


26th Annual General Pediatric Review & Self-Assessment

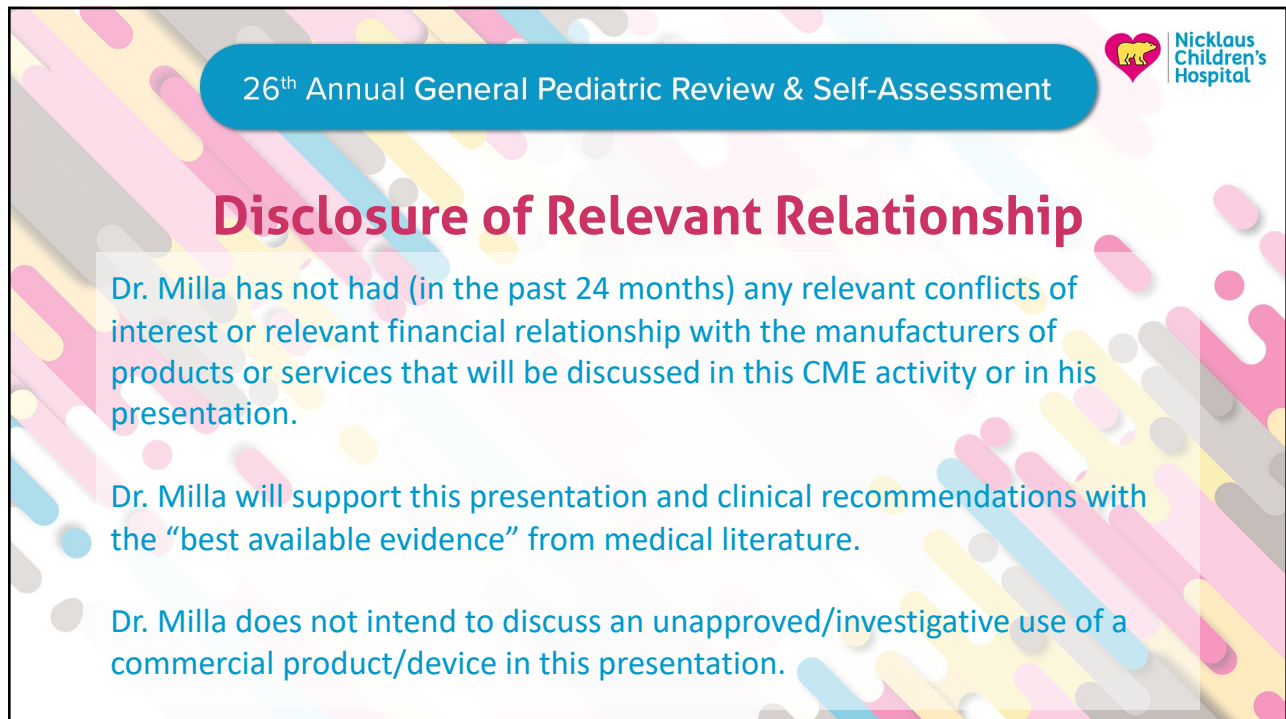


GENERAL PEDIATRICS


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26th Annual General Pediatric Review & Self-Assessment



Disclosure of Relevant Relationship

Dr. Milla has not had (in the past 24 months) any relevant conflicts of interest or relevant financial relationship with the manufacturers of products or services that will be discussed in this CME activity or in his presentation.

Dr. Milla will support this presentation and clinical recommendations with the “best available evidence” from medical literature.

Dr. Milla does not intend to discuss an unapproved/investigative use of a commercial product/device in this presentation.

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Overview

- ▶ Normal Growth and Physical Development
- ▶ Anticipatory Guidance/Health Supervision
- ▶ Common Screening Tests
- ▶ Immunizations
- ▶ Child Abuse
- ▶ Common Problems in General Pediatrics
- ▶ Ethics for Primary Care

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Growth and Physical Development

- ▶ Weight
 - ▶ Maximum weight loss in first 2 weeks: **10%**
 - ▶ Birth Weight regained within 10-14 days (2 weeks)
 - ▶ Doubles in 4 months
 - ▶ Triples at 12 months
 - ▶ Quadruples at 24 months
- ▶ On average, infants gain 110 to 200 gm (4-6 oz) per week in the first 4-6 months and 85 to 140 gm (3-5 oz) per week from ages 6-18 months

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Growth and Physical Development

- ▶ Weight at each visit
- ▶ Plot growth on appropriate curve
- ▶ Use the WHO growth charts to monitor growth from 0 to 2 years in the US
- ▶ Use the CDC growth charts to monitor growth for children age 2 years and older in the US
- ▶ Transition to BMI by age 2; weight for length under age 2

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Growth and Physical Development

- ▶ **Length/Height**
- ▶ Gain in 1st year: 50%
 - From birth to 6 months- grow approximately 2.5 cm (1inch) per month
 - From ages 6 to 12 months- grow approximately 1.25 cm (1/2 inch) per month
- ▶ Doubles at 4 years
- ▶ Triples by 13 years
- ▶ All patients should have a length/height measurement
 - Length- measure in the recumbent position until age 2
 - Standing Height- after age 2
- ▶ Plot on growth curve

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Mid-Parental Height

Formulae for Calculating Mid-Parental Height

Gender	Formula
Girls	$[\text{Paternal height (cm)} - 13 \text{ cm} + \text{Maternal height (cm)}] \div 2$ or $[\text{Paternal height (in)} - 5 \text{ in} + \text{Maternal height (in)}] \div 2$
Boys	$[\text{Paternal height (cm)} + 13 \text{ cm} + \text{Maternal height (cm)}] \div 2$ or $[\text{Paternal height (in)} + 5 \text{ in} + \text{Maternal height (in)}] \div 2$

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Growth and Physical Development

- ▶ **Head Circumference (HC)**
 - ▶ Measure through age 3 (period of maximal brain growth)
 - ▶ Technique- use a measuring tape that cannot be stretched
 - ▶ Securely wrap the tape around the widest possible circumference of the head
 - ▶ Record the greatest of 3 measurements of occipital-frontal circumference

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Growth and Physical Development

▶ Head Circumference

- ▶ **Microcephaly**- head circumference <2 standard deviations (3rd percentile) below the mean, based on age and sex
 - ▶ Associated conditions- Trisomies, Miller Dieker syndrome, Cornelia de Lange, Seckel syndrome, Rubenstein Taybi syndrome
- ▶ **Macrocephaly**- head circumference >2 standard deviations (97th percentile) above the mean, based on age and sex
 - ▶ Associated conditions- Autism, Fragile X, metabolic conditions

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Growth and Development

▶ Failure to Thrive

- ▶ Decelerated or arrested physical growth (height and weight below 5th percentile or downward change in growth across two major growth percentiles).
- ▶ Associated with abnormal growth and development
- ▶ **Inadequate nutrition is the cause of failure to thrive**
- ▶ The causes and effects of malnutrition are usually intertwined
- ▶ **Organic FTT**- has a medical disorder known to interfere with growth, including malabsorptive diseases, genetic syndromes, endocrine disorders, and neurologic dysfunction
- ▶ **Nonorganic FTT**- a diagnosis of exclusion to describe the child who has grown poorly and has no identified medical condition
- ▶ May be an expression of parental neglect/inadequacy

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Growth and Development

- ▶ Dietary associations with poor growth in young children
 - ▶ Breastfeeding difficulties
 - ▶ Improper formula mixing
 - ▶ Poor transition to food (6 to 12 months of age)
 - ▶ Excessive juice consumption
 - ▶ Avoidance of high-calorie foods

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Question 1

How soon does an infant regain birth weight?

- A. 10 to 14 days
- B. 4 to 7 days
- C. 3 to 4 days
- D. An infant should not lose weight after birth

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Question 1

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Anticipatory Guidance/Health
Supervision

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Question 2

- ▶ When should the pediatrician provide health supervision or counseling?

