1- A 22-year-old man develops marked right lower quadrant abdominal pain over the past day. On physical examination there is rebound tenderness on palpation over the right lower quadrant. Laparoscopic surgery is performed, and the appendix is swollen, erythematous, and partly covered by a yellowish exudate. It is removed, and a microscopic section shows infiltration with numerous neutrophils. The pain experienced by this patient is predominantly the result of which of the following two chemical mediators?

A  Complement C3b and IgG
B  Interleukin-1 and tumor necrosis factor
C  Histamine and serotonin
D  Prostaglandin and bradykinin
E  Leukotriene and HPETE

Answer :D

2A 40-year-old woman had laparoscopic surgery 3 months ago. Now she has a small 0.5 cm nodule beneath the skin at the incision site that was sutured. Which of the following cell types is most likely to be most characteristic of the inflammatory response in this situation?

A  Mast cell
B  Eosinophil
C  Giant cell
D  Neutrophil
E  Plasma cell

Answer :D
A 39-year-old man incurs a burn injury to his hands and arms while working on a propane furnace. Over the next 3 weeks, the burned skin heals without the need for skin grafting. Which of the following is the most critical factor in determining whether the skin in the region of the burn will regenerate?

A  Good cardiac output with tissue perfusion  
B  Persistence of skin appendages  
C  Maintenance of underlying connective tissue  
D  Diminished edema and erythema  
E  Granulation tissue formation

Answer: B

A 58-year-old woman has had a cough with fever for 3 days. A chest radiograph reveals infiltrates in the right lower lobe. A sputum culture grows Streptococcus pneumoniae. The clearance of these organisms from the lung parenchyma would be most effectively accomplished through generation of which of the following substances by the major inflammatory cell type responding to this infection?

A  Platelet activating factor  
B  Prostaglandin E2  
C  Kallikrein  
D  Leukotriene B4  
E  Hydrogen peroxide

Answer: E
5 A clinical study is performed of patients with pharyngeal infections. The most typical clinical course averages 3 days from the time of onset until the patient sees the physician. Most of these patients experience fever and chills. On physical examination, the most common findings include swelling, erythema, and pharyngeal purulent exudate. Which of the following types of inflammation did these patients most likely have?

A  Granulomatous
B  Acute
C  Gangrenous
D  Resolving
E  Chronic

Answer: B

6 A 56-year-old man has had increasing dyspnea for 6 years. He has no cough or fever. He had chronic exposure to inhalation of silica dust for many years in his job. A chest x-ray now shows increased interstitial markings and parenchymal 1 to 3 cm solid nodules. His pulmonary problems are most likely to be mediated through which of the following inflammatory processes?

A  Neutrophilic infiltrates producing leukotrienes
B  Foreign body giant cell formation
C  Plasma cell synthesis of immunoglobulins
D  Mast cell histamine release
E  Macrophage elaboration of cytokines

Answer: D
7 A 22-year-old woman has premature labor with premature rupture of fetal membranes at 20 weeks gestation. Prior to that time, the pregnancy had been proceeding normally. A stillbirth occurs two days later. Microscopic examination of the normal-sized placenta reveals numerous neutrophils in the amnion and chorion, but no villitis. The premature labor was most likely mediated by the effects from release of which of the following substances?

A  Immunoglobulin
B  Prostaglandin
C  Complement
D  Fibrinogen
E  Lymphokines

**Answer: B**

9 A 43-year-old woman has had a chronic cough with fever and weight loss for the past month. A chest radiograph reveals multiple nodules from 1 to 4 cm in size, some of which demonstrate cavitation in the upper lobes. A sputum sample reveals the presence of acid fast bacilli. Which of the following cells is the most important in the development her lung lesions?

A  Macrophage
B  Fibroblast
C  Neutrophil
D  Mast cell
E  Platelet

**Answer: A**
10 A 20-year-old man has experienced painful urination for 4 days. A urethritis is suspected, and Neisseria gonorrhoeae is cultured. Numerous neutrophils are present in a smear of the exudate from the penile urethra. These neutrophils undergo diapedesis to reach the organisms. Release of which of the following chemical mediators is most likely to drive neutrophil exudation?

