

High Yield Pediatrics for the Shelf Exam

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Question 1 - Development

- An infant can move his head from side to side while following a moving object, can lift his head from a prone position 45° off the examining table, smiles when encouraged, and makes cooing sounds. He cannot maintain a seated position. The most likely age of this infant is:
 - c. 1 month
 - d. 3 months
 - e. 6 months
 - f. 9 months
 - g. 12 months

Question 1 (continued)

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High Yield Development - Motor

- **Term newborn** – alerts to sound, fixates on object briefly
- **2 months** – follows past midline, lift head/shoulders off bed when prone
- **4 months** – follows 180°, head control when seated, holds head up, rolls belly to back, bears weight on legs when standing
- **6 months** – reaches for objects, transfers from one hand to other, no head lag when pulled to sit, sits with support

Motor Development (continued)

- **9 months** – feeds self (fingers), early pincer grasp, bangs 2 objects together/holds 2 objects, sits unsupported
- **12 months** – can use cup with help, pulls to stand, cruises, neat pincer grasp, takes a few steps
- **15 months** – gives/takes toy, puts cube in cup, walks alone, stoops and recovers to stand, scribbles
- **18 months** – stacks 2 cubes, eats with spoon, runs, walks up steps w/ help, throws

Motor Development (continued)

- **24 months** – removes clothing, washes hands, 4-6 cubes, kicks ball, jumps
- **36 months** – puts on shirt, 8 cubes, stands on 1 foot for 1-2 sec, copies circle
- **4 yrs** – dresses alone, brushes teeth, copies cross, stands on 1 foot for 3 sec, hops on one foot, walks up/down steps
- **5 yrs** – skips w/ alternating feet, draws person with 6 parts, copies square
- **6 yrs** – ties shoes, copies diamond, rides bicycle

High Yield Development – Cognitive/Behavioral

- **2 months** – social smile, coos
- **4 months** – laughs/squeals, initiates social contact
- **6 months** – turns to voice, babbles, imitates sounds
- **9 months** – mama/dada as sounds, recognizes name, common objects, and people
- **12 months** – mama/dada with specific meaning plus one other word

Cognitive/Behavioral Development (continued)

- **15 months** – 3-6 words, follows simple commands
- **18 months** – 6 specific words, uses words for wants or needs
- **24 months** – 50+ words, 2 word phrases, points to named pictures, uses “I”, “Mine”, “Me”, points to body parts
- **36 months** – names friend, speech 50% intelligible, simple sentences

Cognitive/Behavioral Development (continued)

- **4 yrs** – speech fully intelligible, pretend play, names 4 colors, asks questions, relates events
- **5 yrs** – prepares cereal, plays board/card games, defines words, counts 5 objects, names primary colors
- **6 yrs** – writes name, counts 10 objects, knows right from left, knows color names

Question 2 - FUO

- A previously healthy 8-yr old boy has a 3-week history of low-grade fever of unknown source, fatigue, weight loss, myalgia, and headaches. On repeated examinations during this time, he is found to have developed a heart murmur, petechiae, and mild splenomegaly. The most likely diagnosis is:
 - c. Rheumatic fever
 - d. Kawasaki disease
 - e. Scarlet fever
 - f. Endocarditis
 - g. Tuberculosis

Question 2 (continued)

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High Yield FUO

Endocarditis

- new murmur
- petechiae
- splinter hemorrhages
- need blood cx
- echocardiogram
- abx for 4-6wks

Kawasaki Disease

- fever > 5d
- vasculitis
- lymphadenopathy
- non-purulent conjunctivitis
- “strawberry tongue”
- dry lips
- high ESR
- rash
- desquamation of palms and soles
- coronary artery aneurysms
- high dose aspirin and IVIG

High Yield FUO (continued)