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Question 2

- ▶ When should the pediatrician provide health supervision or counseling?
 - ▶ AT EVERY VISIT

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Anticipatory Guidance

- ▶ Car Safety
- ▶ Accidents are the leading cause of death through adolescence
- ▶ Motor vehicle collisions are the leading cause of death and disability in children in America
- ▶ The use of a child restraint system (CRS) reduces fatal injury by 71% in infants and 54% in children ages 1 to 4 years
- ▶ Booster seats reduce the risk of injury by 59% in children ages 4 to 7 years
- ▶ Preterm infants (<37 weeks gestational age) and infants who have a h/o respiratory issues should be observed and monitored for apnea, bradycardia, or oxygen desaturation when placed in a CRS before discharge
- ▶ No straightforward recommendations if an infant fails this “car seat challenge”
- ▶ Options have included delaying hospital discharge, modifying the seat and retesting, using “car beds”, or prescribing stimulant medications for babies who have apnea

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Types of Car Seats

Age Group	Type of Seat	General Guidelines
Infants & toddlers	<ul style="list-style-type: none"> • Rear-facing-only • Rear-facing convertible 	All infants and toddlers should ride in a rear-facing seat until they reach the highest weight or height allowed by the car seat’s manufacturer. Most convertible seats have limits that will permit children to ride rear-facing for 2 years or more.
Toddlers & preschoolers	<ul style="list-style-type: none"> • Convertible • Forward-facing with harness 	Children who have outgrown the rear-facing weight or height limit for their convertible seat should use a forward-facing seat with a harness for as long as possible, up to the highest weight or height allowed by their car safety seat manufacturer.
School-aged children	<ul style="list-style-type: none"> • Booster seats 	All children whose weight or height exceeds the forward-facing limit for their car safety seat should use a belt-positioning booster seat until the vehicle seat belt fits properly, typically when they have reached 4 feet 9 inches in height and are 8 through 12 years of age. All children younger than 13 should ride in the back seat.
Older children	<ul style="list-style-type: none"> • Seat belts 	When children are old enough and large enough for the vehicle seat belt to fit them correctly, they should always use lap and shoulder seat belts for the best protection. All children younger than 13 years should ride in the back seat.

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Question

- ▶ During a well child visit, you are counseling the parents of a 9 month old child about the positioning and type of car seat that they should be using. The child weighs 25 lb. You advise the parents to use:
- ▶ A. a rear-facing infant car seat
- ▶ B. a forward-facing infant car seat
- ▶ C. a rear-facing convertible car seat
- ▶ D. a forward-facing convertible car seat
- ▶ E. both A and C are correct

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Question

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- ▶ D. a forward-facing convertible car seat
- ▶ E. both A and C are correct

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Anticipatory Guidance

▶ Screen Time

- ▶ The AAP recommends that children older than 2 limit television and video viewing to no more than 1 hour of quality programming per day
- ▶ Use of TV, computer, tablet, and smartphone is discouraged
- ▶ There is a dose-response relationship between hours of TV viewing and obesity in children
- ▶ Violent media exposure has been associated with increased fear and anxiety in children
- ▶ Ban devices and tvs an hour before bed and in bedrooms overnight. Associated with poor sleep hygiene
- ▶ Designate media-free places and times (such as dinner time) for all family members, including adults
- ▶ Continue to monitor what kids watch and talk to them about online bullying, sexting and other hazards

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Anticipatory Guidance

▶ Injury Prevention Topics

- ▶ Head Injury Prevention
- ▶ Bicycle Safety
- ▶ Water Safety
- ▶ Sun exposure
- ▶ Firearms
- ▶ Smoke detectors
- ▶ Hot water heater temp (120 F)
- ▶ Animal bites
- ▶ Storage of toxic substances
- ▶ Choking hazards

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Anticipatory Guidance

- ▶ Injury Prevention Topics (continued)
- ▶ Sports safety
- ▶ Alcohol and drug use
- ▶ Suicide prevention
- ▶ Homicide prevention
- ▶ Drowning prevention

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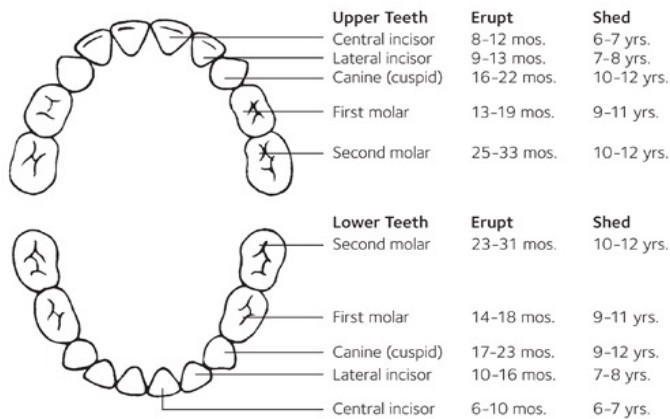
Dental

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Primary Teeth

- ▶ Development begins between 4 and 15 months of age
- ▶ 20 primary teeth (usually by age 3 years)
- ▶ Symptoms
 - ▶ Drooling
 - ▶ Disturbed sleep
 - ▶ Irritability
 - ▶ Swollen gums

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Upper Teeth		Erupt	Shed
Central incisor		8-12 mos.	6-7 yrs.
Lateral incisor		9-13 mos.	7-8 yrs.
Canine (cuspid)		16-22 mos.	10-12 yrs.
First molar		13-19 mos.	9-11 yrs.
Second molar		25-33 mos.	10-12 yrs.
Lower Teeth		Erupt	Shed
Second molar		23-31 mos.	10-12 yrs.
First molar		14-18 mos.	9-11 yrs.
Canine (cuspid)		17-23 mos.	9-12 yrs.
Lateral incisor		10-16 mos.	7-8 yrs.
Central incisor		6-10 mos.	6-7 yrs.

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Dental Issues

- ▶ Delayed Tooth Eruption
 - ▶ Impacted teeth
 - ▶ Radiation therapy
 - ▶ Craniofacial anomalies
 - ▶ Congenital hypopituitarism
 - ▶ Congenital hypothyroidism
 - ▶ Genetic disorders
 - ▶ Trisomy 21
 - ▶ If no teeth within 6 months of target- see Dentist

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Dental Guidance

- ▶ Early childhood caries is the number one chronic infectious disease of early childhood
- ▶ Good oral health starts early
- ▶ Children should receive preventive oral healthcare from a dentist or pediatrician by 1 year of age or 6 months (if high risk)
- ▶ Children should be exposed to adequate levels of fluoride
 - ▶ Water
 - ▶ Toothpaste
 - ▶ Other sources

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Dental Guidance

- ▶ Children at high risk should receive fluoride varnish from their dentist or pediatrician if dentist is not available
 - ▶ Moderate risk- every 6 months
 - ▶ High risk every 3-4 months
- ▶ No bottles to bed
- ▶ Introduce a cup as soon as an infant can sit unsupported (6 months). Eliminate the bottle by 1 year of age
- ▶ Feed children healthy foods that are low in sugar
- ▶ Bacteria can be transmitted from a Mother to a child by sharing utensils, cleaning pacifiers with the mouth, and pre-chewing food

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Children at High Risk for Early Tooth Decay
• Children on Medicaid
• Children whose mother or primary caregiver has cavities
• Children with siblings who have cavities
• Premature or low birth weight children
• Children with special health care needs
• Children who use a bottle after 15 months of age or have sweets and starchy snacks more than 3 times a day

