

## 1. ORGANOPHOSPHATE POISONING

A 55 yr old crop duster calls because he has lost control over his chronic twitch, and he is now beginning to have problems with blurry vision and control of his bowels and bladder. He wants to go back to the airfield to finish his crop dusting, but his supervisor makes him call you first.

[AChE poisoning, signs]  
[Treatment]  
[Selective toxicity of insecticides]

## 2. ANTICOAGULATION

A 50 yr old female is chronically taking warfarin because of a prosthetic mitral valve which was inserted at age 38. Her dose has been stable for many years, and her prothrombin time is usually 5-6 seconds over control (INR 2.9). Three weeks ago, a routine chest X-ray suggested possible tuberculosis. A PPD was positive, so treatment was started with rifampin and isoniazid. This evening she collapsed suddenly at home, and you are called to see her in the Emergency Ward. She is comatose, and a CAT scan shows a large cerebral infarct. INR is 1.2.

[Anticoagulant effects, monitoring]  
[Drug interaction, enzyme induction]

## 3. ULCERATIVE COLITIS AND SULFASALAZINE

You are called to consult on a 20 yr old female for management of recently diagnosed ulcerative colitis. One month prior to admission the patient noted bloody diarrhea and crampy abdominal pain. Proctosigmoidoscopy now reveals diffuse edema, friability and ulcerations consistent with acute ulcerative colitis. Barium enema is normal. You prescribe 1 gram of sulfasalazine po qid and hydrocortisone 100 mg as retention enema bid. Over the next two weeks she improves steadily with complete normalization of her bowel pattern.

Two months later you are called again because she was admitted with the sudden onset of weakness, dizziness, chills, abdominal pain and fever. The fever has persisted despite intravenous fluids, antibiotics and systemic steroids and she has now developed a rash and mild jaundice.

[Bacterial biotransformation]  
[Pro-drugs]  
[Acetylator phenotype]

#### 4. PHEOCHROMOCYTOMA

A 29 yr old female presents to your clinic with a 2 yr. history of headaches, perspiration, chest pain, increased urination and chest pain. Lately, she has been having problems eating because of trouble swallowing and intermittent crampy abdominal pain. Your initial diagnosis of cholelithiasis is further supported by abnormal liver function tests, and you send her for an abdominal ultrasound. When the radiologist presses the transducer up against the right upper quadrant to better visualize a grapefruit-size mass, all of the symptoms the patient has ever experienced present in force. A blood pressure of 250/140 is recorded, and you are voice-paged STAT to the radiology suite. When you arrive, the patient and radiologist are both flushed, diaphoretic and quite uncomfortable; they both look to you for relief.

[Diagnosis]

[Pathophysiology]

[Rx - Acute and Long-term]

#### 5. ASTHMA

A patient comes to you in the Medical Walk-In Unit suffering from poorly controlled asthma. He claims that despite regular use of oral theophylline and an albuterol inhaler he is still markedly short of breath. His brother recently left on vacation and left his two dogs with him. Your patient finds that his symptoms are made even worse, or may be brought on from a quiescent state, if he takes the dogs out for a run through the snow. More importantly, he is concerned because his heart is pounding. In between gasps and wheezes he asks you what to do now, and if there is anything you can give him that won't make his heart beat so fast.

[Pathophysiology]

[Rx Options: Acute treatment vs Chronic Prophylaxis]

## 6. POISON CONTROL

You are working the telephone hotline at the Poison Control Center, and your supervisor asks you to review the phone log from the previous 24 hr.

- a. A 35 yr old man presented to the local EW from his laboratory where he had been working on an enzyme immobilization requiring the use of cyanide. His laboratory technician bumped his arm, and he complained that he felt faint and thought he could taste almonds.
- b. The Children's Hospital called because a 2 yr. old boy was brought in after probable ingestion of anti-freeze.
- c. Children's Hospital called again because a 4 yr. old girl ingested a bottle of her grandfather's digoxin tablets. She was having a substantial number of premature ventricular contractions.
- d. A physician from a local hospital called about a man with abdominal pain, headache and memory loss. He had been admitted with ataxia, a peripheral neuropathy, microcytic hypochromic anemia, and azotemia. Since he is a painter, there was some concern that he was suffering from lead toxicity. He is ultimately found to have an elevated free erythrocyte protoporphyrin level.

## 7. COCAINE - MI

You are the emergency room doctor when a 19 yr. old female is brought in semi-comatose. An unidentified young man accompanies her and says that he was giving her a ride home when she asked to stop at a friend's house. He waited 20 minutes, and when she returned to the car she was acting funny. He brought her to the EW where she passed out. On physical exam she is diaphoretic and responds only to deep sternal rub. Blood pressure is 280/160 and heart rate is 190. Her lungs are markedly bronchospastic with poor air movement peripherally and central wheezes. You think you hear a gallop in addition to her normal heart sounds. The ECG shows evidence for a large evolving myocardial infarction.

