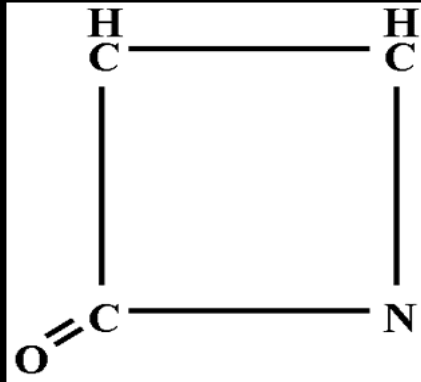




| Antibiotics | Endocrine | Hematology | Oncology | Peds In Review |
|--------------|--------------|--------------|--------------|----------------|
| <u>\$100</u> | <u>\$100</u> | <u>\$100</u> | <u>\$100</u> | <u>\$100</u> |
| <u>\$200</u> | <u>\$200</u> | <u>\$200</u> | <u>\$200</u> | <u>\$200</u> |
| <u>\$300</u> | <u>\$300</u> | <u>\$300</u> | <u>\$300</u> | <u>\$300</u> |
| <u>\$400</u> | <u>\$400</u> | <u>\$400</u> | <u>\$400</u> | <u>\$400</u> |
| <u>\$500</u> | <u>\$500</u> | <u>\$500</u> | <u>\$500</u> | <u>\$500</u> |

Antibiotics \$100

I am a



Answer?



\$100

What is B-lactam ring

- B-lactams.....
- Introduced in the 1940s
- Inhibit cell wall transpeptidase (aka penicillin binding protein), peptidoglycan cross-linking is inhibited
- Bactericidal
- Widely distributed
- Wide therapeutic window
- Adverse effects: hypersensitivity, interstitial nephritis, seizures
- β -lactam basic structure is modifiable
- Resistance is a problem



Antibiotics \$200

Name four mechanisms of B-lactam resistance

Answer?



\$200

1. β -lactamases
 - cleaves β -lactam ring
 - Ex.: Staphylococcal penicillinase
 - Some gram-negatives
2. Altered Penicillin-Binding Proteins
 - β -lactam has reduced affinity
 - Ex: *S. pneumoniae*, *E. faecalis*
3. Altered porin channels
 - prevent β -lactams from entering outer cell membrane
 - Some gram neg orgs
4. Efflux pumps



Antibiotics \$300

I am...

- Bactericidal
- Active against gram-negative enterics, *Pseudomonas*
- Can also have some synergistic activity against gram positives, when used with β -lactams, e.g. *Enterococcus*
- Anaerobes intrinsically resistant
- Poor CNS penetration
- Parenteral, inhaled, topical
- Narrow therapeutic window: nephrotoxicity, ototoxicity

Answer?



\$300

• What are aminoglycosides?

- Gentamicin, tobramycin, amikacin, neomycin, Streptomycin (for TB only)
- Concentration dependent, post-antibiotic effect (residual bactericidal activity present after the serum concentration has fallen below the MIC, low resistance after all these years)
- Anaerobes: because oxygen-dependent transport process required for entry
- Poor tissue penetration, acidic environments e.g. abscesses, decreased entry into bacterial cells



Antibiotics \$400

Name that antibiotic...

- Inhibitor of RNA polymerase
- Broad coverage, including mycobacteria
- Well absorbed and distributed, good for infections associated with prosthetic devices
- Rapid development of resistance
- Only use by itself for prophylaxis
- Parenteral and oral
- Drug interactions
- Stains secretions orange, nausea, hepatotoxicity

Answer?



\$400

What is Rifampin?



Antibiotics \$500

3 antibiotics that can be used for the treatment of infections with “atypical” bacteria

Answer?



\$500

What are

1. Azithromycin/ Macrolides
2. Fluoroquinolones
3. Tetracyclines



Endocrine \$100

Polyuria, polyphagia, polydipsia

Answer?



\$100

- What are some presenting signs of diabetes mellitus?
 - Other signs:
 - Weight loss
 - Malaise
 - Headache
 - Weakness
 - Candidiasis
 - Recurrent infections
 - If in DKA:
 - Altered mental status
 - Vomiting
 - Abdominal pain
 - Severe dehydration
 - Fruity odor (ketones)
 - Blurry vision
 - Kussmaul respirations



Daily Double!

This cause of primary adrenal insufficiency results in Ambiguous genitalia in boys, lack of puberty in both sexes, hypertension

Answer?



Daily Double

What is Congenital Adrenal Hyperplasia?