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Common Screening Tests

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Screenings

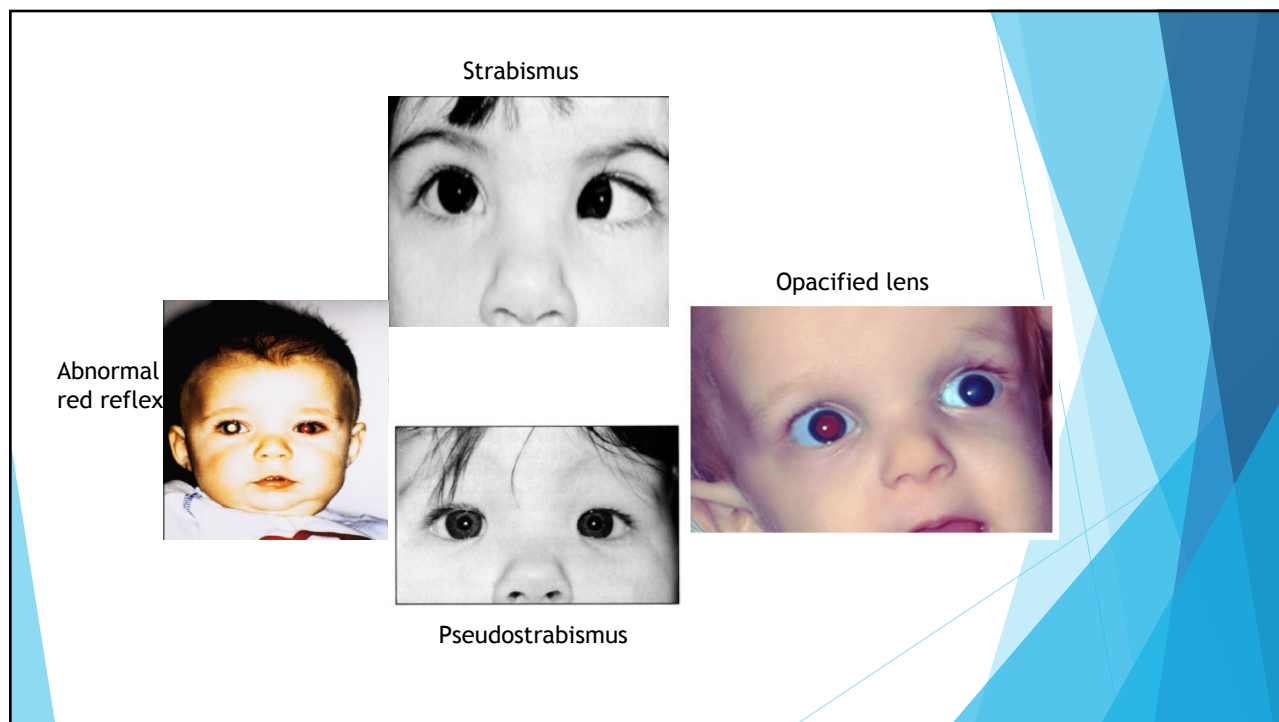
- ▶ Vision
- ▶ Hearing
- ▶ Iron Deficiency
- ▶ Lead
- ▶ Blood Pressure
- ▶ Hypercholesterolemia
- ▶ Autism
- ▶ Newborn Metabolic Screen
- ▶ BMI

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Screening

- ▶ Vision
- ▶ Visual Assessments/Eye Exam
 - Birth
 - All Well Child Visits
- ▶ Visual Acuity (Snellen Chart)
 - Visual Acuity in healthy newborns is ~ 20/400
 - Earliest possible age to test is 3 years old
- ▶ Cover/Uncover Test to look for misalignment (strabismus)

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Screening

- ▶ **Hearing Screening**
- ▶ Hearing loss is divided into conductive, sensorineural, mixed, and central types
- ▶ Conductive hearing loss (CHL)- **more common** in children
Results from interference with the mechanical transmission of sound through the external and middle ear
Most common cause of CHL- Otitis Media with Effusion
- ▶ Sensorineural hearing loss (SNHL)
Results from failure to transduce vibrations to neural impulses effectively within the cochlea or transmit these impulses down the vestibular nerve
- ▶ Mixed hearing loss
Involves a combination of these two types, usually due to damage throughout the middle ear and the inner ear
- ▶ Central hearing loss- results from defects in the brainstem or higher processing centers of the brain
- ▶ Both CHL and SNHL may be caused by a wide variety of congenital and acquired factors

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Conductive Hearing Loss	Sensorineural Hearing Loss
<u>Congenital</u>	
Microtia/atresia	Genetic disorders (syndromic, connexin 26, mitochondrial)
Tympanic membrane abnormalities	In utero infections (cytomegalovirus, measles, mumps, rubella, varicella, syphilis)
Ossicular malformations	Anatomic abnormalities of the cochlea or temporal bone
	Exposure to ototoxic drugs during pregnancy (alcohol, isotretinoin, cisplatinum)
	Hyperbilirubinemia
<u>Acquired</u>	
Infection (acute otitis media, otitis externa, ossicular erosion)	Infections (bacterial meningitis, measles, mumps, rubella, Lyme disease)
Otitis media with effusion	Trauma (physical or acoustic)
Foreign body (including cerumen)	Radiation therapy for head and neck tumors
Cholesteatoma	Neurodegenerative or demyelinating disorders (Alport, Cogan syndromes)
Trauma (ossicular disruption, tympanic membrane perforation)	

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Screenings

▶ Hearing Screening

- ▶ AAP recommends Universal Newborn Hearing Screen (UNHS) for all newborns before 1 month of age. Abnormal UNHS should be confirmed by 3 months of age
- ▶ Goal: 100% screened by age 3 months
- ▶ 1-3/1000 children are born deaf
- ▶ Otoacoustic Emissions (OAE) measures sound waves produced in the inner ear via a probe placed in the ear canal
- ▶ Brainstem evoked response audiometry involves electroencephalographic response to auditory stimulus
- ▶ Early hearing loss detections and intervention can lead to better vocabulary and intellectual development

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Screenings

▶ Iron Deficiency

- ▶ Screen all infants (routine hemoglobin test) by 12 months of age
- ▶ High Risk
 - Prematurity
 - Low birth weight
 - Cow's milk before 1 year of age
 - Menstruating females
- ▶ Ages 3-10 years- Screen if child is high risk
- ▶ Adolescence-targeted screening based on history. Menstruating females at high risk

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Screenings

- ▶ Lead
- ▶ CDC recommends screening between 6 months- 6 years
- ▶ Minimum at 1 and again at 2 years of age
- ▶ Peak occurs at 2 years
- ▶ Venous is preferred over capillary (fingerstick)
- ▶ Threshold for intervention continues to drop (any lead level can be harmful)
- ▶ Currently the threshold for intervention is 3.5 mcg/dl

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Screenings

- ▶ Blood Pressure (BP)
- ▶ Annually after 3 years of age
- ▶ Before age 3 years, BP should be obtained if risk is present (renal or cardiovascular condition)
- ▶ Hypertension (HTN) is defined as 3 separate readings over a period of at least several days
- ▶ High normal BP (90-95% based on height percentile and age)
- ▶ HTN is a blood pressure over 95%

AAP 2017 for Children 1-13 y		AAP 2017 for Children ≥13 y	
Classification	SBP/DBP Percentile	Classification	Absolute Threshold
Normal	<90th	Normal	<120/<80mmHg
Elevated BP	≥90th to <95th Or 120/80 mm Hg to <95th (whichever is lower)	Elevated BP	120/<80 to 129/<80 mm Hg
Stage 1 hypertension	≥95th to <95th Plus 12 mm Hg or 130/80-139/89 mm Hg (whichever is lower)	Stage 1 hypertension	130/80 to 139/89 mm Hg
Stage 2 hypertension	≥95th Plus 12 mm Hg or ≥140/90 mm Hg (whichever is lower)	Stage 2 hypertension	≥140/≥90mmHg

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Screenings

- ▶ Newborn Metabolic Screen
 - ▶ State-dependent
 - ▶ Timing- not before 24 hours of life (not enough metabolite built up in order for test to pick it up)

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Screenings

- ▶ Autism Screening
 - ▶ Ages 18 and 24 months
 - ▶ Early recognition is important
 - ▶ Areas of concern
 - ▶ Social interaction (poor eye contact, resists physical contact, prefers to play alone)
 - ▶ Language (not talking, loses previous skill)
 - ▶ Behavior (repetitive movements, rituals, sensitivity to sound)

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Cholesterol and Lipid Screening

- ▶ AAP recommends nonfasting screening for dyslipidemia between 9 and 11 years of age and again between 17 and 21 years of age.
- ▶ Routine lipid screening is not recommended in children 2-8 and between 12 and 16 years of age.
- ▶ Overweight/obese children are treated primarily with weight management.
- ▶ Pharmacotherapy is generally not recommended in children <10 unless the following are present:
 - ▶ A high-risk CVD condition exists
 - ▶ LDL-C levels >400mg/dL (familial hypercholesterolemia)
 - ▶ TG>500mg/dL (familial hypertriglyceridemia)

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BMI Screening

- ▶ Most practical method to track overweight and obesity
- ▶ BMI assessment recommended yearly beginning at age two
 - ▶ BMI<5th percentile: underweight
 - ▶ BMI 5th to 84th percentile: healthy weight
 - ▶ BMI 85th to 95th percentile: overweight
 - ▶ BMI>95th percentile: obese

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Immunizations

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Immunizations

- ▶ Recommendations made by the Advisory Committee on Immunization Practices (ACIP)
- ▶ Latest schedule on CDC website- <http://cdc.gov/vaccines/recs/acip/>
- ▶ Pearl- If not given when recommended, give at first subsequent visit

