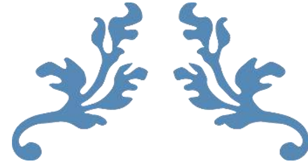

PEDIATRIC OSCE

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Index

Topic	Page
Red Urine	3
Arthritis	6
Convulsion	9
Febrile Convulsions	12
Jaundice – Child	15
Neonatal Jaundice - Indirect	17
Neonatal Jaundice - Direct	20
Pallor	22
Lower Limb Swelling	25
Acute/Chronic Cough	28
Vomiting	32
Chronic Diarrhea	34
Headache	37

Approach to Red Urine

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (Red urine), and duration?
- ***Previous episodes***

- ***Urine color***: bright red (extra-glomerular), brown red (glomerular)
- ***Timing***: initial (urethral), pan (ureter/kidney), terminal (bladder)
- ***Clots***: Glomerulonephritis (GN), Stones

DDx	Questions
Vigorous exercise	
Trauma	
Food	Beet root, berries
Drugs	Rifampicin, cyclophosphamide, anticoagulants
UTI	fever, flank/loin pain, dysuria, frequency, urgency, new onset enuresis
Urinary tract stones	(Obstructive): hesitancy, intermittency, oliguria
Glomerulonephritis	headache, lower limp-edema, eye puffiness typically upon awakening
Poststreptococcal glomerulonephritis (PSGN)	sore throat or skin infection (in past 1-2 weeks)
IgA nephropathy (Berger's)	URTI in the past 1-2 days
Systermic lopus erythematous	malar rash, painless oral *ulcers*, photosensitivity, chest pain
Henoch-Schönlein purpura (HSP)	abdominal pain, joint pain, rash over lower extremities
Hemolyti uremic syndrome (HUS)	abdominal pain, bloody diarrhea (past 10 day)
G6PD	fava beans ingestion, jaundice, pallor, *FHx* of (G6PD, thalassemia, sickle cell disease)
Good pasture (Wegner granulomatosis)	hemoptysis, nasal *ulcers*, night sweats
Alport Syndrome	deafness, family hx of renal failure (*FHx* pf RF)
Wilm's Tumor	weight loss, anorexia, abdominal mass
Hemophilia	nasal, gum bleeding, *FHx* of hemophilia

Physical Examination

- ***General look***
- ***Vital Signs***: blood pressure is very important as nephritis causes HTN
- ***Growth parameters***

Organ	What do you look for
Eye	Jaundice, pallor (*Hemolysis*)
Face	Malar rash (*SLE*)
Oral	Ulcers, pharyngitis (*IgA nephropathy*)
Abdomen	- *Inspection* - *Palpation*: mases, tenderness (suprapubic, flank, costovertebral angle CVA), bladder, organomegally - *Percussion*: shifting dullness, transmitting thrills - *Auscultation*: over renal artery
Genitalia	meatal erosions/ulcers, swelling
Legs	edema, rash, arthropathy (*SLE/HSP*)

Investigations

Test	What do you look for
CBC	Anemia (G6PD), leukocytosis (infection)
Urine Analysis	- RBCs (dysmorphic suggests GN) - RBC Casts (suggests GN) - Protein (suggests GN)
Urine dip-test	leukocyte esterase, nitrite
Urine culture	
Antibodies	C3,C4 (low in PSGN), ANA, Anti-DsDNA Ab, Anti-smith, Anti-GBM
Other	Anti-steptolysin O (ASO), Anti DNase B
KFT	↑ SCr & BUN suggest nephritis
Electrolytes	
KUB	Stones
CT	Trauma, Wilm's tumor
G6PD Analysis	
Biopsy	

Kidney Biopsy Indication (common question):

2- For the cause → Renal biopsy

- Not indicated if MCNS is suggested.
- Indications.

Before treatment:

- Age < 1 **or** >12 years.
- Gross hematuria.
- Renal failure
- Low C3

After treatment:

- Steroid resistant nephrotic syndrome.
- Frequent relapser

Management

Dx	Mx
UTI	➢ Antibiotic choice: Sensitivity testing. ➢ Outpatient: Co-trimoxazole, 2nd generation cephalosporins Fluoroquinolones ➢ Inpatient: Aminoglycosides., 3rd/4th generation cephalosporins. ➢ Duration: 5 days in lower UTI, 10-14 days in upper UTI
PSGN	➢ *Sodium restriction,* ➢ *diuresis (IV furosemide)* ➢ *calcium channel Blocker (CCB)* ➢ *vasodilator* ➢ *ACEIs* used to treat HTN
SLE	➢ Mild: NSAIDs, hydroxychloroquine ➢ Moderate: High dose glucocorticoids, mycophenolate mofetil ➢ Severe: Cyclophosphamide, prednisone

Approach to Arthritis
History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (painful knee swelling), duration?
- ***Previous episodes***

- ***Other Joints Involved?***
- ***SOCRATES***
- ***Progression***? Improving or worsening

DDx	Questions
Trauma	
Septic Arthritis	fever, chills, rigors, fatigue
Brucellosis	ingestion of unpasteurized milk, contact animals
Rheumatic fever (RF)	is the joint improving and another joint is getting involved (migratory arthritis), Hx of sore throat, skin infection (SOB, cough, less exercise)
Reactive arthritis	Triad (mnemonic: can't pee can't see, can't bend my knee): dysuria, Hx of GI/UTI infection
Inflammatory Rheumatoid Arthritis (IRA)	morning stiffness
SLE	malar rash, photosensitivity, chest pain, seizures
IBD	abdominal pain, eye Sx, oral ulcers, bloody diarrhea
HSP	red urine, rash over lower extremities
Hemophilia	nose/gum leeding, FHx of hemophilia
Malignancy	pallor, weight loss, bruises
FHx	FHx of IRA, Familial Mediterranean fever (FMF)
Vaccines	Hib, PCV-13
Surgical Hx	Hx of Appendectomy