[Cocaine effects on the heart]

[Rx cocaine toxicity]

## 8. GLAUCOMA

Mr. S presents to you with diminished peripheral vision. He complains that he feels like the world is closing in on him. He also notes that he has trouble looking at lights as they all appear to be surrounded by halos. You perform fundoscopic and gonioscopic exam with tonometry and diagnose glaucoma.

Mrs. P is a 65 yr. old female who has become acutely ill in the waiting room. An ophthalmologic assistant had dilated her eyes in preparation for examination. She is now complaining of nausea, diaphoresis and pain in her right eye, which is now red and swollen.

[Open vs. closed angle glaucoma]

[Appropriate drug rx in each case, rationale]

## 9. PHARMACOGENETICS

A 59 year old male with stable angina was given a prescription for metoprolol. After the first four doses he felt faint. His wife—a nurse—found that his heart rate was only 32. The cardiologist is surprised at his sensitivity, since the dose was not large. The patient figured he was actually pretty resistant to drugs, since the codeine he took last week for his sprained ankle didn't do a thing for his pain.

[Debrisoquin/sparteine polymorphism – diagnosis, implications]

## 10. HYPERTHYROIDISM

Your patient is a 35 year old woman who complains of increasing nervousness, palpitations, sweating, and tremors over the last four weeks. She has been having diarrhea and lost 5-10 lb. On examination, she has moderate exophthalmos and a diffusely enlarged, asymmetric thyroid gland with an audible bruit. ECG shows sinus tachycardia of 115 bpm with frequent atrial premature contractions. You make a presumptive diagnosis of Grave's Disease and obtain laboratory tests which confirm elevations in serum T4 and T3 with undetectable TSH. Her symptoms respond after treatment is started with propranolol, potassium iodide, dexamethasone, and propylthiouracil.

[Graves Disease pathophysiology and diagnosis]

[Thyrotoxicosis treatment: immediate, long-term]

## 11. PLACENTAL TRANSFER

You are asked to consult on a 38 y.o. G<sub>1</sub>P<sub>0</sub> female who is 6 weeks pregnant. She has multiple medical problems, including rheumatoid arthritis, hypothyroidism, and a seizure disorder. These problems have been controlled with corticosteroids, synthroid, and phenytoin. The patient wishes to carry her baby to term but is very concerned about the medications she takes and whether they will cause damage to the fetus.

[Maternal-fetal drug transfer]

[Teratogenesis]

## 12. GOUT

Mr. Jones is a portly 65 yr old man who presents with a painful, inflamed big toe. He is president of the largest meat packing house in the Midwest and has been in good health for years except for hypertension which is well-controlled on hydrochlorothiazide. You make the diagnosis of acute inflammatory gouty arthritis, advise him to stay off his feet, and prescribe colchicine 0.6 mg every 1-2 hours. He responds to this and seeks your advice for preventive measures.

[Mechanism of gout, effects of diet and diuretic]

[Effects and toxicity of colchicine, alternative rx]

[Chronic rx alternatives]

## 13. ANALGESIA -- PLACEBO RESPONSE

Mr. S. is a very demanding postoperative patient. He complains constantly about his room, his roommate, the nurses, and the housestaff. It has been five days since his hip fracture was repaired, but he still complains of severe, poorly localized leg pain. The exasperated senior resident is convinced that nothing is wrong. She tells Mr. S. that she will order medicine which is "much more effective," then asks the nurse to give an i.m. injection of 2 ml of normal saline. About 30 minutes later, Mr. S. says his pain is "nearly gone." Do you think Mr. S. is a "crook?" Do you think that this treatment was ethical?

## 14. GERIATRIC PHARMACOLOGY

Mrs. G., a 75 year old living independently, was evaluated for abdominal pain, fatigue and dark stools. Endoscopy showed a bleeding duodenal ulcer. She was given a prescription for omeprazole and scheduled for a repeat endoscopy in 2 months. Four weeks after the initial visit, she was brought to an emergency room vomiting blood. She said she had stopped her medication after one week because the pain had resolved.

Mr. H. is an 81 year-old gentleman who has recently moved to an assisted-living facility and complained that he couldn't sleep. He was given a prescription for flurazepam. Four days later he fell in the bathroom and fractured his hip.

[Geriatric pharmacology –compliance, kinetics, dynamics]

## 15. ANTIEMETICS

A 46 year old woman is receiving cis-platinum chemotherapy for an advanced malignancy. In order to prevent intense nausea and vomiting, she is given lorazepam and large doses of ondansetron. She asks the oncologist if marijuana is also effective treatment for this.

A 17 year woman with viral gastroenteritis received prochlorperazine to treat nausea. Two hours later she has developed painful stiffness in her neck and is unable to keep her head from turning to the side. Her tongue feels swollen, and she has trouble keeping it in her mouth.

[Antiemetics – classes and mechanisms of action]  
[Drug induced dystonia]

## 16. ACUTE RENAL FAILURE

A 70 yr old man is chronically taking digoxin for atrial fibrillation. He was brought to the hospital 2 days ago hypotensive and septic due to high grade bladder outlet obstruction. Despite resuscitation with fluids, pressors and antibiotics he is now making only 5-10 ml of urine per hour. His initial bacterial culture showed pseudomonas sensitive to gentamicin. How will you handle his digoxin and gentamicin therapy in the face of his acute renal shutdown? What information will you need?

