase its stroke volume by increasing its rate
- Cardio-Thoracic





NORMAL VITAL SIGNS



AMERICAN ASSOCIATION CRITICAL-CARE NURSES

PALS

Vital Signs in Children

These 3 tables are reproduced or modified from Hasnish MF. Children are different, in: Aursing Care of the Critically IF Child. 3rd ed. Mosby, 2013:1-18, copyright Bisevier.

Normal Heart Rates*

Age	Awake rate	Steeping rate (beats/min)
Neonate	100-205	90-160
Infant	100-180	90-160
Toddler	98-140	80-120
Preschooler	80-120	65-100
School-age child	75-118	58-90
Adolescent	60-100	50-90

"Mixeys consider the patient's normal range and clinical condition. Heart rate will normally increase with fever or stress.

Normal Respiratory Rates*

Age	Rate (breaths/min)
Infant	30-53
Toddler	22-37
Preschooler	20-28
School-age child	18-25
Adolescent	12-20

"Consider the patient's normal range. The child's respiratory rate is expected to increase in the presence of fever or stress.

Data from Fleming Siet al. Lancet. 2011;37799770:1011-1018.

Normal Blood Pressures

Age	Systolic pressure (mm Hg)*	Diastolic pressure (mm Hg)*	Mean arterial pressure (mm Hg)*
Birth (12 h, <1000 gl	39-59	16-36	28-42
Birth (12 h, 3 kg)	60-76	31-45	48-57
Neonate (96 h)	67-84	35-53	45-60
Infant (1-12 mo)	72-104	37-56	50-62
Toddler (1-2 y)	86-106	42-63	49-62
Preschooler (3-5 y)	89-112	46-72	58-69
School-age child (6-9 y)	97-115	57-76	66-72
Preadolescent (10-12 y)	102-120	61-80	71-79
Adolescent (12-15-y)	110-131	64-83	73-84

CALCULATING PEDIATRIC BLOOD PRESSURES

Blood Pressure Levels for Boys by Age and Height Percentile

ВР ———				Systo	Systolic BP (mmHg)					Diastolic BP (mmHg)						
Age	Percentile		•	Perce	ntile of	Height	→			•	Perce	entile of	Height	→		
(Year)	•	5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th	
1	50th	80	81	83	85	87	88	89	34	35	36	37	38	39	39	
	90th	94	95	97	99	100	102	103	49	50	51	52	53	53	54	
	95th	98	99	101	103	104	106	106	54	54	55	56	57	58	58	
	99th	105	106	108	110	112	113	114	61	62	63	64	65	66	66	
2	50th	84	85	87	88	90	92	92	39	40	41	42	43	44	44	
	90th	97	99	100	102	104	105	106	54	55	56	57	58	58	59	
	95th	101	102	104	106	108	109	110	59	59	60	61	62	63	63	
	99th	109	110	111	113	115	117	117	66	67	68	69	70	71	71	
3	50th	86	87	89	91	93	94	95	44	44	45	46	47	48	48	
	90th	100	101	103	105	107	108	109	59	59	60	61	62	63	63	
	95th	104	105	107	109	110	112	113	63	63	64	65	66	67	67	
	99th	111	112	114	116	118	119	120	71	71	72	73	74	75	75	
4	50th	88	89	91	93	95	96	97	47	48	49	50	51	51	52	
	90th	102	103	105	107	109	110	111	62	63	64	65	66	66	67	
	95th	106	107	109	111	112	114	115	66	67	68	69	70	71	71	
	99th	113	114	116	118	120	121	122	74	75	76	77	78	78	79	
5	50th	90	91	93	95	96	98	98	50	51	52	53	54	55	55	
	90th	104	105	106	108	110	111	112	65	66	67	68	69	69	70	
	95th	108	109	110	112	114	115	116	69	70	71	72	73	74	74	
	99th	115	116	118	120	121	123	123	77	78	79	80	81	81	82	

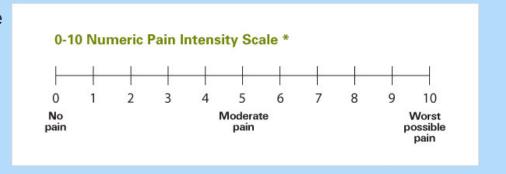
PAIN

Assessment:

- FLACC: For infants and toddlers or those with cognitive impairment
- FACES: 3-7 years old
- Numeric: 8+ years old
- Non-Pharmacologic Management:
 - Infants
 - Non-nutritive sucking, skin to skin, swaddling, rocking
 - Toddlers/Preschoolers
 - Blow bubbles, toys that light up, alphabet song, singing, reading, videos, stickers
 - School-aged children
 - Give choices, blowing bubbles, singing songs, squeeze balls, relaxation breathing and playing with electronic devices, videos, reading, imagery, stickers
 - Adolescents
 - Deep breathing, videos, option of privacy, music, squeeze balls, imagery

Criteria	Score - 0	Score - 1	Score - 2
	No particular	Occasional grimace or	Frequent to constant
Face	expression or	frown, withdrawn,	quivering chin,
	smile	disinterested	clenched jaw
1	Normal position	Uneasy, restless,	Kicking, or legs
Legs	or relaxed	tense	drawn up
	Lying quietly,	Squirming, shifting	Arched, rigid or
Activity	normal position,	back and forth, tense	jerking
	moves easily		
	No cry (awake or	Moans or whimpers;	Crying steadily,
Cry	asleep)	occasional complaint	screams or sobs,
			frequent complaints
	Content, relaxed	Reassured by	Difficult to console or
Consolabilian		occasional touching,	comfort
Consolability		hugging or being	
		talked to, distractible	





ASSESSMENT

- A, B, C's (ie, APPEARANCE, Breathing, Circulation)
 - Able to perform from the "doorway", without even touching the child; Noninvasive and non-threatening
 - Appearance:
 - Abnormal tone, decreased interactiveness, difficult to console, abnormal look/gaze, abnormal speech/cry?
 - Breathing:
 - Abnormal sounds, abnormal positioning, retractions, nasal flaring, gasping, apnea?
 - Circulation:
 - Pallor, mottling, cyanosis?

PEWS: PEDIATRIC EARLY WARNING SIGNS

able 1.1	0	1	2	3	Score
	Pink or capillary refill	Pale or capillary refill	Grey or capillary refill 4 seconds.	Grey and mottled or capillary refill ≥5 seconds.	
Cardiovascular	1-2 seconds.	3 seconds.	Tachycardia of 20 above normal rate.	Tachycardia of 30 above normal rate or bradycardia.	
Respiratory	Within established baseline.	≥10 above established baseline.	≥20 above established baseline.	≥30 above established baseline.	
	No retractions	Mild Contractions	Moderate Contractions	Severe Contractions Grunting	
	Room Air	Up to 2L/min or 30%	Up to 4L/min or 40%	Up to 5L/min or 50%	
Behavior	Playing/Appropriate	Irritable, but	Irritable and Inconsolable	Lethargic or Confused	
	or Sleeping	Consolable	Restless or Pain	Reduced Response to Voice or Pain	
core an additional 2	ots for nebulizer use, s	uctioning, or persisten	t vomiting after surger	ry.	
		<u> </u>		Total	

Table 1.2	Retraction Severity	
Mild	Moderate	Severe
Subcostal or Substernal	Intercostal or Supraclavicular	Suprasternal or Sternal



PEDIATRIC MEDICATION ADMINISTRATION

MEDICATION ADMINISTRATION

- **WEIGHT-BASED DOSING**
- Why it's difficult:
 - Child's lack of understanding of the illness and/or purpose of medication
 - Emotional reasons related to being ill and/or having to take medications
 - Physical difficulties related to swallowing medications and managing side effects
- Parent & Nurse Resource: "Medicine & Your Child: A Guide for Parents on Adherence and Administration"
 - https://ccr.cancer.gov/sites/default/files/medbooklet.pdf

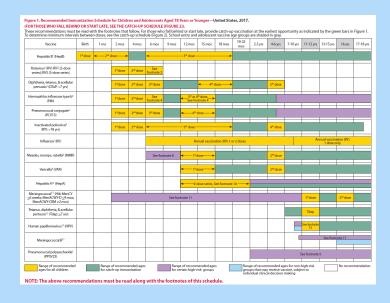
PEARLS FOR MEDICATION ADMINISTRATION

- Be honest and sympathetic
 - "I know that you don't like taking medicine, but your body needs to the medicine to feel strong"
 - "I'm sorry it tastes bad. We can mix it with anything you like."
 - Don't hide medications in food/drinks.
 - NEVER tell children pills are candy.
- Be firm and give a reason
 - "You have to take it or you won't get well."
 - "This medication is important because it..."
 - Do not waiver on missing doses, the more structured and consistent administrations are the more your child will earn and value their importance.
- Don't attack self-esteem or criticize your child
 - Talk about specific difficulties and work together to find solutions.
- Don't punish with spanking or yelling
 - NEVER physically force a child to take their medications.
- Praise and hug your child for all cooperation
 - Provide a sense of control when possible.