Physical Examination

- ***General look***
- ***Vital signs***: HR, RR, Temp, BP, O2 sat
- ***Growth parameters***: weight, head circumference, height

Organ	What to look for
Eye	Conjunctivitis, Uveitis, lazy cornea, hypopion, Redness, Pallor
Face	rash (discoid, malar), micrognathia (small jaw)
Oral	ulcers, pharyngitis
Neck	LNs examination
Chest	***a***. ***CVS***: pericardial rub, murmurs (**aortic insufficiency**: diastolic murmur heard on left upper sternal border / **mitral regurgitation** (pansystolic systolic murmur heard on the apex with radiation to the axilla) ***b***. ***RS***: pleural rub
Abdomen	Organomegally
Knee (Joint)	- *inspection*: redness, swelling, scars - *palpation*: tenderness, temperature - *movement*: passive and active movement - *special movement tests*: juxtra-patellar hollow test, tap test, effusion test, milking test - inspect *gait* - *limb length* disturbance

Investigations

Test	What to look for
CBC	Leukocytosis (inflammation), Anemia
ESR/CRP	Elevated in inflammation
Aspiration	For septic arthritis
Antibodies	C3,C4 (low in PSGN), ANA, Anti-DsDNA Ab, Anti-smith, Anti-GBM
ASO	Evidence of bacterial infection for Rheumatic fever

Management

Dx	Mx
Rheumatic Fever	➢ Bed rest, ➢ Antibiotics (**Penicillin G** or Amoxicillin, Erythromycin, Azithromycin, clindamycin), ➢ Corticosteroids
Septic Arthritis	➢ Drainage and debridement
SLE	➢ Mild: NSAIDs, hydroxychloroquine ➢ Moderate: High dose glucocorticoids, mycophenolate mofetil ➢ Severe: Cyclophosphamide, prednisone

Jones Criteria for Rheumatic Fever (common question):

Rheumatic Fever: Criteria

knowmedge

Mnemonic: "JONES CAFE PAL"

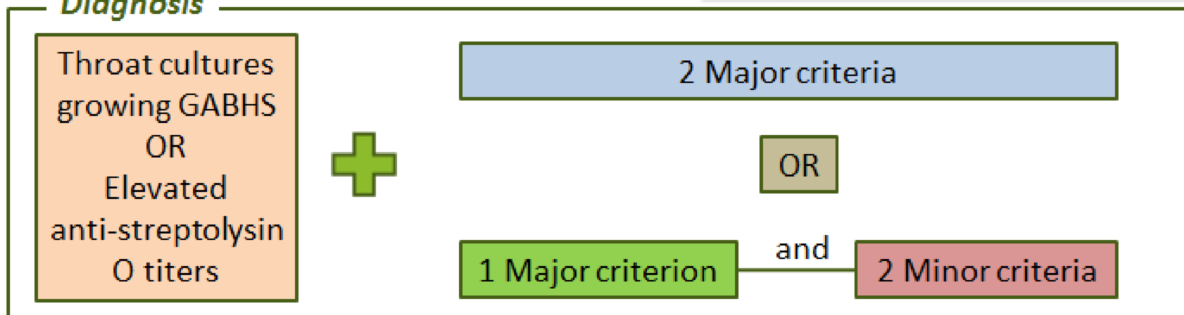
Major Criteria

J	Joint Involvement
O	**O** looks like a heart = myocarditis
N	Nodules, subcutaneous
E	Erythema marginatum
S	Sydenham chorea

Minor Criteria

C	CRP Increased
A	Arthralgia
F	Fever
E	Elevated ESR
P	Prolonged PR Interval
A	Anamnesis of Rheumatism
L	Leukocytosis

Diagnosis



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Approach to Convulsions
History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (Abnormal movements, sensations), and duration?
- ***Previous episodes***

- With ***fever***/***not*** ?
- How many times (***frequency***)?

Pre-ictal stage	➢ What was he doing before the attack (crying, playing, sleeping,.. etc) ➢ before the attack did she complain of anything?
Ictal stage	➢ Duration of the attack? ➢ did it involve part or the whole body? (Was it symmetrical on both sides?) ➢ was he responsive during the attack? ➢ Was there any abnormal movements (tongue bite, eye rolling, …) ➢ type: ***clonic*** (rhythmic), ***tonic*** (rigid), ***myoclonic*** (muscle contractions), ***atonic*** (flaccid) ➢ how did it stop? Spontaneously or with medications
Post-ictal	➢ How was the child after the attack (sleep, crying, in pain..) ➢ did he remember what happened?

DDx	Questions
Trauma	
neurocutaneous disorders	Skin rash
Feeding	Hypoglycemia – type, frequency
Dehydration	thirst, oliguria, dry mouth, absent tears
Malignancy	weight loss, anorexia, vomiting, early morning headaches
FHx	FHx of epilepsy, neurological disorders, heart problems
Developmental Hx	
medications taken	
Hx of meningitis	
Prenatal	complications, drugs, smoking
Perinatal	delivery complications, birthweight, ICU admission

Physical Examination

- ***General look***
- ***Vital signs***
- ***Growth parameters***
- ***Signs of dehydration***
- ***Glasgow Coma Scale*** (***GCS***)
- ***Mental status*** (place, time, person)
- ***Glucose check***