UTI

- may have urinary sx.
- may just have fever
- *E. coli*, *Enterococcus*, *Proteus*, Staph species
- UA/UCx, shows bacteria, nitrites, LE
- obtain U/S and VCUG in young children
- 3rd generation cephalosporin until ID/sens are back

TB

- recently from endemic area
- relative with active TB
- fever
- lymphadenitis
- cough
- meningitis
- treat w/ 3 or 4 drugs (depends on resistance)
- PPD household
- monitor LFT's on INH

High Yield FOU (continued)

- HIV – CAN LOOK LIKE ANYTHING → fever, failure to thrive, weight loss, night sweats, cough, diarrhea, joint pain, renal failure, ANYTHING
- Can present with cancer or opportunistic infection as first presenting sign of HIV

Question 3 – Toxins/Drugs

- You are called to the emergency room to see one of your patients. The father of this 3-year old was spraying the yard with an unknown insecticide. In the ER, the child is noted to have bradycardia, muscle fasciculations, miosis, wheezing, and profound drooling. The most likely agent in this pesticide is:
 - c. Organophosphate
 - d. Chlorophenothane (DDT)
 - e. Sodium Cyanide
 - f. Atropine
 - g. Paraquat

Question 3 (continued)

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High Yield Toxins/Drugs

- Organophosphates – blocks acetylcholinesterase, get **drippy kids - wet and shaky** (fasciculations, diaphoretic, bradycardia, oral/respiratory secretions increase), treat with atropine
- Tylenol – toxicity due to build up of toxic byproduct (NAPQI) after using up glutathione stores, liver toxicity, check 4 hour level with normogram, treat with N-acetylcysteine

High Yield Toxins/Drugs (continued)

- Iron – early GI symptoms, then clinically improve, then 12-24hrs later severe metabolic acidosis and cell death, multisystem organ failure, deferoxamine to chelate
- Anticholinergics – plants, hallucinogens, atropine, scopolamine, antihistamines, antipsychotics, “Red.. Dry.. Blind.. Mad..”, dilated pupils, febrile, altered mental status, physostigmine for antidote, benzos for seizures, charcoal early

High Yield Toxins/Drugs (continued)

- Opiates – heroin, morphine, CNS depression, respiratory depression, miosis, naloxone and respiratory support
- Ethanol – alcoholic beverages, CNS and respiratory depression, shock, respiratory support, correct hypoglycemia

High Yield Toxins/Drugs (continued)

- Methanol – antifreeze, cleaning materials, headache, CNS alterations, intracerebral hemorrhage, blindness, metabolic acidosis, supportive care
- TCA's – amitriptyline, imipramine, has anticholinergic effects, dry mouth, constipation, flushing, dizziness, altered mental status, charcoal

Question 4 – Genetic Syndromes

- A mentally retarded 14 year-old boy has a long face, large ears, micropenis, and large testes. Chromosome analysis is likely to demonstrate which of the following?
 - b. Trisomy 21
 - c. Trisomy 18
 - d. Trisomy 13
 - e. Fragile X Syndrome
 - f. William Syndrome

Question 4 (continued)

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High Yield Genetic Syndromes

Fragile X

- most common cause of inherited mental retardation
- long, thin face
- large ears
- macroorchidism
- pectus excavatum

Trisomy 21 – Down's syndrome

- mental retardation
- atlanto-axial instability
- hypotonia
- prominent neck skin
- epicanthal folds
- upslanted palpebral fissures
- flat nasal bridge
- small ears
- simian crease
- endocardial cushion defect
- duodenal atresia
- omphalocele
- imperforate anus
- leukemia

High Yield Genetic Syndromes (continued)

Trisomy 13 – Patau syndrome

- cleft lip/palate
- postaxial polydactyly
- cutis aplasia
- microphthalmia
- abnl nose
- omphalocele
- hernia
- rocker bottom feet
- cardiac defects
- holoprosencephaly