PUBLIC HEALTH TRENDS IN CHILDREN & ADOLESCENTS

IMMUNIZATIONS

- Recommended schedule per CDC; changes yearly
- Contraindications
 - Life-threatening reaction to previous dose
 - Moderate to severe acute illness
 - For live vaccines (MMRV, Nasal Influenza, Rotavirus): immune suppression
 - Influenza
 - Severe egg allergy
 - Child <2 years of age and/or <5 years of age with asthma or wheezing in the past year
 - MMR
 - History of life-threatening allergic reaction to gelatin or neomycin
 - Severe immunosuppression not associated with HIV
- Administration: Intramuscular
 - Vastus lateralis: MUST use in infants <7 months
 - Deltoid: 18 months+ if sufficient muscle mass
 - MMR: 2 doses at ~12-15 months and 4-6 years and should not be given prior to 12 months due to maternal antibodies





IMMUNIZATIONS

- Adverse Reaction
 - Difficulty breathing
 - Hoarseness or wheezing
 - Hives
 - Pallor
 - Lethargy
 - Dizziness
 - Tachycardia
- Side Effects
 - Mild: Fever or soreness at the injection site This is expected and OK.
 - Live: Typically occur 2-4 weeks after administration and mimic the actual disease they are designed to protect against
 - Varicella
 - Rotavirus
- Notification of Health Care Provider
 - Signs of a severe adverse reaction
 - High fever
 - Behavioral changes
 - Any concerns



DENTAL HEALTH Dental Caries: "Baby Bottle Tooth Decay"

- Demineralization of the tooth surface, secondary to production of organic acids by bacterial fermentation of dietary carbohydrates
- Dependent on
 - Frequency of acid environment in mouth
 - Availability of fluoride for remineralization
 - Oral hygiene
- Mutans streptococci
- Opaque white spots → turn light brown → progressing to dark brown with destruction of the tooth
- Prevention
 - Don't put to nap or sleep with bottle or breast
 - Low sugar and complex carbohydrate consumption
 - Daily brushing
 - *Fluoride* Toothpaste, supplementation, or sealant
 - Dental visit by 1st birthday
 - Maternal dental health







SUICIDE

- YOUTH Rates are continuing to rise, despite decades of prevention efforts
- Suicide is the second leading cause of death for young people 10 to 24 years of age in the United States and worldwide.
- More young people died by suicide than the top 17 leading medical causes of death combined.
- "Although underrepresented in current research, preteens and younger children think about, plan, and die by suicide. Among children 5 to 12 years of age, suicide is the fifth leading cause of death. Notably, suicide rates in youth 10 to 14 years of age are the fastest growing, with rates of suicide now exceeding death by traffic accident."

SUICIDE PREVENTION STRATEGIES

- Primary:
 - Fostering resilience in young patients
 - Promoting peer and family connectedness
 - Intervening on parent psychopathology
- Secondary:
 - Identifying youth at risk for suicide
 - Recognize warning signs



Sentinel Event Alert 56: Detecting and treating suicide ideation in all settings

SUICIDE SCREENING: ASQ: "ASK SUICIDE-SCREENING QUESTIONS"

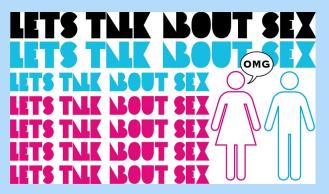
		TOOLKI
Suicide Risk Scree	ning To	ol
Ask Suicide-Screening Questions		
Ask the patient: ————————————————————————————————————		
. In the past few weeks, have you wished you were dead?	○ Yes	ONo
. In the past few weeks, have you felt that you or your family	0	
would be better off if you were dead?	○ Yes	ONG
In the past week, have you been having thoughts about killing yourself?	O Yes	O No
	9 163	
. Have you ever tried to kill yourself?	○ Yes	O No
If yes, how?		
When?		
f the patient answers Yes to any of the above, ask the following ac	uity auestion:	
		O Na
i. Are you having thoughts of killing yourself right now?	○ Yes	O No