Organ	What to look for
Eye	sclera, conjunctival telangictasias, Lisch spots, coloboma, cataract, ***fundoscopy (for papilledema)***
Ear	Otitis media
Face	dysmorphic, port wine stain (sturge weber), sebecum adenomas (TS)
Cardiac	murmurs
Abdomen	organomegally
Skin	Ash-leaf spots (TS) Café au lit spots (neurofibromas NF1) axillary freckles
Hands	for deformities
Neurological	- *Meningeal signs*: nuchal rigidity, Brudizinski, Kernigs sign - *Cerebellar signs* - *Cranial nerve examination* (*CN*) - *Muscle tone*, *reflexes*, *clonus*, *Babinski* sign

Investigations

Test	What to look for
CBC	
Electrolytes	hypocalemia, magnesemia, hyponatremia, hypernatremia
Blood glucose	
ABG & pH	
Blood urine toxicology	
Metabolic workup	
Anti-seizure drug level	
EEG	
Neuroimaging	MRI superior to CT

Management

ABC	
2 IV lines	
Pulse oximeter	
to stop seizure	- **IV bendiazebines** (**diazebam**, **lorazebam**), slow IV push over minute if not stopped additional 2nd dose (wait for 5 min from the 1st), be aware of respiratory depression, if not: - **Phenytoin** continuous infusion wait for 5 min, if not additional 2nd dose is given, risk of local pain and injury including venous thrombosis, purple gloves syndrome (edema, discoloration, pain distal to site of infusion) in severe cases limb ischemia & skin necrosis that may require amputation - **Phenoparbital** & **valproate** then induction of coma via continuous infusion of **midazolam**, **propofol** then prophylactic management based on the lecture
hypoglycemia	give bolus IV 10% **glucose saline**

Approach to Febrile Convulsions

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (Abnormal movements, sensations), and duration?
- ***Previous episodes***
- **with fever/not**? Height route of measuring, duration, progression

Pre-ictal stage	➢ What was he doing before the attack (crying, playing, sleeping,.. etc) ➢ before the attack did she complain of anything?
Ictal stage	➢ Duration of the attack? ➢ did it involve part or the whole body? (Was it symmetrical on both sides?) ➢ was he responsive during the attack? ➢ Was there any abnormal movements (tongue bite, eye rolling, …) ➢ type: ***clonic*** (rhythmic), ***tonic*** (rigid), ***myoclonic*** (muscle contractions), ***atonic*** (flaccid) ➢ how did it stop? Spontaneously or with medications
Post-ictal	➢ How was the child after the attack (sleep, crying, in pain..) ➢ did he remember what happened?

DDx	Questions
Meningitis	headache, photophobia, neck pain, vomiting, rash
Otitis Media	ear pain, discharge
URTI	nasal congestion, discharge, sore throat, cough
Gastroenteritis	abdominal pain, distention, blood in stool (shigella)
UTI	frequency, urgency, dysuria, blood
Skin infection	
Joint pain, swelling, redness	
Exposure to a pt with infection	
Trauma	
Hx of cardiac disease, edema, cyanosis, SOB	
Feeding	Appetite
Vaccines	recent DTP/MMR, PCV-13, meningococcal
Hx of meningitis	
Prenatal and perinatal Hx	complications, drugs, smoking / delivery complications, birthweight, ICU admission

Physical Examination

- ***General look***
- ***Vital signs***
- ***Growth parameters***
- ***Glasgow Coma Scale*** (***GCS***)
- ***Mental status*** (place, time, person)
- ***Glucose check***

Organ	What to look for
Eye	***fundoscopy (for papilledema)***
Ear	Otitis media, Mastoiditis
Skin	Rash
Neurological	- *Meningeal signs*: nuchal rigidity, Brudizinski, Kernigs sign - *Cerebellar signs* - *Cranial nerve examination* (*CN*) - *Muscle tone*, *reflexes*, *clonus*, *Babinski* sign

Investigations

Test	What to look for
CBC, ESR, CRP	
Electrolytes and blood glucose	
LP with CSF analysis & culture	
Throat swap culture	
EEG, Neuroimaging	

Management

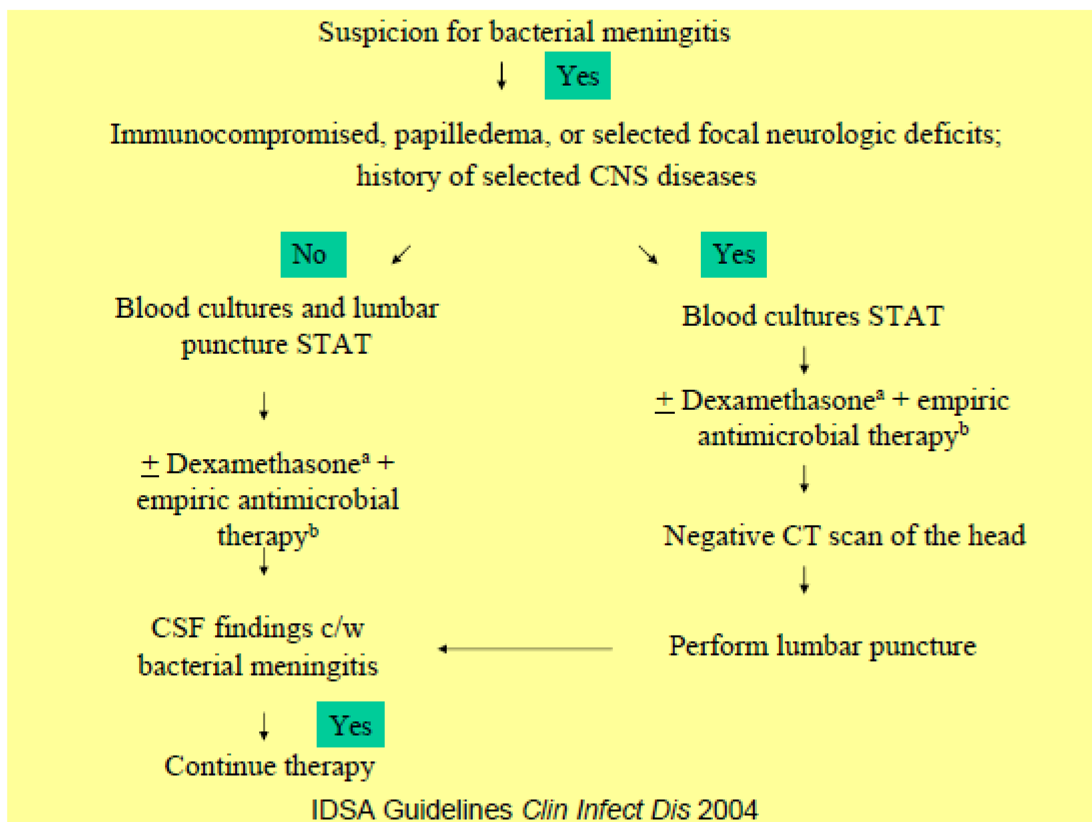
Empiric Mx	Ceftriaxone or Cefotaxime + Vancomycin (Ampicillin + Gentamicin for newborns)
Bacterial	Ceftriaxone + Vancomycin
Viral	Acyclovir mostly
Steroids	Might be given in some cases