Trisomy 18 – Edward syndrome

- retardation
- hypotonia, seizures
- prominent occiput
- microphthalmia, cataracts
- clenched hands
- syndactyly
- rocker bottom feet
- cardiac defects
- abnormal lungs
- GU anomalies

High Yield Genetic Syndromes (continued)

Turner Syndrome

- 45 X,O
- Redundant neck skin
- Webbed neck
- Short stature
- Edema over hands and feet at birth
- Streak gonads
- Low hairline
- Coarctation of aorta
- Bicuspid aortic valve

Klinefelter Syndrome

- 47, XXY
- Tall stature
- Long arms and legs
- Female fat distribution
- Hypogonadism
- Infertility
- Mitral valve prolapse

Question 5 – Nutritional Deficiencies - Matching

2. Thiamine

B. Pellagra

4. Vitamin D

D. Myalgia, brittle hair/hair loss, dermatitis

6. Niacin

F. Rickets, osteopenia

8. Zinc

H. Beriberi

10. Biotin

J. Dermatitis, immune disorders, poor growth, anorexia, alopecia

Question 5 – Nutritional Deficiencies - Matching

2. **Thiamine (Vit. B1) – Beriberi** (CHF, neuritis, abnl reflexes, psychological changes)
4. **Vitamin D – Rickets** (widened metaphyses, bowing deformities, rachitic rosary)
6. **Niacin (Vit B3) – Pellagra** (erythematous skin that becomes thickened & hyperpigmented, watery diarrhea, irritability)

Question 5 – Nutritional Deficiencies - Matching

4. Zinc – genetic form is *Acrodermatitis enteropathica*, dermatitis, immune disorders, poor growth, anorexia, alopecia

5. Biotin - Myalgia, brittle hair/hair loss, dermatitis

Macrocytic anemia – Folate (goat's milk) or Vit B12 (parasthesias, pernicious anemia)

Question 6 – Nursery Medicine

- A newborn infant develops respiratory distress immediately after birth. His abdomen is scaphoid. No breath sounds are heard on the left side of his chest, but they are audible on the right. Immediate intubation is successful with little or no improvement in clinical status. The most likely explanation of the infants condition is:
 - C. Pneumonia
 - D. Cyanotic heart disease
 - E. Diaphragmatic hernia
 - F. Choanal atresia
 - G. Pneumothorax

Question 6 – Nursery Medicine

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High Yield Nursery Medicine

Problems in the nursery:

- Diaphragmatic hernia – scaphoid abdomen, resp. distress and decreased breath sounds on that side
- Erb's Palsy – C5-6, arm internally rotated, forearm pronated/extended – “waiter’s tip” (can also have phrenic nerve involved – diaphragm!)
- Klumpke's paralysis – C7-8, T1, hand weakness, clasped, can have Horner's syndrome if sympathetic fibers are involved
- Hip dysplasia – “clunk”, breech presentation, first child, female, (+) ortolani and barlow maneuvers

High Yield Nursery Medicine (continued)

Birth trauma:

- Nerve injury (facial nerve palsy, brachial plexus)
- Cephalohematoma (subperiosteal blood, within suture lines)
- Caput succedaneum (subcutaneous fluid, crosses suture lines)
- Clavicular fracture

High Yield Nursery Medicine (continued)

Big Babies:

- 2) **Maternal diabetes** - get hypoglycemia, small left colon, polycythemia, hypocalcemia, hypomagnesemia
- 3) **Beckwith-Wiedemann Syndrome** – macroglossia, omphalocele or umbilical hernia, large organs, can have renal tumors

High Yield Nursery Medicine (continued)

Small Babies:

- 2) **Placenta problems** – placental insufficiency, placental abruption (cocaine!)