[Dosage adjustment in renal failure]

## 17. LITHIUM TOXICITY

Your manic depressive patient has been taken to the local emergency room by his wife. She says that while he has always been tremulous he now cannot control the motion of his limbs. While he has always been thirsty and had a bit of a prostate problem, he now drinks and urinates all day long. She also notes that he has not been manic for days and is very sleepy, slow in thought, and dysarthric. She cannot understand this steady worsening, since he has been stable on lithium treatment for several years. One month ago, his internist had checked his lithium level and found it to be 1.1 (the upper limit of normal). He was also found to be mildly hypertensive, so he was started on a diuretic.

[Lithium/ mechanism, indications]  
[Toxicity, drug interaction]

## 18. ALCOHOL

The treasurer of a large insurance company is admitted to your service with an upper gastrointestinal bleed. On the second hospital day the nurses note that he is becoming agitated and tremulous. He is sweaty, tachycardic, tachypneic, febrile, and clearly in distress. Very soon thereafter he becomes frankly confused and hallucinatory.

After appropriate care and recuperation he is ready to return to work. He asks that you help him abstain from drinking and recalls that a friend told him the drug Antabuse (disulfiram) would make him sick if he drinks. Can you explain to his satisfaction how this works and what precautions must be taken?

[Alcohol effects]  
[Acute alcohol withdrawal]  
[Chronic treatment]

## 19. ALLERGY

You are working in the dental clinic when you get an urgent call from one of the first year dental students. A young woman with mitral valve prolapse received a prophylactic dose of intravenous penicillin prior to root canal work. You find the patient to be flushed and incoherent, with a thready pulse and poorly appreciated blood pressure.

[Anaphylaxis; mechanism, rx.]  
[penicillin allergy]

A 50 yr. old man is placed on procainamide for ventricular ectopic rhythms. He presents in your office 10 days later with joint pain and shortness of breath. Serologic examination reveals antinuclear antibodies present at the highest dilution. Chest X-ray shows bilateral pleural effusions.

[Drug induced lupus]

## 20. MIGRAINE

Your patient is a 28 year old female who has been referred for evaluation in the Headache Clinic. Her problem began 10 years ago when she began having throbbing unilateral headaches with nausea, usually preceded by visual disturbances. Her internist initially prescribed ergotamine tablets, and later switched her to oral sumatriptan. These drugs have been able to abort some of her attacks. She is concerned because she is now having 3 –4 severe headaches per month, and she has missed 5 days of work in the last 3 months.

[Migraine pathophysiology]  
[Treatments: abortive vs. prophylactic vs. rescue]

## 21. FOLATE

A 60 yr old male with a long history of heavy drinking sees you in clinic. Four months ago another physician told him he had an ulcer. He still has abdominal pain, but now he also complains of a painful tongue, sore mouth, and trouble walking. He attributes some of his weakness to all the diarrhea he is having. The patient's wife is impressed that her cousin had the same symptoms when he was receiving chemotherapy for his lymphoma.

[Folate absorption and malabsorption]  
[Action in cancer, leucovorin "rescue"]  
[Action in antibacterial drugs]



## 22. ORAL HYPOGLYCEMICS

A 29 yr old male who works at your clinic believes he has diabetes mellitus. His father and paternal grandfather both developed this disease late in life. He has polyuria, polydipsia and polyphagia accompanied by weakness, weight loss and blurry vision. You test his urine and find 3+ glycosuria; blood glucose is 450 mg/dl. The patient does not want to take insulin and hopes that pills will be enough. On the other hand, he has heard that oral hypoglycemics can be bad for you.

[Oral hypoglycemics, mechanisms]  
[Toxicity]

## 23. ANALGESIA -- TERMINAL CANCER

You are on the Oncology Pain Service and asked to consult on a 51 year old female who is suffering from breast cancer metastatic to liver and bone. She has painful metastatic lesions in two ribs which make it difficult to breathe deeply. She also had a recent pathologic fracture from a metastasis in her right humerus. Her local doctor prescribed codeine initially, but she told him she needed something stronger. She has been taking 1-2 Percocet<sup>®</sup> (acetaminophen-oxycodone), every 4-6 hours for the last three weeks, but these give her adequate pain relief for only about an hour. You add ibuprofen 400 mg every 4 hours, and the pain becomes "tolerable."

[analgesia in terminal cancer]  
[analgesic drug interaction]  
[opioid tolerance]

## 24. DRUG ABUSE

You are the Chief of Medicine at a teaching hospital, and one of the ICU nurses tells you that she is worried about S.R., a medical resident, who is acting peculiarly. He had been a pleasant sort during his rotation last year, but this time he is constantly nervous and irritable. He has failed to answer several STAT pages, because he frequently leaves the unit "to go to the men's room." Last night, he forgot to order maintenance i.v. fluids for four patients. The nurse thought this was odd, since he ordered i.v. fentanyl infusions for 3 of them.

[Physician drug abuse: Epidemiology, diagnosis, treatment]