Duration of treatment Bacterial Meningitis

- **S. pneumoniae**: 10-14 days
- **N. meningitidis**: 5-7 days
- **Hib**: 7-10 days
- ***L. monocytogenes*** – 14 to 21 days
- ***S. aureus*** – at least 2 weeks
- **Gram –ve**: 3 weeks

Contraindication for LP

- Suspected brain abscess or subdural empyema (20% herniation)
- Bleeding disorders
- Skin infection at site of LP
- Papilledema? (1-6% herniation after LP)



Approach to Jaundice – Child

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (yellow discoloration), and duration?
- ***Previous episodes***

- ***Describe it***:

- SOcraTEs

S – *site*: where was it noticed?

O – *onset*: sudden or gradual?

T – *Intermittent* or *constant* / *progression*?

E – *E/R* factors

DDx	Questions
Pre-hepatic	- *G6PD*: pallor, exercise intolerance, ingestion of fava beans - *FHx* of G6PD, hemolytic anemias, Splenectomy
Hepatic	- *hepatitis*: fever, fatigue, anorexia, abdominal pain, diarrhea, vomiting - *Hx*. exposure to a jaundice patient / hepatitis patient / liver surgeries - *Personality changes*, behavioral changes, seizures, hematemesis (vomiting blood), blood in stool, easy bleeding, bruises and edema
Post-hepatic	- *Obstructive* features: color of stool (pale), urine (dark), itching
Extra-hepatic	- *Cystic fibrosis*: chronic diarrhea, steatorrhea, recurrent sinopulmonary infection, failure to thrive (FTT), family Hx of CF - *Hypothyroidism*: cold intolerance, fatigue, lazy, weight gain, constipation - *Hx* of thyroid diseases
Other	- *Consanguinity* - *FHx* of liver transplant/disease - *Drug* hx, *travel* hx - *Perinatal care*: if the mother had hepatitis A/B/C at time of delivery

Physical Examination

- ***General look***: pallor, jaundice, ill, malnourished, muscle wasting
- ***Vital Signs***
- ***Growth parameters***

Organ	What to look for
Eye	dysmorphism
Face	pallor, jaundice, ***Kayser–Fleischer*** (***KF***) ***rings***, Alagile features
Neck	spider angiomas
Chest	spider angiomas, murmurs
Abdomen	- *inspection*: distention, dilated veins - *palpation*: tenderness, organomegally, liver span, transmitted thrills - *percussion*: shifting dullness - *auscultation*
Hands	palmer erythema
Legs	edema
Skin	rash, itchy mark

Investigations

Test	What to look for
CBC	
LFT (ALT/AST)	
ALP/GGT	
PT, PTT, INR, Albumin, Glucose	
Anti-HAV IgM, HBsAg, HBc RNA, PCR	
TFT (TSH, T3, T4)	
Sweat chloride test	

Approach to Indirect Jaundice – Neonatal

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (yellow discoloration) & duration, which day of life noticed?
- ***Previous episodes***

- ***Describe it***:

- SOcraTEs

S – *site*: where was it noticed?

O – *onset*: sudden or gradual?

T – *Intermittent* or *constant* / *progression*?

E – *E/R* factors

DDx	Questions
Pre-hepatic	• Isoimmune hemolysis: mother and baby blood groups, & previous pregnancies • Sepsis: fever, hypoactivity, irritability, poor feeding • ***TORCH***: have you been exposed to rubella, did you have it, unexplained fever, rash, do you have cats • ***G6PD***: pallor, hx of hemolytic anemias, G6PD
Hepatic	-
Post-hepatic	• ***Pyloric stenosis***: abdominal distention after feeding with projectile vomiting of anything he eats, delay passage of meconium
Extra-hepatic	• ***Hypothyroidism***: macroglossia, weak cry, infrequent stooling • *Ear discharge*, *cough*, *vomiting*, *crying upon micturition*, *strong urine smell*, *joint swelling*
Other	• ***maternal Hx*** of thyroid disease, or anti thyroid drugs, and thyroid screening newborns • ***Breast fed***, ***milk jaundice***: type of feeding, duration, and frequency • ***Family Hx***. Of hemolytic anemias, splenectomy, blood disorders, liver disorders • ***Perinatal Hx***: maternal DM, gestational age, birth weight, birth trauma

