

Problems and Questions for Conference (Digestive System)

1. *Sampling GI secretions:* Four patients are admitted to the hospital for gastrointestinal problems. In each, a tube is inserted into the GI tract and placed in a particular location described below, and fluid is removed continuously via a vacuum.
 - (1) Stomach, pre-pyloric area
 - (2) Common bile duct at the site of entry of the cystic duct
 - (3) Pancreatic duct
 - a. *Describe the electrolyte content of the various fluids.*
 - b. *What would be the acid-base consequences, if any, of continuous removal of the fluid?*

2. *Case: Osteomalacia* is a metabolic bone disorder in which there is a deficiency in the mineral component (chiefly calcium and phosphorus) of bone. Osteomalacia is usually a secondary condition resulting from a primary disorder in some other organ. Four adults have been admitted to the Medical Service with osteomalacia. Each patient was also found to have a primary disorder as listed below. For each, indicate how the primary disorder could have resulted in osteomalacia.
 - a. Chronic biliary fistula with complete diversion of bile from the intestine
 - b. Markedly diminished absorptive area in the proximal 2/3 of the small intestine due to “Non-tropical Sprue”
 - c. Resection of the distal 1/3 of the small intestine for treatment of “regional enteritis”
 - d. *Abetalipoproteinemia*, a disorder due to a deficiency of apoprotein B, in which biosynthesis of chylomicron formation is defective.

3. *Case: Malabsorption.* Malabsorption of lipids results in *steatorrhea*, increased fat in the stools. Describe why the following patients might have steatorrhea:
- following antrectomy for peptic ulcer
 - obstruction of the common bile duct
 - ileal resection
 - Bacterial overgrowth in a proximal portion of the small intestine
 - cystic fibrosis
 - chronic pancreatitis
 - gastrinoma (Zollinger-Ellison syndrome)
 - extensive resection of intestine
 - Abetalipoproteinemia
4. *Case: anemia.* Describe a plausible mechanism for why each of the following patients becomes anemic.
- A 60 year old woman found to have *mucosal atrophy* on gastric biopsy.
 - A 20 year old with inflammatory bowel disease affecting the terminal small bowel.
 - 40 year old patient with a gastro-jejunal bypass of the duodenum following surgery for ulcer disease.
5. *Case: Jaundice:* Three patients appear with jaundice: one has hemolysis, one has hepatitis, and the last has a stone in the bile duct. Each develops a characteristic profile of laboratory changes that illuminates the abnormality resulting in elevated bilirubin. Fill in the accompanying table using the code of: *nl*: normal; ↑ *to* ↑↑↑ for a mild to significant increase; ↓ *to* ↓↓↓ for a mild to moderate decrease. Be sure to understand *why* these changes occur.

Table 1 Jaundice

<i>Parameter</i>	<i>Hemolysis</i>	<i>Hepatitis</i>	<i>Stone</i>
Total bilirubin			
Unconjugated bilirubin			
Conjugated bilirubin			
Bilirubinuria			
Urobilinogen (urine)			
Stool color			

6. *Case: diarrhea.* What is the mechanism by which each of the following patients might have developed diarrhea:
- a. Infection with bacterial producing a toxin that activates adenylyl cyclase (Cholera)
 - b. Lactase deficiency
 - c. Zollinger-Ellison syndrome (gastrinoma)
 - d. Carcinoid syndrome (overproduction of serotonin)
7. What would be the effects on gastrointestinal motility of the following conditions, and why?
- a. Severing of the vagus nerve (vagotomy)
 - b. Carcinoid syndrome