- 4) **Congenital infection** – TORCHes – Toxoplasmosis, Rubella, CMV, Herpes, Syphilis (also HIV, hepatitis, EBV)

High Yield Nursery Medicine (continued)

TORCHeS Infections:

- 2) Toxoplasmosis – hydrocephalus, rash, intracerebral calcifications, chorioretinitis
- 3) Rubella – cataract, hearing loss, rash, congenital heart diseases
- 4) CMV – periventricular calcifications, rash, chorioretinitis
- 5) Herpes – localized to skin/eyes/mucosa, or disseminated with irritability, jaundice, poor feeding
- 6) Syphilis – usually asymptomatic at birth, develop snuffles, rash, bony lesions, hepatomegaly

Question 7 – Acid/Base

- The arterial blood gas of an ill patient, while breathing room air, reveals the following: pH=7.1, PO₂=35, PaCO₂=28. These values indicate:
 - B. Acidemia, metabolic acidosis, respiratory alkalosis, and hypoxia
 - C. Alkalemia, respiratory acidosis, metabolic alkalosis, and hypoxia
 - D. Acidosis with compensatory hypoventilation
 - E. Long-term metabolic compensation for respiratory alkalosis
 - F. Primary respiratory alkalosis

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High Yield Acid/Base

	pH	pCO ₂	HCO ₃
Metabolic Acidosis	low	nl	low
Metabolic Alkalosis	high	nl	high
Respiratory Acidosis	low	high	nl
Respiratory Alkalosis	high	low	high

Question 8 - GI

- A 4 week old boy presents with a 10-day history of vomiting that has increased in frequency and forcefulness. The vomitus is not bile stained. The child feeds avidly and looks well, but has been losing weight. The most likely diagnosis is:
 - C. Pyloric stenosis
 - D. Small intestinal obstruction
 - E. Gastroenteritis
 - F. Intussusception
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High Yield GI

1. **Pyloric Stenosis** – 3-6 wks, projectile vomiting, non-bilious, hypokalemia, hypochloremia, metabolic alkalosis
3. **Intussusception** – common in 1- 3 yrs, colicky abdominal pain, vomiting, “currant jelly stool”, in older kids look for lead point, recent URI
5. **Gastroenteritis** – vomiting AND diarrhea, fever

High Yield GI (continued)

- 4. **Hirschprung's** – chronic constipation, late stooling at birth with abdominal distention, **no overflow diarrhea** (think functional constipation)
- Trisomy 21 – Hirschprung's, duodenal atresia
- Cystic fibrosis – rectal prolapse, pancreatitis

Question 9 – Vaccines

- Your 18-year-old college freshman calls that he has had fever, muscular pain (especially in the neck), headache, and malaise. He describes the area from the back of his mandible toward the mastoid space as being full and tender and that his earlobe on the affected side appears to be sticking up and out. Drinking sour liquids causes much pain in the affected area. You retrieve his immunization card and realize he has not been vaccinated for:
 - B. Mumps
 - C. Varicella
 - D. Rubella
 - E. Measles
 - F. Herpangina

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High Yield Vaccine Info (continued)

What do we routinely children for?

- DTaP (Diphtheria toxoid, Tetanus toxoid, and acellular Pertussis) – 2, 4, 6mo, 15mo, 5 yrs. (5 doses total)
- D. Diphtheria – *Corynebacterium diphtheriae*, toxin mediated, URI sx., low-grade fever, lymphadenopathy, pseudomembrane on pharynx that bleeds when scraped.
- F. Tetanus – *Clostridium tetani*, neurotoxin, hypertonia, muscle spasm, give with dirty injury, Td booster q10years.
- C. Pertussis – *Bordatella pertussis*, “whooping cough”, 1st is catarrhal phase w/ URI, very contagious!, 2nd is paroxysmal phase w/ intense coughing, 3rd is convalescent phase w/ chronic cough and recovery. Supportive care, tx. works in catarrhal phase (erythromycin), treat household contacts!