Physical Examination

- ***General look***: pallor, jaundice, ill, malnourished, muscle wasting
- ***Vital Signs***
- ***Growth parameters***

Organ	What to look for
Face	dysmorphism
Eye	pallor, jaundice, red reflex (cataract), retinitis pegmintosa (ophthalmoscope), ***Kayser–Fleischer*** (***KF***) ***rings***
Neck	spider angiomas
Chest	murmurs, Congestive heart disease (CHD – Alagile features)
Abdomen	- *inspection*: distention, dilated veins - *palpation*: tenderness, organomegally, liver span, transmitted thrills,.. - *percussion*: shifting dullness, transmitting thrills - *auscultation*
Legs	edema
Skin	petechial rash, itchy mark

Investigations

Test	What to look for
CBC	
LFT (ALT/AST), ALP/GGT	
PT, PTT, INR, Albumin, Glucose	
Anti-HAV IgM, HBsAg, HBc RNA, PCR	
TFT (TSH, T3, T4)	
If Wilson suspected	✓ Serum cerulopasmin (low) ✓ Blood copper (high) ✓ 24 urine for copper (high)
If Autoimmune hepatitis (AIH) suspected	✓ Gamma-globuline level (high) ✓ ANA, ASMA, LKM1
If G6PD suspected	✓ G6PD enzyme analysis
US	
ERCP	
Liver biopsy	

Management

- **based on the cause**

Wilson Disease	• **Compensated liver disease** ✓ Chelating agents: Penicillamine or Trientine ✓ Zinc therapy to suppress Cu intestinal absorption ✓ Dietary restriction for food containing Cu • **Liver transplant** for decompensated cirrhosis or fulminant liver failure (curative) • **Screen the siblings** with ceruloplasmin or genetic mutation if it is known from proband case

Approach to Direct Jaundice – Neonatal

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (yellow discoloration) & duration, which day of life noticed?
- ***Previous episodes***

- ***Describe it***: SOcraTEs

S – ***site***: where was it noticed?

O – ***onset***: sudden or gradual?

T – ***Intermittent*** or ***constant*** / ***progression***?

E – ***E/R*** factors

- ***Color*** of urine and stool: dark urine, pale stool

DDx	Questions
Pre-hepatic	• ***Sepsis***: fever, hypoactivity, poor feeding, irritability
Hepatic	-
Post-hepatic	• ***Biliary atresia***: abdominal distention, easy bleeding, bruising, edema
Extra-hepatic	• ***Hypothyroidism*** • ***Cystic fibrosis*** (***CF***): recurrecnt sinopulmonary infections, statorrhea, FHx
Other	• ***Consanguinity*** • ***Feeding***: type, amount, frequency • ***FHx*** of liver disease, transplant • ***Perinatal***: delivery mode, asphyxia, prematurity, low birth weight (LBW), trauma, if he was a part of twins, if instruments were used

Physical Examination

- **Same as the previous topic "the indirect jaundice approach"**

Investigations

Test	What to look for
Total & Direct serum albumin	
ALT, AST, GGT, ALP	
Function of liver (PT, PTT, INR, Albumin, Glucose)	
CBC	
Urine analysis and culture	
Urine testing of reducing substances	
Blood culture	
TFT	
Alpha-1-antitrypsin	
Sweat chloride test or gene testing	
Ammonia, pH, CO	
US	
HIDA scan	
MRCP	
Biopsy	
Intra-operative cholangiogram	

Management

- **based on the lecture**

Biliary Atresia

Dx	Mx
✓ **Abdominal US**: - Gallbladder absent/irregular - Triangular cord sign ✓ **Hepatobiliary scintigraphy:** - Failure of tracer excretion ✓ **Liver biopsy** ✓ **Intra-operative cholangiogram: GS!**	✓ **Kasai procedure** ✓ **Liver transplantation**

Approach to Pallor

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (Pallor), and duration?
- ***Previous episodes***

- ***Describe it***:

S – ***site***: where was it noticed?

O – ***onset***: sudden or gradual?

T – ***Intermittent*** or ***constant*** / ***progression***?

E – ***E/R*** factors

- ***General Sx of anemia***: headache, dizziness, SOB & less exercise intolerance

DDx	Questions
Iron Deficiency Anemia (IDA)	diet, anorexia, **pica**, melena, hematochezia (fresh stool blood)
Folate/B12	meat and vegetables, paresthesia's (CNS involvement)
Malabsorption	failure to thrive (FTT), abdominal distention, chronic diarrhea
Consanguinity	
Hemolysis	dark urine, gallstones
G6PD	ingestion of fava beans, drugs (PAINS) , FHx (P: Primiquine, A: Aspirin, I: Isoniazide, N: Nalidixic acid, S: Sulphamethaxone)
Sickle	recurrent hand, foot, chest, abdominal pain, FHx of sickle
Spherocytosis	FHx of splenectomy
FHx	FHx of anemia, thalassemia, gallstones
Bleeding	bleeding, epistaxis, gums bleed, skin rash, bruises, FHx
Leukemia	fever, weight loss, hypoactivity, FHx
Chronic disease anemia	hx of liver, cardiac, renal, recurrent hx of admissions
Perinatal care	Neonatal jaundice, NICU admission
Blood loss	signs of dehydration (thirst, oliguria, tears), hemorrhage, post-surgical bleeding
HSP	easy bleeding, joint pain, rash, abdominal pain)
Diet	

Physical Examination

- ***General look***: pallor, jaundice, ill, malnourished, muscle wasting
- ***Vital Signs***
- ***Growth parameters***