- Group of autosomal recessive disorders with enzyme deficiencies resulting in abnormal cortisol and/or aldosterone production
- Most common is 21-hydroxylase deficiency
 - 3 phenotypes
 - Classic: adrenal insufficiency in infancy +/- salt wasting and/or virilization
 - Simple virilizing
 - Nonclassic
 - Females usually present at birth w/ ambiguous genitalia
 - Males usually present later with adrenal crisis
 - But this is one of the things on the MD newborn screen! So we can often catch these kids before they get sick



Daily Double

- Genetic disorders leading to adrenal insufficiency
 - Congenital adrenal hyperplasia:
 - 21-Hydroxylase **deficiency**: Ambiguous genitalia in girls
 - 11 β -**Hydroxylase deficiency**: Ambiguous genitalia in girls and hypertension;
 - 3 β -HSD type 2 **deficiency**: Ambiguous genitalia in boys, postnatal virilization in girls
 - **17 α -Hydroxylase deficiency**: Ambiguous genitalia in boys, lack of puberty in both sexes, hypertension
CYP17 mutation



Daily Double

- Patients with 17-hydroxylase deficiency cannot synthesize cortisol, but their ability to synthesize corticosterone is intact. Because corticosterone is an active glucocorticoid, patients do not develop adrenal insufficiency.
- Deoxycorticosterone, the immediate precursor of corticosterone, is synthesized in excess. This can cause hypertension, hypokalemia, and suppression of renin and aldosterone secretion, as occurs in 11-hydroxylase deficiency. However, in contrast to 11-hydroxylase deficiency, patients with 17-hydroxylase deficiency are unable to synthesize sex hormones.



Endocrine \$300

This acute, life-threatening, hypermetabolic state presents with fever, tachycardia, hypertension, neurologic abnormalities, and GI symptoms

Answer?



\$300

What is thyroid storm?

- Thyroid storm is the most severe manifestation of thyrotoxicosis
- Many etiologies; most common is Graves disease in pediatric population
- Rare



Endocrine \$400

According to legend, a gypsy woman traveling with her thirsty son is denied water by a housewife. The gypsy woman curses the housewife, causing the housewife's sons to crave water while condemning her daughters to pass this curse on to future generations.

Answer?



Endocrine \$400

What is nephrogenic diabetes insipidus?

- X-linked, vasopressin V2 receptor deficiency, locus Xq28
 - defective or absent receptor sites at the cortical collecting duct segment of the nephron
- autosomal recessive, locus 12q13
 - defective or absent aquaporin, the protein that transports water at the collecting duct
- X-linked variety of nephrogenic diabetes insipidus (NDI) accounts for about 90%

Answer?



Endocrine \$500

These tumors comprise the various subtypes of multiple endocrine neoplasia

(name each subtype and at least two associated tumors)

Answer?



\$500

What are 1, 2A, and 2B?

- MEN 1 (*MENIN* tumor suppressor gene on chromosome 11)
 - hyperfunctioning tumors in all 4 parathyroid glands, pancreatic islets (eg, gastrinoma, insulinoma, glucagonoma, vasoactive intestinal peptide tumor [VIPoma], pancreatic polypeptide-producing tumor [PPoma]), and the anterior pituitary (eg, prolactinoma, somatotropinoma, corticotropinoma, nonfunctioning tumors). Other associated tumors include lipomas, angiofibromas, or those located in the adrenal gland cortex (rarely, in the adrenal medulla)
- MEN 2A (*RET* proto-oncogene)
 - medullary thyroid carcinoma (MTC), pheochromocytoma (about 50% of cases), and hyperparathyroidism caused by parathyroid gland hyperplasia (about 20% of cases)
- MEN 2B
 - medullary thyroid cancer and pheochromocytoma. Associated abnormalities include mucosal neuromas, medullated corneal nerve fibers, and marfanoid habitus



Hematology \$100

Iron Deficiency,
Thalassemia,
Hyperplumbism,
Hemoglobinopathies

Answer?



\$100

What are Microcytic Anemias?

Defect in hemoglobin production during
erythrocyte maturation resulting in “smaller”
cells



Hematology? \$200

Hemoglobin and Hematocrit values above the normal range usually in response to decreased oxygen delivery

Answer?



\$200

What is Polycythemia?

- Primary (polycythemia vera) = increased total red cell mass
 - Secondary = usually due to hypoxia or decreased blood delivery to kidneys



Hematology \$300

X-linked disorder involving bleeding into joints, muscles and soft tissues

Answer?



\$300

What is
Hemophilia?

Hemophilia A = Factor VIII
deficiency

Hemophilia B = Factor IX deficiency
(aka Christmas disease)



Hematology? \$400

Two causes of Disseminated
Intravascular Coagulation

Answer?