High Yield Vaccine Info

- **IPV** – inactivated polio virus, 2, 4, 6 mo, 5 yrs. (4 doses total)
- **Hepatitis B** – HBsAg, birth, 1-2 mo, 6-12mo. (3 doses total)
- **Hib** – *Haemophilus influenzae* type B conjugate vaccine, 2,4 mo, 6mo (depending on type) 12-15mo, (3 or 4 doses total), was a major cause of meningitis, **epiglottitis**, AOM (still have non-typeable *H. flu*)

High Yield Vaccine Info (continued)

- MMR – live attenuated measles, mumps, and rubella viruses, 12mo and 5 yrs (2 doses total)
- C. Measles – “rubeola”, fever, cough, coryza, conjunctivitis, “Koplik spots”, rash (face→trunk→extrem)
- E. Mumps - Fever, malaise, then get ear pain/swelling→parotitis, orchitis, meningoencephalitis
- G. Rubella – congenital infection, fever and lymphadenopathy, rash (face→trunk→extrem)

High Yield Vaccine Info (continued)

- **Varicella** – 15mo. (one dose unless receiving after 13yrs, then 2 doses)
“chicken pox”, incubation 10-14 days, prodrome, fever, lesions in various stages,
 - neonatal varicella – **5 days before or 2 days after delivery** treat w/ VZIG and acyclovir
 - congenital varicella – IUGR, microcephaly, cataracts, scarring of skin

High Yield Vaccine Info (continued)

- **Pneumococcal conjugate vaccine** – 2,4,6 mo., 12-15 mo (4 doses total), 7 serotypes, 23 valent for high risk children
- **Influenza** – inactivated virus, give yearly (young children need 2 doses), give to high risk kids under 6 mo.
- **Intranasal flu vaccine is live, attenuated, NOT for high risk patients**

Question 10 - Cardiology

- During a regular checkup on an 8-year-old child, you note a loud first heart sound with a fixed and widely split second heart sound at the upper left sternal border that does not change with respirations. The patient is otherwise healthy and active. The most likely heart lesion is:
 - B. Atrial septal defect
 - C. Ventricular septal defect
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High Yield Cardiology

- ASD – usually asymptomatic until later in childhood, may have prominent RV impulse, LUSB, **wide fixed split 2nd heart sound**
- VSD – may be asymptomatic or have poor growth, **holosystolic, harsh murmur at LLSB**, NOT heard in first few days of life
- PDA – common in preemies, “**continuous machine murmur**”, systolic, LUSB, close with indomethacin, keep open with prostaglandin
- MVP – midsystolic ejection **click**, systolic murmur
- Tricuspid regurg. – Holosystolic murmur, diastolic rumble

High Yield Cardiology (continued)

Cyanotic Congenital Heart Disease:

- Truncus Arteriosus
- TAPVR
- Transposition of the Great Arteries
- Tetralogy of Fallot
- Pulmonary/Tricuspid atresia
- Single Ventricle
- Hypoplastic Left Heart Syndrome

High Yield Cardiology (continued)

Acyanotic Congenital Heart Disease:

- VSD/ASD
- Coarctation
- Aortic/Mitral Stenosis
- PDA
- MVP

Final High Yield Points

- RSV – winter, bronchiolitis, supportive care, palivizumab (Synagis) for high-risk
- Asthma – action plans, beta agonists, steroids, eczema, atopy, environment
- Croup – barking cough, viral (don't confuse with pertussis – whooping cough)
- Safety – bike helmets, rear-facing car seats for infants, pool fences for drowning prevention
- Child abuse – injury doesn't fit description, spiral fracture, bucket handle fracture, corner chip fractures, burns from objects, submersion, genitalia may appear normal with sexual abuse
- Teens – HEADSS, drug/alcohol abuse, suicide risk, obesity

References

- E-medicine: Pediatric Specialties, www.emedicine.com
- AAP: Practice guidelines, PREP curriculum, www.aap.org
- Nelson's Textbook of Pediatrics

GOOD LUCK!!