Organ	What to look for
Eye	pallor, jaundice
Face/head	features of extramedullary hematoporosis: frontal bossing, prominence of malar eminence, depressed nasal bridge, exposed upper central teeth, dysmorphic features (like fanconi anemia)
Mouth	*Glossitis*, *angular stomatitis*
Neck	Lymph nodes for malignancy
Chest	lung for infiltration due to malignancy, cardiac for murmurs Cardiac: *flow murmur*
Abdomen	hepatosplenomegaly, scars (splenectomy)
Hand	absent thumb (fanconi), kolionycia (iron deficiency)
Legs	Edema, rash
Skin	Café au lit spots (fanconi), petechial, *purpuric rash*, *bruises* (bleeding)

Investigations

Test	What to look for
CBC	(Hb level, WBCs, Platelet), MCV (micro, normo, macro)
TIBC, Ferritin	
B12 level	
Reticulocyte count	(increase – hemolysis / decrease – anemia of decreased production or bone marrow failure)
Peripheral blood smear	
G6PD analysis	
Osmotic fragility test	hereditary spherocytosis
Coombs test	for immune
PT, PTT, bleeding time	if bleeding present
Bone marrow biopsy	
Chromosomal breakage	Fanconi
Hb electrophoresis	

Management

- **based on the cause**

IDA	• **Mx of IDA:** ✓ Start supplemental iron ✓ Increase consumption of iron rich food like: meat, fish • **Duration of Mx:** ✓ Around 3-4 months • **If there is no response to the iron Rx: what is your explanation?** ✓ Non-compliance ✓ Malabsorption ✓ Thalassemia minor

Approach to Lower Limb / Periorbital / Generalized Swelling

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (Swelling), and duration?
- ***Previous episodes***

- ***Describe***:

- Sudden/gradual
- Constant/intermittent
- Other sites

DDx	Questions
Trauma	
If leg swelling	Fever, erythema, hotness, pain, restriction of range of movement
Allergy	***insect bite***, drug
FHx of Allergy	FHx of asthma, eczema, allergy
Cardiac CHF	Shortness of breath, orthopnea, exertional dyspnea, cyanosis, FHx
Liver failure	jaundice, fatigue, malaise, hematemesis, blood per rectum, bruises, exposed to hepatitis patient, previous blood transfusions, FHx of transplant
Renal failure	headache, facial puffiness, oliguria, red urine
Nephrotic Syndrome	Other sites of swelling, frothy urine (ASK about the nature of urine!)
PSGN	recurrent skin, throat infection
HUS	Hx of gastroenteritis (*GE*), bloody diarrhea
SLE	malar rash, photosensitivity, oral ulcers, chest pain
Alport syndrome	Deafness, FHx of renal transplant/chronic kidney diseases
hypothyroidism	cold intolerance, weight gain , lazy

Physical Examination

- *General look*
- *Vital Signs*
- *Growth parameters*

Organ	What to look for
Eye	Jaundice, periorbital swelling
Oral	ulcers (SLE)
CVS	(full examination)
RS	(full examination): crepitation, pleural effusion (dullness & less air entry) signs of pleural effusion
Abdomen	Masses (liver, ascites, shifting dullness, transmitted thrills) Organomegally, Signs of liver disease (caput medusa,..)
Groin	scrotal swelling
Lower limb	edema
Back	sacral edema

Investigations

Test	What to look for
CBC	Hemoglobin, WBC, Platelets
Urine analysis, Urine Dipstick	RBCs, Casts, Protein: 1 + = 0.3 gm/L 2 + = 1 gm/L 3 + = 3 gm/l 4 + > 4 gm/L
KFT	urea, creatinine, HCO-3 ,Na+, K
LFT	
Total protein, Albumin	
24-hour protein	
urine Prot./Creat. Ratio.	
C3, C4	
ANA, Anti-DsDNA	
HBsAg	
Serum Lipids	Cholesterol, TG, LDL, HDL
Kidney Biopsy	

Causes of Nephrotic Syndrome:

Primary "Idiopathic" (95%)
- Minimal lesion NS (MCD, lipoid nephrosis)
- Focal segmental glomerulosclerosis (FSGS)
- Mesangiocapillary GN (MCGN, MPGN)
- Membranous nephropathy

Secondary (5%)
- Complication / part of
- Systemic disease (Vasculitis/SLE/HSP etc.)
- Drugs
- Infections etc.

Indications for kidney biopsy:

- Secondary N.S (Hematuria/significant proteinuria)
- Frequent relapsing N.S
- Steroid resistant N.S
- Hypertension.
- Low GFR / RPGN

Management

- **based on the cause**

Nephrotic Syndrome	✓ *Admission* ✓ Family Education: Diet, Steroid SE, .. ✓ *Albumin + Lasix (Diuretics), thiazide* ✓ Vaccination: PCV 13 ✓ Anticoagulation in children with thromboembolic events ✓ *Steroids* (oral, IV bolus) ✓ Immunosuppresives: Cyclophosphamide. Mycophenolate ✓ *Anti-platelet: Aspirin* ✓ *ACEI/ARBS*

Approach to Acute/Chronic (recurrent) Cough

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (cough <3 week duration), and duration?
- ***Previous episodes***

- ***Describe***:

- Character: productive or not, with blood or not (amount, color, blood)
- Severity
- continuous/intermittent
- bouts of cough (episodic)