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Immunizations

- ▶ Focus on:
- ▶ Immunization schedule
- ▶ Rationale for schedule
- ▶ Catch-up immunizations
- ▶ Immunization side effects
- ▶ Contraindications to immunization
- ▶ Types of vaccines (live vs inactivated)
- ▶ Timing when using other products (immunoglobulin, PPD, etc)

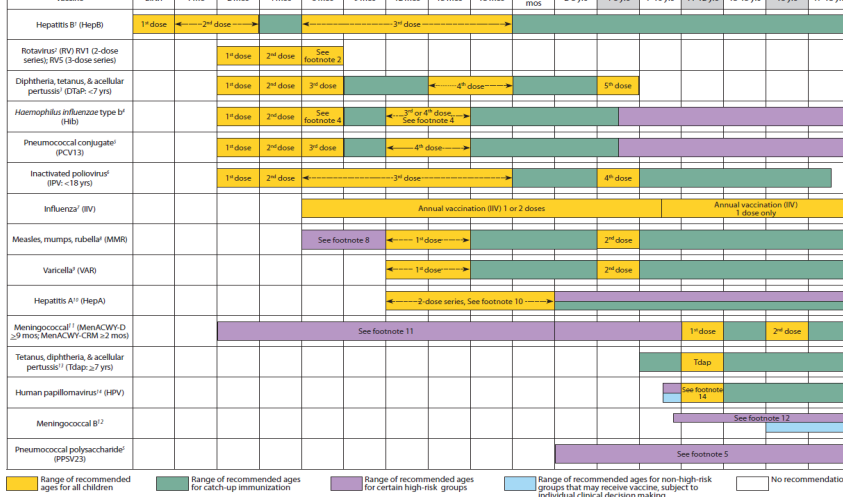
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Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2018.

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE (FIGURE 2)).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1.

To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded in gray.



NOTE: The above recommendations must be read along with the footnotes of this schedule.

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The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with Figure 1 and the footnotes that follow.

Persons aged 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to dose 2	Dose 2 to dose 3	Dose 3 to dose 4	Dose 4 to dose 5
Hepatitis B ¹	Birth	4 weeks	8 weeks and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus ²	6 weeks	4 weeks	4 weeks		
Diphtheria, tetanus, & acellular pertussis ³	6 weeks	4 weeks	4 weeks	6 months	6 months ⁴
Haemophilus influenzae type b ⁵	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose) if first dose administered at age 12 through 14 months No further doses needed if first dose administered at age 15 months or older	4 weeks ⁶ if current age is younger than 12 months and first dose administered at < 7 months old 8 weeks and age 12 months through 60 months (as final dose) ⁷ if current age is younger than 12 months and first dose administered between 7 through 11 months (regardless of Hib vaccine [PRP-T or PRP-CRM] used for first dose). OR If current age is 12 through 60 months and first dose administered at younger than age 12 months. OR If first 2 doses were PRP-CRM ⁸ and administered at younger than 12 months. No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 through 59 months who received 3 (PRP-T) doses before age 12 months and started the primary series before age 7 months.	
Pneumococcal ⁹	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus ¹⁰	6 weeks	4 weeks ¹¹	4 weeks ¹²	6 months ¹³ minimum age 4 years for final dose	
Meningococcal ¹⁴	6 weeks	8 weeks ¹⁵	See footnote 13	See footnote 13	
Measles, mumps, rubella ¹⁶	12 months	4 weeks			
Varicella ¹⁷	12 months	3 months			
Hepatitis A ¹⁸	12 months	6 months			
Persons aged 7 through 18 years					
Tetanus, diphtheria, tetanus, diphtheria, & acellular pertussis ¹⁹	7 years ⁴	4 weeks	4 weeks if first dose of DTaP/DT administered at younger than age 12 months 6 months if first dose of DTaP/DT administered at age 12 months or older and then no further doses needed for catch-up	6 months if first dose of DTaP/DT administered at younger than age 12 months	
Human papillomavirus ²⁰	9 years		Routine dosing intervals are recommended ¹²		
Hepatitis A ¹⁸	12 months	6 months			
Hepatitis B ¹	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated poliovirus ¹⁰	6 weeks	4 weeks	4 weeks ¹²	6 months ¹³	
Meningococcal ¹⁴	6 weeks	8 weeks ¹⁵			
Measles, mumps, rubella ¹⁶	12 months	4 weeks			
Varicella ¹⁷	12 months	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			

NOTE: The above recommendations must be read along with the footnotes of this schedule.

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Question

Which of the following vaccines are live?

- A. HBV
- B. IPV
- C. DTaP
- D. Hib
- E. PCV
- F. Rota

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Question

Which of the following vaccines are live?

- A. HBV
- B. IPV
- C. DTaP
- D. Hib
- E. PCV
- F. Rota

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Immunization

- ▶ 3 live vaccines
 - MMR
 - Varicella
 - Rota
- ▶ Other live vaccines only given to travelers
 - Oral Typhoid
 - Yellow Fever
- ▶ Rota is the only live vaccine given before 1 year of age

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Rotavirus

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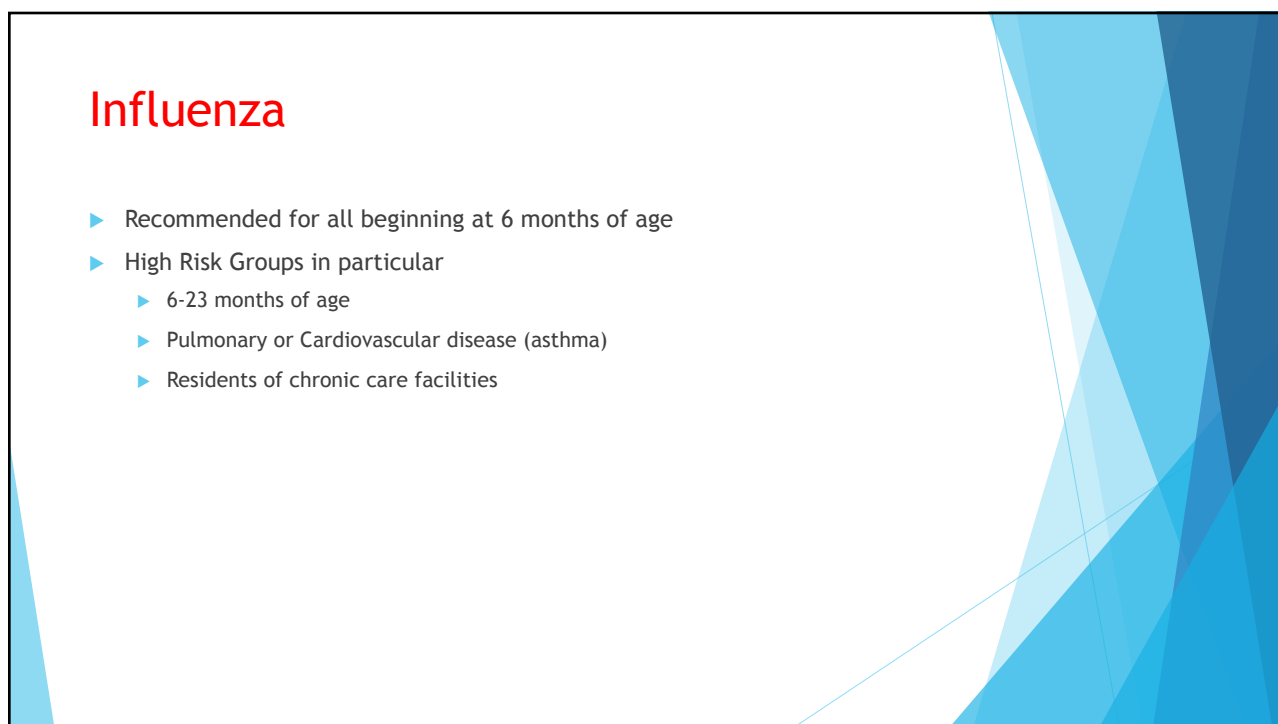
Rotavirus

- ▶ Most common cause of gastroenteritis in infants and young children
- ▶ A lot of morbidity associated with it
- ▶ Vaccine: Live, Oral
- ▶ RotaTeq: 2, 4, 6 mo
- ▶ Rotarix: 2, 4 mo
- ▶ Minimum age for first dose: 6 weeks
- ▶ Minimum interval: 4 weeks
- ▶ Maximum interval: 10 weeks
- ▶ Vaccine should be initiated by 15 weeks of life and not after
- ▶ Vaccine should not be continued in infants older than 8 months

