9. Required laboratory tests in evaluation of a patient under consideration for heart transplantation include all of the following EXCEPT
   A. Psychosocial evaluation
   B. Cardiac catheterization
   C. Dental examination
   D. All of the above

Answer: D
Pretransplant, both candidates and potential donors are evaluated to ensure their suitability for the procedure. Transplant candidates undergo echocardiography, right and left heart catheterization, evaluation for any undiagnosed malignancies, laboratory testing to assess the function of other organs (such as the liver, kidneys, and endocrine system), a dental examination, psychosocial evaluation, and appropriate screening (such as mammography, colonoscopy, and prostate-specific antigen testing). Once the evaluation is complete, the selection committee determines, at a multidisciplinary conference, whether or not a heart transplant is needed and is likely to be successful. Transplant candidates who meet all of the center’s criteria are added to the waiting list, according to the UNOS criteria, which are based on health status. (See Schwartz 10th ed., p. 355.)

Answer: B
Transplants between genetically nonidentical persons lead to recognition and rejection of the organ by the recipient’s immune system, if no intervention is undertaken. The main antigens responsible for this process are part of the major histocompatibility complex (MHC). In humans, these antigens make up the HLA system. The antigen-encoding genes are located on chromosome 6. Two major classes of HLAs are recognized. They differ in their structure, function, and tissue distribution. Class I antigens (HLA-A, HLA-B, and HLA-C) are expressed by all nucleated cells. Class II antigens (HLA-DR, HLA-DP, and HLA-DQ) are expressed by antigen-presenting cells (APCs) such as B lymphocytes, dendritic cells, macrophages, and other phagocytic cells.

The principal function of HLAs is to present the fragments of foreign proteins to T lymphocytes. This leads to recognition and elimination of the foreign antigen with great specificity. HLA molecules play a crucial role in transplant recipients as well. They can trigger rejection of a graft via two different mechanisms. The most common mechanism is cellular rejection, in which the damage is done by activated T lymphocytes. (See Schwartz 10th ed., p. 324.)

Answer: D
The introduction of cyclosporine in the early 1980s dramatically altered the field of transplantation by significantly improving outcomes after kidney transplantation. Cyclosporine binds with its cytoplasmic receptor protein, cyclophilin, which subsequently inhibits the activity of calcineurin, thereby decreasing the expression of several critical T-cell activation genes, the most important being for IL-2. As a result, T-cell activation is suppressed. (See Schwartz 10th ed., p. 328.)

Answer: C
Diabetes and hypertension are the leading causes of chronic renal disease. Concomitant cardiovascular disease (CVD) is a common finding in this population. An estimated 30% to 42% of deaths with a functioning kidney graft are due to CVD. Therefore, assessment of the potential kidney transplant candidate’s cardiovascular status is an important part of the pretransplant evaluation. (See Schwartz 10th ed., p. 335.)
7. Which of the following have been shown to decrease the time of postoperative ileus?
   A. Cyclooxygenase-1 inhibitors
   B. Morphine patient-controlled analgesia
   C. Nasogastric drainage until full return of bowel function
   D. Erythromycin

   **Answer: D**
   Pharmacologic agents commonly used to stimulate bowel function include metoclopramide and erythromycin. Metoclopramide's action is limited to the stomach and duodenum, and it may help primarily with gastroparesis. Erythromycin is a motilin agonist that works throughout the stomach and bowel. Several studies demonstrate significant benefit from the administration of erythromycin in those suffering from an ileus. Alvimopan, a newer agent and a mu-opioid receptor antagonist, has shown some promise in many studies for earlier return of gut function and subsequent reduction in length of stay. Neostigmine has been used in refractory pan-ileus patients (Ogilvie syndrome) with some degree of success. It is recommended for patients receiving this type of therapy to be in a monitored unit. (See Schwartz 10th ed., p. 386.)

8. In order to reduce the overall risk of stress gastritis in ICU patients mechanically ventilated for >48 hours, their gastric pH level should be kept greater than
   A. 3
   B. 5
   C. 2
   D. 4

   **Answer: D**
   When patients in the ICU have a major bleed from stress gastritis, the mortality risk is as high as 50%. It is important to keep the gastric pH greater than 4 to decrease the overall risk for stress gastritis in patients mechanically ventilated for 48 hours or greater and patients who are coagulopathic. Proton pump inhibitors, H₂-receptor antagonists, and intragastric antacid installation are all effective measures. However, patients who are not mechanically ventilated or who do not have a history of gastritis or peptic ulcer disease should not be placed on gastritis prophylaxis postoperatively because it carries a higher risk of causing pneumonia. (See Schwartz 10th ed., p. 387.)

9. The treatment of choice for a biloma after laparoscopic cholecystectomy is
   A. Reoperation, closure of the leak, and drainage
   B. Percutaneous drainage
   C. Biliary stent
   D. Observation

   **Answer: C**
   A bile leak due to an unrecognized injury to the ducts may present after cholecystectomy as a biloma. These patients may present with abdominal pain and hyperbilirubinemia. The diagnosis of a biliary leak can be confirmed by computed tomography (CT) scan, endoscopic retrograde cholangiopancreaticogram (ERCP), or radionuclide scan. Once a leak is confirmed, a retrograde biliary stent and external drainage are the treatment of choice. (See Schwartz 10th ed., p. 387.)