DDx	Questions
URTI	fever, headache, facial pain, nasal congestion & discharge, sore throat, hoarseness of voice, chest pain
Hx	Hx of respiratory infection/exposure
Tuberculosis (TB)	night sweat, weight loss, elderly in the house, contact with a TB
Vaccines	PCV-13, HiB, BCG
Allergy	allergy to drugs, season, weather, food, eczema, rash, pets, smoking, well ventilated house
FHx	FHx of asthma, atopy
Cardiac	cyanosis, shortness of breath (SOB), exertional dyspnea, Hx
GERD & TEF	recurrent vomiting
Respiratory	Cough worse at night, wheezes
Consanguinity	
Foreign Body	Did he swallow anything, last seen
Cystic fibrosis	recurrent chest infection, abdominal distention, diarrhea, FTT, FHx
Immunodeficiency	recurrent skin and OM, recurrent hospital admissions
Pre-natal	premature, birth weight, delayed meconium passage, jaundice, NICU

Physical Examination

- ***General look***, ***Vital Signs***, ***Growth parameters***
- ***Signs of respiratory distress***: nasal flaring, retractions, rapid breathing, grunting and tachypnea

Acute Cough Physical Examination	
Organ	**What to look for**
Eye	Redness, Cyanosis
Nose	Nasal polyps, allergic sallute
Chest	- *Inspection*: deformities (scoliosis, pectus craniatum, excavatum), scars, masses, visible pulsations - *Palpation*: tracheal deviation, masses, tenderness, chest expansion, tactile vocal fremitus - *Percussion*: on both sides - *Auscultation*: breathing sounds, air entry, added sounds
Hands	clubbing
Skin	Rash (signs of atopy)
ENT	Full ENT exam

Chronic Cough Physical Examination	
Organ	**What to look for**
Face	Dysmorphic features
Eye	allergic shiners
Autoscopy	for foreign body (autogenic reflux), otorrhea with tympanic membrane, scaring (primary ciliary dyskinesia PCD)
Nose	nasal salute (behavioral rubbing of the nose), anterior rhinoscopy (look for polyps), hypertrophied turbinates, check the mucosa
Mouth	mouth breathing, hypertrophied tonsils
Neck	lymph nodes malignancy
Hand	clubbing, cyanosis
Cardiac	dextrocardia, murmurs (for primary ciliary dyskinesia (PCD)
Respiratory	Full respiratory examination!
Abdomen	distention, organomegally
PR Exam	rectal polyps
Lower limp	Edema

Investigations

Dx	Test
Infections	✓ CBC, ESR, CRP ✓ Sputum & Blood culture
Asthma	✓ Spirometry ✓ Skin prick test ✓ Other: peak flow, methacholine, histamine, exercise challenge tests, sputum eosinophils, IgE, Eosinophils
TB	✓ TST, PPD, PCR ✓ Interferon-gamma release assay (IGRA) ✓ Ziehl-neelsen stain for sputum
CF	✓ Sweat chloride test, Fecal Elastase, Gene testing
Foreign body	✓ Bronchoscopy
Cardiac	✓ Echo, ECG
GERD	✓ Esophageal pH monitoring & upper endoscopy
Other	✓ Electrolytes, ABG's, **CXR (AP/L)**

Management

Dx	Mx
Bronchiolitis	• Supportive • Oxygen, cpap, intubation • IV fluid if unable to take PO or too tachypnic (RR > 60b/min) • Bronchodilators Albuterol and epinephrine may help • Steroids are not recommended in previously healthy children • Hypertonic saline not routinely recommended
Asthma	**Acute asthma management:** • Inhaled albuterol, continuo us, frequent • Systemic steroids---- Oral or IV • Inhaled anticholinergics • If no improvement consider – Subcutaneous terbutaline – Magnesium sulphate – Heliox – Intubation and ventilation

Cystic Fibrosis	• Airway clearance • Disease modifying therapies: Ivacaftor for class 3 mutation • Ibuprofen • Azithromycin • Steroids: not routinely indicated • Pancreatic enzyme replacement therapy • Fat soluble & AKED vitamins • Manage the complications
Pneumonia	• Oxygen • IV fluids if unable to do PO feeds • Antibiotics: - Newborns: ampicillin gentamicin or ceftazidime - Older children: ampicillin or ampicillin clavulanic acid, in severe cases 3rd generation cephalosporins - If older than 5 and mycoplasma suspected: macrolides can be used • If patient is toxic looking add vancomycin

Approach to Vomiting
History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (vomiting), and duration?
- ***Previous episodes***

- ***Describe***:

- frequency
- color, amount, blood
- projectile/not
- related to food or not

Think of the Dx in these scenario's:

A. Vomiting + Headache:
- Meningitis

B. Vomiting + Diarrhea:
- Gastroenteritis (GE)

C. Vomiting in neonate:
- Biliary Atresia (BA)

DDx	Questions
Meningitis	headache, photophobia, neck pain, rash
Otitis media	discharge, ear pain
URTI	cough, nasal congestion, sore throat
Gastroenteritis (GE)	fever, abdominal pain, diarrhea, did they get exposed to a similar case, eating outside (junk food), or drank unclean water
UTI	dysuria, frequency, urgency, flank pain, loin pain, incontinence, red urine, oliguria
↑ ICP	chronic headache, mainly upon wakening, seizures, focal weakness, altered personality and behavior
DKA	FHx, altered mental status, dehydation
GERD	dysphagia, odynophagia, heartburn, hoarseness of voice
Hepatobiliary	jaundice, fatigue, anorexia, dark urine, itching, blood in stool, exposed to hepatitis patients
Intestinal Obstruction	abdominal distention, constipation - **Think of biliary atresia if neonate!**
Trauma	To the head
Drugs	

Physical Examination

- ***General look***
- ***Vital Signs***
- ***Growth parameters***
- ***Dehydration status:*** sunken eyes, dry mucus membrane, skin turgid >15 sec, capillary refill > 2 sec