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Influenza

- ▶ Give annually (beginning at 6 months)
- ▶ 2 doses (separated by 4 weeks) given to those receiving the vaccine for the first time (under 9 years old)
- ▶ Subsequent season: 1 dose

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Influenza

- ▶ Contraindications
 - ▶ Egg allergy **does not** impart an increased risk of anaphylaxis
 - ▶ Severe reaction to previous vaccine
 - ▶ Guillain-Barre (within 6 weeks of getting the flu vaccine)

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Measles-Mumps-Rubella (MMR)

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MMR

- ▶ Measles-Mumps-Rubella (MMR)
- ▶ Live attenuated vaccine
- ▶ 2 dose series given at 12-15 months and at 4-6 years
- ▶ Catch-up: 2 doses at least 4 weeks apart
- ▶ If given at <12 months old, needs to be repeated due to lack of immunogenicity
- ▶ Can be given as early as 6 months, but must be revaccinated at 12 months of age
- ▶ During an outbreak, MMR given within 72 hours of exposure to measles may provide some protection and is preferred to immune globulin

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MMR

- ▶ Contraindications
 - ▶ Pregnant women
 - ▶ Previous anaphylactic reaction to measles vaccine
 - ▶ Persons with severe immunocompromising conditions
 - ▶ Can be given to children with egg allergy (risk of anaphylaxis is low)

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Hepatitis B

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Hepatitis B

- ▶ Recombinant DNA-produced HBsAg Vaccine
- ▶ First dose in nursery before discharge
- ▶ 3 doses
- ▶ 4th dose allowed if using combination vaccines
- ▶ If mother HBsAg+
 - ▶ HBV and Hep B immune globulin within 12 hours of birth
 - ▶ If maternal status is unknown, should receive at birth and HBIG within 7 days if mom then found to be positive

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Question

The following are all acceptable regimens for Hepatitis B vaccine EXCEPT:

- A. Birth, 2 months, 4 months
- B. Birth, 1 month, 6 months
- C. 2 months, 4 months, 6 months
- D. 2 months, 4 months, 1 year
- E. 1 year, 2 years, 5 years

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Question

The following are all acceptable regimens for Hepatitis B vaccine **EXCEPT:**

- A. **Birth, 2 months, 4 months**
- B. Birth, 1 month, 6 months
- C. 2 months, 4 months, 6 months
- D. 2 months, 4 months, 1 year
- E. 1 year, 2 years, 5 years

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Question

An infant born to a mother whose HBsAg status at birth is unknown should receive:

- A. A first dose of Hep B vaccine sometime within the 1st 12 months of life.
- B. Hep B vaccine within 12 hrs of birth; the infant should then also be given HBIG within 7 days if mother found to be HBsAg positive.
- C. HBIG and first dose of Hep B vaccine between 3 and 6 months of life.
- D. Hep B vaccine and HBIG within the 1st 12 hours of life.

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Question

- ▶ An infant born to a mother whose HBsAg status at birth is unknown should receive:
 - A. A first dose of Hep B vaccine sometime within the 1st 12 months of life.
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 - C. HBIG and first dose of Hep B vaccine between 3 and 6 months of life.
 - D. Hep B vaccine and HBIG within the 1st 12 hours of life.

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Pneumococcal Vaccine

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Pneumococcal Vaccine

- ▶ Pneumococcal Vaccines
 - ▶ PCV13- 13-valent conjugate vaccine
 - ▶ Developed to prevent invasive pneumococcal disease in children <2 years
 - ▶ Prevention of pneumococcal pneumonia and meningitis, less effective in prevention of otitis media
 - ▶ Recommended for children **24 to 59 months if high risk**
 - ▶ Cochlear implant
 - ▶ Cardiac or pulmonary disease
 - ▶ Immunocompromised
 - ▶ Sickle cell disease, asplenia, HIV, diabetes, cancer
 - ▶ Long term use of steroids
 - ▶ Schedule
 - ▶ 2,4,6 and 12-15 months of age

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Pneumococcal Vaccine

- ▶ PS23- 23 valent polysaccharide vaccine
 - ▶ Not immunogenic in children <2 years
 - ▶ Given to high risk children >2 years for broader coverage

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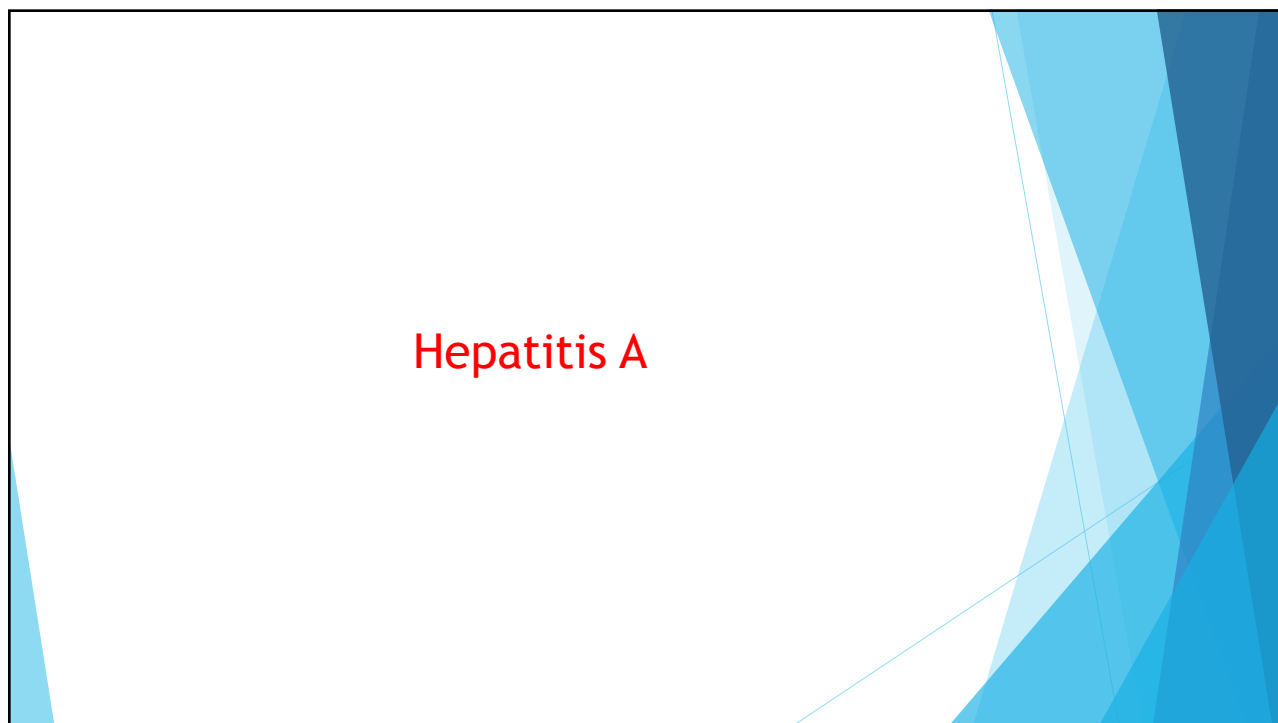
<p>High Risk¹ Age <24 months</p> <p>Sickle cell disease</p> <p>Asplenia (congenital or acquired) or splenic dysfunction (including other sickle hemoglobinopathies)</p> <p>Human immunodeficiency virus infection</p> <p>Cochlear implants (particularly those who received an implant with a positioner)</p> <p>Presumed High Risk² Congenital immune deficiency, including some B- (humoral) or T-lymphocyte deficiencies, complement deficiencies (particularly C1, C2, C3, and C4), and phagocytic disorders (with the exception of chronic granulomatous disease)</p> <p>Chronic cardiac disease (particularly cyanotic congenital heart disease and heart failure)</p> <p>Chronic pulmonary disease (including asthma treated with high-dose corticosteroid therapy)</p> <p>Cerebrospinal fluid leaks from a congenital malformation, skull fracture, or neurologic procedure</p> <p>Chronic renal insufficiency, including nephrotic syndrome</p> <p>Conditions associated with immunosuppressive therapy or radiation therapy (including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease) and solid organ transplantation</p> <p>Diabetes mellitus</p> <p>Moderate Risk³ All children 24 to 35 months of age</p> <p>Children 36 to 59 months of age attending out-of-home child care</p> <p>Children 36 to 59 months of age who are African American or of American Indian/Alaska Native descent</p>
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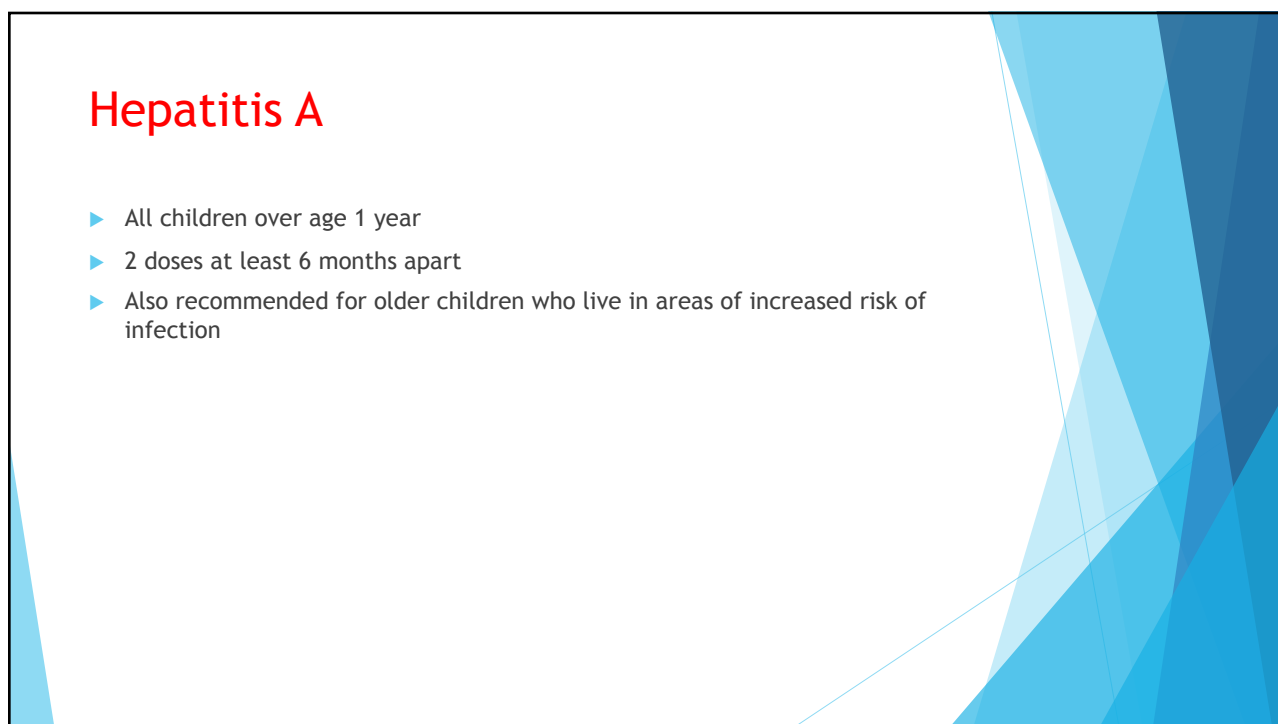
Haemophilus Influenzae Type B Vaccine