ADOLESCENT RISKY BEHAVIORS

- Sexual Health
 - Promote responsible sexual behaviors
 - Implications of sexual intercourse (Pregnancy, STIs)
 - Breast and testicular self-exams
- Substance Use (Alcohol, Tobacco, Prescription and Illicit Drugs)
 - Healthy People 2010: Reduce teen substance use
- Gang Activity
 - Promote a healthy environment (home, school, community) for all children
 - Screen for violence
 - Referral to appropriate specialist or treatment should occur



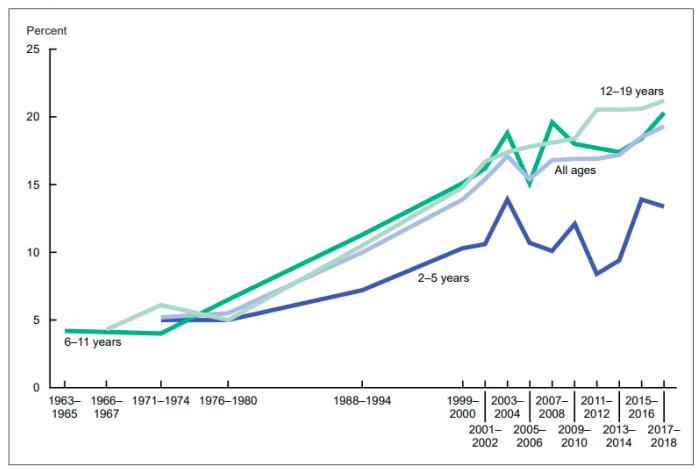




OBESITY

- Overweight vs Obesity
- 2017-2018 NHANES, 2-19 year olds:
 - 16.1% are overweight
 - 19.3% of 2-19 years olds with obesity
 - Including 6.1% with severe obesity
- Causes
- Consequences

Figure. Trends in obesity among children and adolescents aged 2–19 years, by age: United States, 1963–1965 through 2017–2018



NOTE: Obesity is body mass index (BMI) at or above the 95th percentile from the sex-specific BMI-for-age 2000 CDC Growth Charts.

SOURCES: National Center for Health Statistics, National Health Examination Surveys II (ages 6–11), III (ages 12–17); and National Health and Nutrition Examination Surveys (NHANES) I–III, and NHANES 1999–2000, 2001–2002, 2003–2004, 2005–2006, 2007–2008, 2009–2010, 2011–2012, 2013–2014, 2015–2016, and 2017–2018.

HEALTHY EATING

- Allowing the child to feed self promotes and reinforces self-regulation of intake
- Peers, others outside the family, and the media greatly influence food choices of children
- At least 3 family mealtimes are recommended per week; benefits include:
 - Reduction in the odds for overweight (12%), eating unhealthy foods (20%), and disordered eating (35%)
 - An increase in the odds for eating healthy foods (24%)





PHYSICAL ACTIVITY & EXERCISE

Guidelines and objectives through: 2008 Physical Activity Guidelines for Americans, Healthy People 2020, and the American Academy of **Pediatrics**

- GOAL: 60 minutes of moderate to vigorous physical activity DAILY (does not have to be continuous)
- Activities should include:
 - Aerobic activity for cardiovascular and respiratory fitness
 - Resistance activities for muscular strength
 - Weight loading for bone strength
 - "Should be enjoyable to the child/adolescent and developmentally appropriate" ©

















CONCLUSION

TAKE AWAY'S

- Introduce yourself and explain your role
- For young children, always proceed from least invasive to most invasive during the assessment
- Keep _____ updated on plan and provide support as needed
- Offer choices if there are options
- Don't make promises you can't keep
- Do not leave medications at _____
- Child-proof _____ as much as possible
- Clean up after yourself
- Reinforce hand-washing, infection control
- Make things fun!!!!

OBTAINING CONTACT HOURS

Next Steps:

- ☐ Complete the activity
- Complete the evaluation at: www.cdc.gov/Get_CE
- ☐ Pass the post-test (accessible at www.cdc.gov/Get_CE) with a score of 75%

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The course access code is Nurses2021.

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