\$400

What are infection, trauma,
malignancy, toxin, vasculitis,
obstetric complications,
cardiopulmonary disorders,
hypercoagulability and idiopathic
causes?



Hematology? \$500

Three congenital disorders
with neutropenia

Answer?



\$500

What are
Kostmann's syndrome, cyclic neutropenia,
Shwachman-Diamond syndrome, familial
benign neutropenia, Fanconi's anemia,
reticular dysgenesis, myelokathexis,
dyskeratosis congenita, Cartilage-Hair
syndrome, Chediak-Higashi syndrome, X-
linked agammaglobulinemia, Hyper-IgM
syndrome?



Oncology \$100

These 3 drugs are among the most common anti-emetics used for patients receiving IV chemotherapy

Answer?



\$100

What are ondansetron, promethazine, metoclopramide, lorazepam, dexamethasone, methylprednisolone

Others: cannabinoids, other 5-HT receptor antagonists, other phenothiazines



Oncology \$200

Sclerotic destruction and “sunburst” pattern are characteristic radiographic findings for this type of tumor

Answer?



\$200

What is osteosarcoma?

vs. Ewing sarcoma, which has primarily lytic lesions with “onion skinning” on plain radiographs



Oncology \$300

This classic metabolic triad can result in renal failure

(name the 3 metabolic derangements and the name of the overall syndrome)

Answer?



\$300

What is tumor lysis syndrome?

1. Hyperuricemia
2. Hyperkalemia
3. Hyperphosphatemia

Rapid release of intracellular contents into the bloodstream and is most likely to occur in the setting of large tumor burden, rapid cell turnover, and a rapid tumoral response to therapy

Can be seen with hematologic malignancies before or after initiation of chemo, and with some solid tumors after initiation of chemo; can also result in hypocalcemia

Prevented by treating with allopurinol and hydration; treated with hydration and rasburicase



Daily Double

These are three of the most frequently-encountered serious side effects of stem

cell transplant
Daily Double!

Answer?



Daily Double

What are graft vs. host disease, CMV infection, and veno-occlusive disease, mucositis, hemorrhagic cystitis, TRLI

Other common late side effects:

- Immunodeficiency - 50-100%
- Renal dysfunction - More than 50%
- Cataracts - 20-50%
- Chronic GVHD - 20-50%
- Endocrine dysfunction - 20-50%
- Infertility - 20-50%
- Delayed sexual development - 20-50%
- Oral and dental problems - 20-50%
- Psychosocial stress - 10-30%
- Secondary malignant neoplasms - Less than 20%
- Cognitive disorders - Less than 20%
- Avascular necrosis of the hips and other joints - Less than 20%
- Ventilatory dysfunction - Less than 20%



Oncology \$500

The following are the 3 main diagnostic criteria for this syndrome:

1. A proband diagnosed with sarcoma when younger than 45 years
2. A first-degree relative with any cancer diagnosed when younger than 45 years
3. Another first-degree or second-degree relative of the same genetic lineage with any cancer diagnosed when younger than 45 years or sarcoma diagnosed at any age

Answer?



\$500

What is Li-Fraumeni Syndrome
(linked to germline mutations of *p53* tumor suppressor gene)



Peds In Review \$100

Use of this drug class during pregnancy results in a floppy baby, hypoventilation, irritability, hypertonicity, and increased risk of LBW and preterm delivery

Answer?



\$100

What are benzodiazepines?



Peds In Review \$200

This scale is the most commonly used to evaluate opioid related NAS every 3-4 hours and is weighted on 31 items.

For extra points, give example of the tested items

Answer?



\$200

What is the Finnegan scale?

Examples: Tonal problems, tachypnea, feeding and sleeping problems, fever, and seizures



Peds In Review \$300

Signs and symptoms include arthritis, osteopenia, aphthous ulcers, episcleritis, primary sclerosing cholangitis, growth failure, pubertal delay, thromboembolism, pancreatitis, and peripheral neuropathy.

Answer?



\$300

What are extraintestinal manifestations of inflammatory bowel disease?



Peds In Review \$400

This infection can mimic the clinical, radiographic, and endoscopic features of Crohn disease

Answer?



\$400

What is intestinal tuberculosis?



Peds In Review \$500

This is a major cause of cataract associated blindness

Answer?



\$500

What is deprivation amblyopia?



FINAL JEOPARDY

CATEGORY: What You Didn't Know

FINAL JEOPARDY

This condition, which is inherited in this fashion, is one of the few indications for immediate cessation of breastfeeding and for feeding lactose-free formula to neonates

Answer?



FINAL JEOPARDY ANSWER

What is galactosemia?