- ▶ Vaccine does not cover non-typeable Haemophilus
 - ▶ Otitis media
 - ▶ URI
- ▶ Hib Schedule
 - ▶ 2,4,6,12-15 months
 - ▶ Minimum age: 6 weeks
- ▶ Hib not recommended for those over 5 years except if they are high risk
 - ▶ Sickle cell
 - ▶ Leukemia
 - ▶ HIV
 - ▶ Splenectomy

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Meningococcal Vaccine

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Meningococcal Vaccine

- ▶ Two vaccines
 - ▶ Meningococcal conjugate vaccine (MCV)- protects against serogroups A,C,W, and Y
 - ▶ Meningococcal Serotype B (MenB)
- ▶ For patients not in high-risk group
 - ▶ Vaccinate at 11-12 year well visit with MCV
 - ▶ Booster of MCV at 16 years of age
 - ▶ MenB between 16-18 years old
- ▶ For high-risk patients
 - ▶ May vaccinate as early as 2 years of age. Revaccinate 3-5 years later if risk remains
 - ▶ High risk groups
 - ▶ Complement deficiency, anatomic or functional asplenia
 - ▶ Travelers to high-risk countries

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Varicella

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Question

The following are all true about the varicella vaccine EXCEPT:

- A. It is a live vaccine
- B. One dose is required
- C. It contains small amounts of neomycin and gelatin
- D. The vaccine can be given as early as 12 months
- E. 5% of recipients get a mild case of the chicken pox

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Question

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Varicella

- ▶ First dose: 12-15 months
- ▶ Second dose: 4-6 years
- ▶ 2 doses should be administered to all
 - ▶ Minimum interval for children 12 months to 12 years: 3 months
 - ▶ Minimum interval for Adolescents and Adults 13 and over: 4 weeks
- ▶ Vaccinate older kids if no history of disease
 - ▶ May check titers
- ▶ Vaccinate
 - ▶ Kids on low dose steroids (less than 2 mg/kg/day)
 - ▶ Children of pregnant women
- ▶ Do Not Vaccinate
 - ▶ Children on high-dose steroids
 - ▶ Pregnant women

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Varicella

- ▶ Varicella and MMR need to be given together.
- ▶ If not given together, need to wait 1 month.

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Polio

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Polio

- ▶ Use Inactivated Polio Vaccine
- ▶ Inactivated much less likely to cause disease compared to oral polio vaccine (OPV-no longer used in the US)
- ▶ Schedule
 - ▶ 2, 4, 6-18 mo and 4-6 years
 - ▶ 4th dose **MUST** be given after 4th birthday

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Human Papilloma Virus Vaccine (HPV)

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HPV

- ▶ Human Papilloma Virus is the most common cause of cervical cancer
- ▶ Two doses of the HPV vaccine are recommended for all boys and girls starting at age 9.
- ▶ If the vaccine is started on or after the age of 15, 3 doses are recommended (over a 6 month period)

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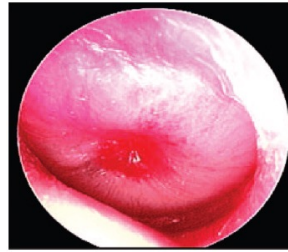
Common Pediatric Conditions

- ▶ Otitis Media
- ▶ Sinusitis
- ▶ Orbital/Periorbital Cellulitis
- ▶ Conjunctivitis
- ▶ Neck Masses
- ▶ Enuresis

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Otitis Media

- ▶ Risk factors for the development of AOM and/or OME
 - ▶ Less than 2 years of age
 - ▶ Atopy
 - ▶ Sinus disease
 - ▶ Ciliary dysfunction
 - ▶ Cleft palate/craniofacial abnormalities
 - ▶ First OM before 6 months of age
 - ▶ Immunocompromised



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Otitis Media

- ▶ Criteria for treatment
 - ▶ No bulging or MEE: No AOM
 - ▶ Severe symptoms- always treat
 - ▶ Mild symptoms
 - ▶ Less than 2 years of age
 - ▶ Unilateral disease- observe & follow-up in 48-72 hours
 - ▶ Bilateral disease-treat
 - ▶ Over 2 years of age
 - ▶ Observe & follow-up in 48-72 hours

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Otitis Media

- ▶ Treatment
 - ▶ First line
 - ▶ High dose Amoxicillin
 - ▶ If no Amoxicillin in the past 30 days
 - ▶ High dose Amox/Clavulanic Acid
 - ▶ If received Amoxicillin in past 30 days
 - ▶ Alternatives
 - ▶ Cefdinir, Cefuroxime, Cefpodoxime, Ceftriaxone
 - ▶ Treatment failure
 - ▶ High dose Amoxicillin/Clavulanic Acid, Ceftriaxone
 - ▶ Clindamycin +3rd generation Cephalosporin+ ENT and/or ID

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Otitis Media

- ▶ Chronic Suppurative Otitis Media
 - ▶ Pseudomonas, Staph
- ▶ Cholesteatoma
 - ▶ TM retraction pockets. Presents with hearing loss and otorrhea. Recurrence after resection
- ▶ Bullous myringitis
 - ▶ Blister in TM associated to AOM
- ▶ Mastoiditis
 - ▶ Strep Pneumo, S. Pyogenes, Staph aureus, and H.Influenzae. CT for diagnosis. Most common suppurative complication of AOM