10. The most frequent nosocomial infection is
    A. Urinary tract infection (UTI)
    B. Sepsis
    C. Pneumonia
    D. Fungal infection

    **Answer: A**
    The most frequent nosocomial infection is urinary tract infection (UTI). These infections are classified into complicated and uncomplicated forms. The uncomplicated type is a UTI that can be treated with outpatient antibiotic therapy. The complicated UTI usually involves a hospitalized patient with an indwelling catheter whose UTI is diagnosed as part of a fever workup. The interpretation of urine culture results of less than 100,000 CFU/mL is controversial. Before treating such a patient, one should change the catheter and then repeat the culture to see whether the catheter was simply colonized with organisms. Cultures with more than 100,000 CFU/mL
13. Closure of an appendectomy wound in a patient with perforated appendicitis who is receiving appropriate antibiotics will result in a wound infection in what percentage of patients?
   A. 3–4%
   B. 8–12%
   C. 15–18%
   D. 22–25%

   **Answer:** A

   Surgical management of the wound is also a critical determinant of the propensity to develop an SSI. In healthy individuals, class I and II wounds may be closed primarily, while skin closure of class III and IV wounds is associated with high rates of incisional SSIs (~25–30%). The superficial aspects of these latter types of wounds should be packed open and allowed to heal by secondary intention, although selective use of delayed primary closure has been associated with a reduction in incisional SSI rates. It remains to be determined whether National Nosocomial Infections Surveillance (NNIS) system type stratification schemes can be employed prospectively in order to target specific subgroups of patients who will benefit from the use of prophylactic antibiotic and/or specific wound management techniques. One clear example based on cogent data from clinical trials is that class III wounds in healthy patients undergoing appendectomy for perforated or gangrenous appendicitis can be primarily closed as long as antibiotic therapy directed against aerobes and anaerobes is administered. This practice leads to SSI rates of approximately 3 to 4%. (See Schwartz 10th ed., p. 199.)

14. A chronic carrier state occurs with hepatitis C infection in what percentage of patients?
   A. 90–99%
   B. 75–80%
   C. 50–60%
   D. 10–30%

   **Answer:** B

   Hepatitis C virus (HCV), previously known as non-A, non-B hepatitis, is an RNA flavivirus first identified specifically in the late 1980s. This virus is confined to humans and chimpanzees. A chronic carrier state develops in 75 to 80% of patients with the infection, with chronic liver disease occurring in three-fourths of patients who develop chronic infection. The number of new infections per year has declined since the 1980s due to routine testing of blood donors for this virus. Fortunately, HCV is not transmitted efficiently through occupational exposures to blood, with the seroconversion rate after accidental needlestick approximately 1.8%. (See Schwartz 10th ed., p. 156.)

15. Possible exposure to anthrax should be initially treated with
   A. Colistin
   B. Ciprofloxacin or doxycycline
   C. Amoxicillin
   D. Observation

   **Answer:** B

   Inhalational anthrax develops after a 1- to 6-day incubation period, with nonspecific symptoms including malaise, myalgia, and fever. Over a short period of time, these symptoms worsen, with development of respiratory distress, chest pain, and diaphoresis. Characteristic chest roentgenographic findings include a widened mediastinum and pleural effusions. A key aspect in establishing the diagnosis is eliciting an exposure history. Rapid antigen tests are currently under development for identification of this gram-positive rod. Postexposure prophylaxis consists of administration of either ciprofloxacin or doxycycline. If an isolate is demonstrated to be penicillin-sensitive, the patient should be switched to amoxicillin. Inhalational exposure followed by the development of symptoms is associated with a high mortality rate. Treatment options include combination therapy with ciprofloxacin, clindamycin, and rifampin; clindamycin added to blocks production of toxin, while rifampin penetrates into the central nervous system and intracellular locations. (See Schwartz 10th ed., p. 156.)
1. Physiologic aging, or "senescence," is defined as decreased functional reserve of critical organ systems. It is generally believed to occur at what age?
   A. 55 years
   B. 70 years
   C. 90 years
   D. No defined age

Answer: B
The cut off for the definition of senescence has increased from 55 years in the late 1960s to 70 years currently. This is a general definition as each patient should be assessed for their own capacity to respond to the stress of surgery. (See Schwartz 10th ed., p. 1923.)

Answer: C
Frailty, disability (inability to perform more than one activity of daily living), and comorbidities such as anemia and hypoalbuminemia are the primary conditions which impact on the outcome of surgical procedures in the elderly. Each condition should be assessed preoperatively. (See Schwartz 10th ed., p. 1926.)

Answer: D
Biliary tract disease due to pigmented or cholesterol stone formation and acute cholecystitis are common problems in the elderly and most likely to lead to surgical intervention. The mortality risk of emergency cholecystectomy is four times that of elective cholecystectomy in the elderly. (See Schwartz 10th ed., p. 1924.)

Answer: A
Impaired cardiac reserve means that elderly patients cannot increase their ejection fraction as demand increases, but are dependent on ventricular filling and increased stroke volume to meet the need for increased output. Intravascular volume is therefore critically important, but fluid overload is poorly tolerated and can result in congestive heart failure. (See Schwartz 10th ed., pp. 1926–1927.)

Answer: A
In elderly patients with acute appendicitis or acute cholecystitis, one-third lack symptoms of abdominal pain, one-third are afebrile, and one-third have a normal white blood cell count. Therefore an "unimpressive" abdominal examination is irrelevant in the evaluation of the elderly patient whose tolerance for food has suddenly changed. (See Schwartz 10th ed., p. 1926.)