Organ	What to look for
Eye	jaundice, pallor, conjunctivitis, uveitis (for inflammatory bowel disease), ***fundoscopy for papilledema***
Ear	otitis media
Mouth	ulcers, dental erosions
Lung	auscultation
Abdomen	- *Inspection*: distention & visible bowel loops (obstruction), dilated veins - *palpation*/*percussion*: superficial/deep, costovertebral angle tenderness, organomegally, shifting dullness, transmitted thrills
Genitalia	hernia
PR Exam	
Lower Limp	arthritis (Familial Mediterranean fever FMF, HSP), edema, rash
Neurological	Meningeal signs, Cranial nerves, tendon, Babinski, clonus, cerebellar and mental status

Investigations

Test	What to look for
CBC	Signs of inflammation
XRAY	Abdomen, Chest
US	
LP	For elevated ICP
Electrolytes	
Glucose check	
LFT, KFT	
Endoscopy	For GERD

Approach to Chronic Diarrhea

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (chronic diarrhea), and duration?
- ***Previous episodes***

- ***Describe***:

- *frequency*
- *stool character*: color, amount, blood, odor, mucus, greasy, foul smelling
- *constant*/*intermittent*
- *progression*

DDx	Questions
Malabsorbtion	abdominal distention, weight loss, failure to thrive FTT
Diet	is he given food now
Cow milk allergy	type of feeding, dietary products, rash, vomiting
Celiac	does he consumes wheat & its products, pallor, FHx of celiac
Cystic fibrosis	delayed passage of meconium, recurrent chest infection, CF FHx
Consanguinity	
Protein Loosing	edema, muscle wasting, hair loss
IBD	eye redness, inflammation, oral ulcers, arthritis, FHx of IBD
IBS	does diarrhea alternate with constipation
Giardiasis	water source
Immunodeficiency	recurrent skin infection, otitis media, FHx
Hepatobiliary	jaundice, dark urine, pruritus (itching), Hx of liver disease
Pancreatitis	Steatorrhea
Allergic enteropathy	allergic to food, drug, rash, asthma, spring allergy
Hyperthyrodism	head intolerance, sweating, hyperactivity, anxiety, palpitation
Fruit juice	does he consumes allot of juices
Toddler	does the diarrhea become worse and more watery at night
Travel Hx	Traveler’s diarrhea
Drug	laxatives

Physical Examination

- ***General look***, ***Vital Signs***, ***Growth parameters***
- ***Signs of dehydration***: sunken eyes, dry mucus membrane, skin turgid >15 sec, capillary refill > 2 sec

Organ	What to look for
Eye	pallor, jaundice, redness, exophthalmos, led lag, conjunctivitis, uveitis
mouth	teeth problems, Aphthous stomatitis, oral ulcers
Neck	Lymph nodes and thyroid
Chest	auscultation
Abdomen	- *Inspection*: mainly distention - *palpation*: organomegally, liver span, transmitted thrills - *percussion* shifting dullness - *auscultation*
PR	rectal prolapse, anal fissures, tags, sphincter tone
Lower limb	sweaty, tremor
Hand	edema
Skin	rash, bruises

Investigations

Test	What to look for
CBC	(Anemia, Lymphopenia, Thrombocytosis, Protein loosing enteropathy (Reactive)), Anemia: IDA, B12, folate, chronic
Allergy	**Skin prick test, specific IgE levels**
ESR	Immune deficiency
If Celiac	Anti-TTG, Total IgA
Albumin	If edema is found
EMA, HLA (DQ2,8)	
Stool culture	ova, parasites, C.difficile, pH, occult blood
Reducing substances	fecal hydrolysis for non-reducing carb
Fecal elastase, Alpha 1 antitrypsin	For pancreatic insufficiency
Sweat chloride test	
Endoscopy with biopsy	For Celiac, Lymphangiectasia

Management

- **based on the cause**

Celiac Disease	✓ lifelong strict adherence to a gluten-free diet. This requires a wheat-, barley-, and rye-free diet. ✓ Periodic measurements of TG2 antibody levels to document reduction in antibody titers can be helpful as indirect evidence of adherence to a gluten-free diet

Name the histological changes in each:

A. Celiac:

- Villi to crypt ratio 3:1
- Flattening of the villi
- Lymphocyte infiltration

B. Lymphogiectasia:

- variable degree of lymphatic dilatation in mucosa/submucosa

Approach to Headache

History

- ***Patient profile*** (age, name)
- ***Chief Complain*** (headache), and duration?
- ***Previous episodes***

- ***Describe***:

- *SOCRATES: frequency, site exactly*, *constant*/*intermittent, progression*
- *Associated with fever or not*

DDx	Questions
Trauma	
Tension	Any stressful event, usage of phone frequently
Migraine	FHx, nausea, vomiting, photophobia, aura
Cluster	Localized to one eye, very severe headache
Meningitis	headache, photophobia, neck pain, rash
Sinusitis	Nasal discharge, cheek bone pain
↑ ICP	Vomiting, chronic headache, mainly upon wakening, seizures, focal weakness, altered personality and behavior
Drugs	
Abdomen	Any change in the bowel habits

Physical Examination

- ***General look***, ***Vital Signs***, ***Growth parameters***

Organ	What to look for
Eye	Fundoscopy for papilledema
Ear	Discharge, inflammation
Mouth	teeth problems, tooth decay
Neurological	- *Meningeal signs*: nuchal rigidity, Brudizinski, Kernigs sign - *Cerebellar signs* - *Cranial nerve examination* (*CN*) - *Muscle tone*, *reflexes*, *clonus*, *Babinski* sign

Investigations

Test	What to look for
CBC	
Head imaging	
LP	For meningitis

Management

- **based on the cause**