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Sinusitis

- ▶ Anatomy
 - ▶ Ethmoids and maxillary sinus are developed in small children, sphenoids 3-5 years, frontal 6-10 years
- ▶ Symptoms criteria
 - ▶ URI with persistent illness for 10 days without improvement
 - ▶ URI worsening after initial improvement
 - ▶ Severe onset of symptoms: high fever, purulent nasal discharge > 3 days
- ▶ Pathogens
 - ▶ Strep pneum, M. catarrhalis, H. Influenzae, Strep pyogenes, Anaerobes

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Sinusitis

- ▶ Imaging studies
 - ▶ Contrast CT: seizures, severe headache, photophobia, eye swelling or pain with EOM, proptosis
- ▶ Treatment plan (10-28 days)
- ▶ Amoxicillin or Amoxicillin/Clavulanic Acid
- ▶ Alternatives: Ceftriaxone
 - ▶ Cefdinir, Cefuroxime if PCN allergy
 - ▶ Clindamycin, Linezolid, Cefixime for severe disease

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Preseptal vs Orbital Cellulitis

- ▶ It is important to distinguish preseptal/periorbital from orbital cellulitis
- ▶ Preseptal cellulitis is an infection of the eyelid (not involving the orbit)
- ▶ Only orbital cellulitis causes swelling and inflammation of the extraocular muscles leading to pain with eye movements, proptosis and in some cases opthalmoplegia with diplopia
- ▶ Both can have fever and leukocytosis, but more common in orbital cellulitis
- ▶ Orbital cellulitis is less common than preseptal cellulitis, but far more consequential and life threatening

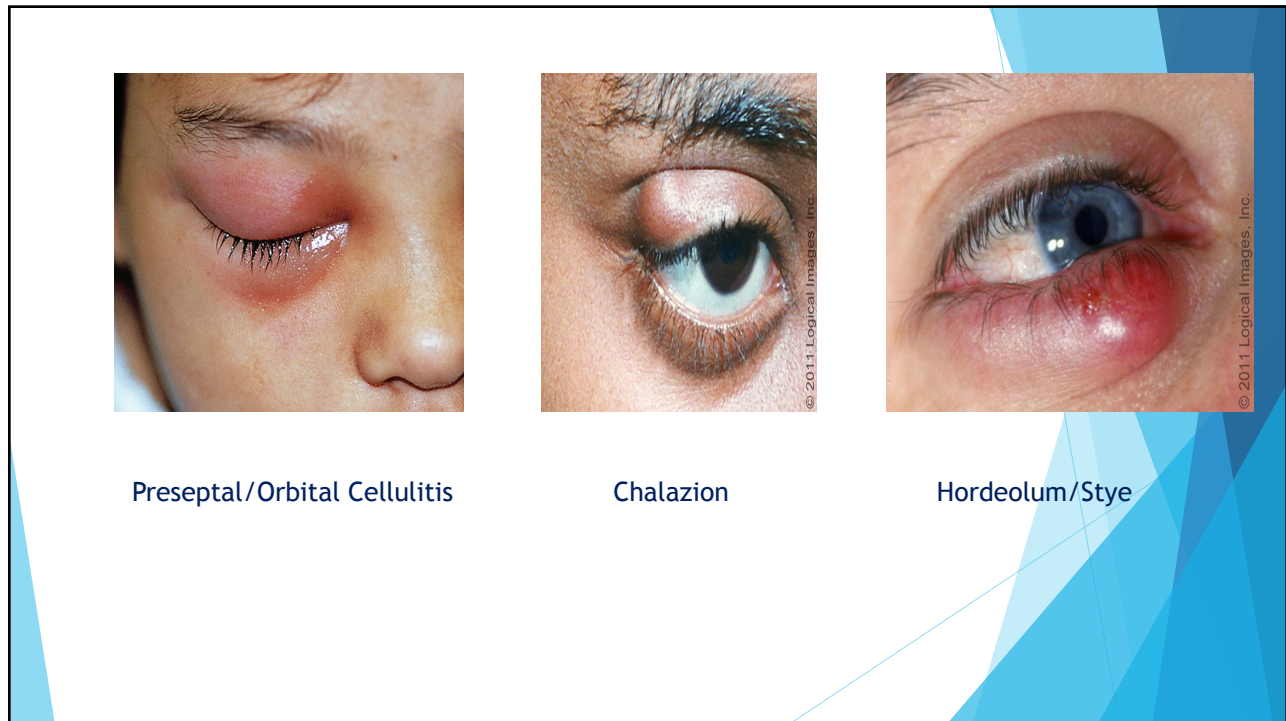
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Orbital vs Periorbital Cellulitis

Clinical features of preseptal and orbital cellulitis

Clinical feature	Preseptal cellulitis	Orbital cellulitis
Eyelid swelling with or without erythema	Yes	Yes
Eye pain/tenderness	May be present	Yes; may cause deep eye pain
Pain with eye movements	No	Yes
Proptosis	No	Usually, but may be subtle
Ophthalmoplegia +/- diplopia	No	May be present
Vision impairment	No	May be present*
Chemosis	Rarely present	May be present
Fever	May be present	Usually present
Leukocytosis	May be present	May be present

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Enuresis

- ▶ Primary nocturnal enuresis
 - ▶ Nocturnal wetting in a child that has never been dry longer than 6 months
 - ▶ Expected to be dry by age 6 years, resolves at a rate of 15%/year
 - ▶ Genetics, vasopressin secretion, sleep factors, abnormal bladder dynamics, psychosocial, maturational delay
- ▶ Secondary enuresis
 - ▶ New onset nighttime wetting after being dry for 6 months

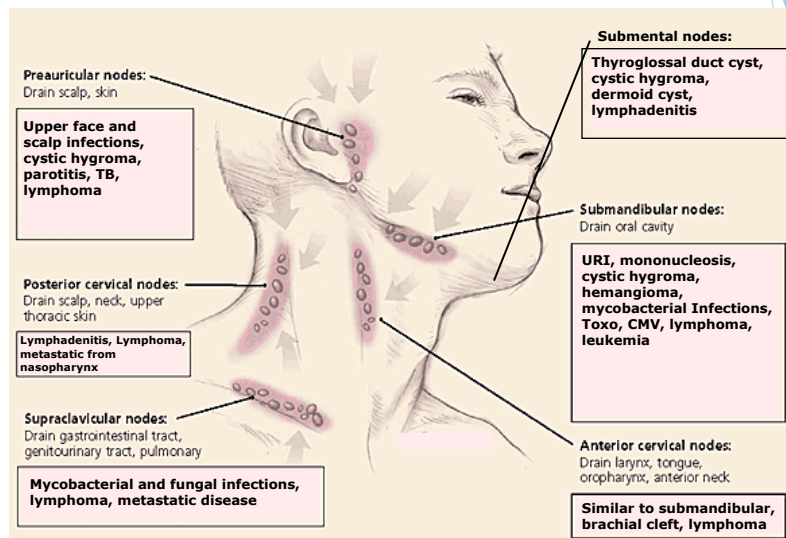
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Enuresis

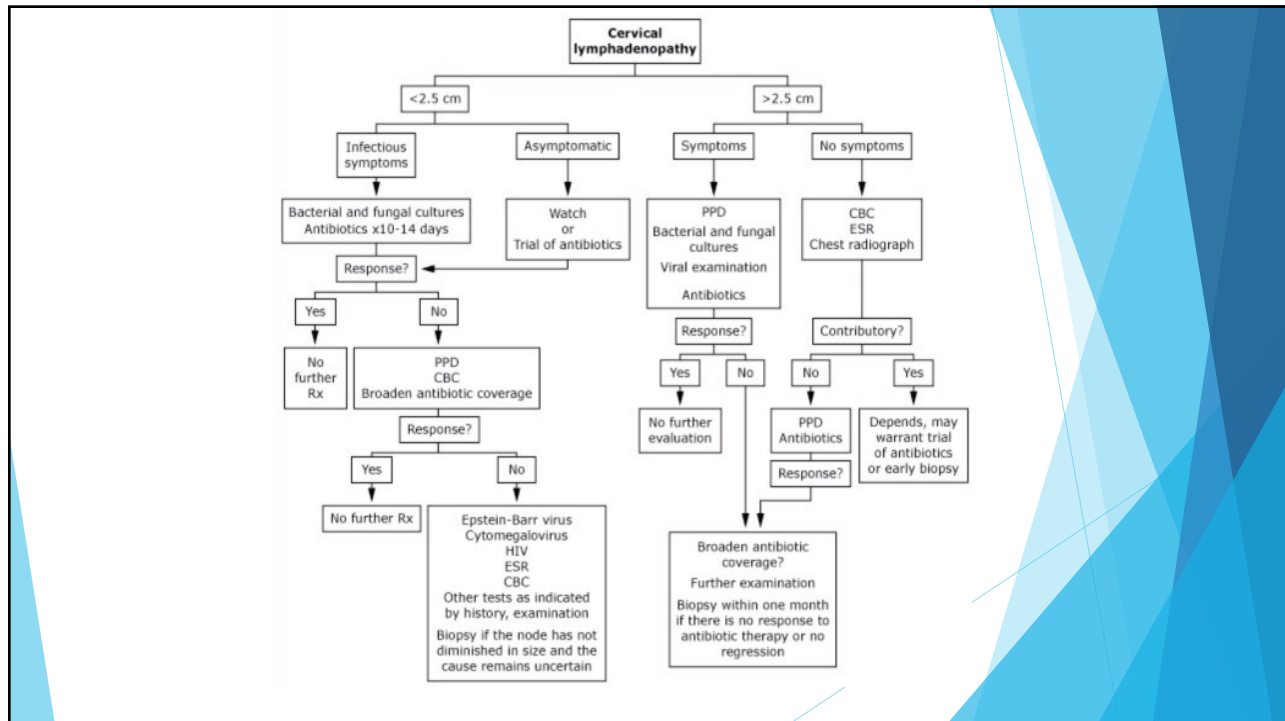
- ▶ Screening Urinalysis
- ▶ Treatment
 - ▶ Behavioral modification- limit fluid intake before bed
 - ▶ Alarm therapy- most successful
 - ▶ Medication-Desmopressin acetate, anticholinergics, imipramine
 - ▶ Acupuncture and hypnosis- little data to support

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Neck mass by location



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Conjunctivitis

Diagnosis	Pathogen	Presentation	Treatment
Bacterial conjunctivitis	Staph. aureus, Staph. epi, Strep. pneumo, Haem. influenzae, Moraxella catarrhalis, Pseudomonas	Preschool children Bilateral disease Mucopurulent discharge AOM	Topical antibiotics (fluoroquinolone or polymyxin B/trimethoprim)
Viral conjunctivitis	Adenovirus most common	Older than 5y Unilateral disease Redness and watery discharge Pharyngitis	Symptomatic Hand washing, extremely contagious!!
Allergic conjunctivitis	IgE mediated, airborne allergens precipitate mast cell degranulation, histamine, and inflammatory mediators release	Itching, conjunctival chemosis, pale edema, eyelid edema and watery or mucoid discharge	Cold compresses, artificial tears, topical antihistamines, mast cell stabilizers, topical nonsteroidal anti-inflammatory agents

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Psychosocial Issues

- ▶ DEATH AND GRIEF

- ▶ A child's understanding of death and expression of grief are influenced by his developmental level, his experience with death, and the family's cultural and religious beliefs.

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Psychosocial Issues

- ▶ DEATH AND GRIEF

- ▶ Preschool Children
 - ▶ Persistent separation anxiety more than 6 months after a predictable home life has been established
 - ▶ Continuing or worsening regressive behavior beyond 6 months from the death

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Psychosocial Issues

- ▶ DEATH AND GRIEF
 - ▶ School Age Children
 - ▶ Persistent or worsening school phobia or academic performance 3 months after the death
 - ▶ Detachment from peers or development of new social phobias
 - ▶ Increasing behavioral concerns (depression, moodiness, anger) 3 to 6 months after the death
 - ▶ Physical complaints without organic cause 3 months after the death

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Psychosocial Issues

- ▶ DEATH AND GRIEF
 - ▶ Adolescents
 - ▶ Increasing “high risk behaviors” with drugs, alcohol, delinquency, or precocious sexual activity
 - ▶ Withdrawal from peer interactions or group activities
 - ▶ Persistent somatic complaints for 3 months after the death

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Child Abuse/Neglect

- ▶ Nearly 90% of the perpetrators of child maltreatment are related caregivers
- ▶ Siblings of abused children are at increased risk of abuse
- ▶ Abusive parents often have unrealistic expectations for their children's behavior (expecting a newborn not to cry or an 8-month-old infant to be toilet trained).

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Child Abuse/Neglect

- ▶ Factors that increase risk of abuse
 - ▶ Child stresses- disability, hyperactivity
 - ▶ Social/situational stresses- poverty, isolation, family discord, multiple births, parent-child conflicts
 - ▶ Parent stress- abused as a child, depression, substance abuse

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Child Abuse/Neglect

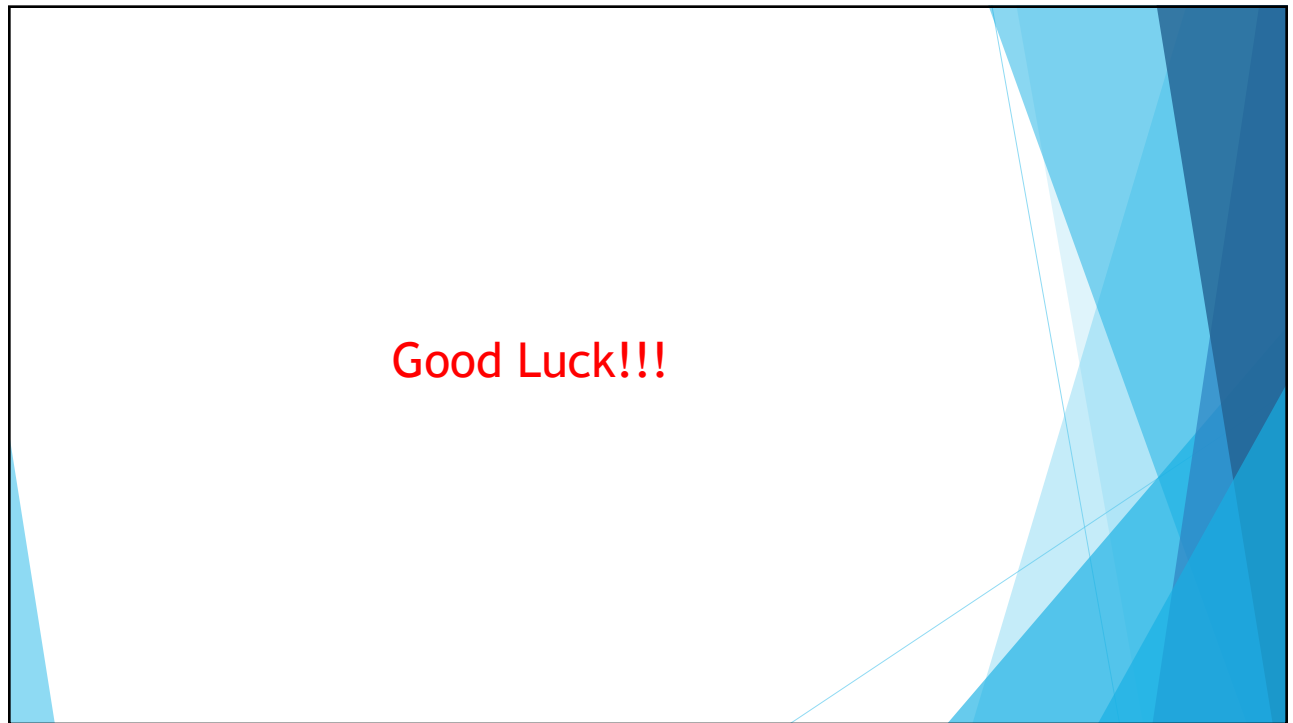
- ▶ Common fractures in child abuse
 - ▶ Spiral fractures of long bones- humerus, femur
 - ▶ Metaphyseal fractures- femur, tibia, humerus
 - ▶ Rib fractures- posterior, lateral
 - ▶ Vertebral bodies

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Ethics

- ▶ Concepts to review
 - ▶ End-of-life care
 - ▶ Withdrawal/Withholding care
 - ▶ Medical futility
 - ▶ Euthanasia
 - ▶ Confidentiality
 - ▶ Informed consent/assent/dissent
 - ▶ Minors as decision makers

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