A  Histamine  
B  Prostaglandin  
C  Hageman factor  
D  Bradykinin  
E  Complement

**Answer: E**

11 An episode of marked chest pain lasting 4 hours brings a 51-year-old man to the emergency room. He is found to have an elevated serum creatine kinase. An angiogram reveals a complete blockage of the left circumflex artery 2 cm from its origin. Which of the following substances would you most expect to be elaborated around the region of tissue damage in the next 3 days as an initial response to promote healing?

A  Histamine  
B  Immunoglobulin G  
C  Complement component C3b  
D  Leukotriene B4  
E  Vascular endothelial growth factor

**Answer: E**
12 A 94-year-old woman has developed a fever and cough over the past 2 days. Staphylococcus aureus is cultured from her sputum. She receives a course of antibiotic therapy. Two weeks later she no longer has a productive cough, but she still has a fever. A chest radiograph reveals a 3 cm rounded density in the right lower lobe whose liquefied contents form a central air-fluid level. There are no surrounding infiltrates. Which of the following is the best description for this outcome of her pneumonia?
A  Hypertrophic scar
B  Abscess formation
C  Regeneration
D  Bronchogenic carcinoma
E  Chronic inflammation
F  Granulomatous cavitation

**Answer: B**

13 A 36-year-old woman has been taking acetylsalicylic acid (aspirin) for arthritis for the past 4 years. Her joint pain is temporarily reduced via this therapy. However, she now has occult blood identified in her stool. Which of the following substances is most likely inhibited by aspirin to cause this complication?
A  Leukotriene B4
B  Interleukin-1
C  Thromboxane
D  Bradykinin

**Answer: C**
14 A small sliver of wood becomes embedded in the finger of a 25-year-old man. He does not remove it, and over the next 3 days the area around the sliver becomes red, swollen, and tender. Neutrophils migrate into the injured tissue. Expression of which of the following substances on endothelial cells is most instrumental in promoting this inflammatory reaction?

A  Interferon gamma  
B  Hageman factor  
C  Lysozyme  
D  E-selectin  
E  Prostacyclin

Answer: D

15 An inflammatory process that has continued for 3 months includes the transformation of tissue macrophages to epithelioid cells. There are also lymphocytes present. Over time, fibroblasts lay down collagen as the focus of inflammation heals. These events are most likely to occur as an inflammatory response to which of the following infectious agents?

A  Mycobacterium tuberculosis  
B  Pseudomonas aeruginosa  
C  Cytomegalovirus  
D  Giardia lamblia  
E  Treponema pallidum

Answer: A
16 A 37-year-old man has had nausea and vomiting for 5 weeks. He experienced an episode of hematemesis yesterday. On physical examination he has no abnormal findings. Upper GI endoscopy is performed, and there is a 1.5 cm diameter lesion in the gastric antrum with loss of the epithelial surface. These findings are most typical for which of the following pathologic processes?

A  Abscess
B  Serositis
C  Granuloma
D  Gangrene
E  Ulcer

Answer: A

17 A 17-year-old truck driver is involved in a collision. He incurs blunt force abdominal trauma. In response to this injury, cells in tissues of the abdomen are stimulated to enter the G1 phase of the cell cycle from the G0 phase. Which of the following cell types is most likely to remain in G0 following this injury?

A  Smooth muscle
B  Endothelium
C  Skeletal muscle
D  Fibroblast
E  Hepatocyte

Answer: C
18 A 19-year-old woman who works indoors spends a day outside gardening. She does not wear a hat or sunscreen. That evening her partner remarks that her face appears red. Which of the following dermal changes most likely accounts for her red appearance?

A  Neutrophil aggregation
B  Hemorrhage
C  Edema
D  Hemolysis
E  Vasodilation

Answer: E

19 A 45-year-old woman has had a chronic, non-productive cough for 3 months, along with intermittent fever. She has a chest radiograph that reveals multiple small parenchymal nodules along with hilar and cervical lymphadenopathy. A cervical lymph node biopsy is performed. Microscopic examination of the biopsy shows noncaseating granulomatous inflammation. Cultures for bacterial, fungal, and mycobacterial organisms are negative. Which of the following chemical mediators is most important in the development of her inflammatory response?

A  Interferon gamma
B  Bradykinin
C  Complement C5a
D  Histamine
E  Prostaglandin E2

Answer: A
20 A 55-year-old man has a history of hypercholesterolemia with coronary artery disease and suffered a myocardial infarction 2 years ago. He now presents with crushing substernal chest pain. Which of the following laboratory tests is most useful in diagnosing the cause of his chest pain?

A  Increased white blood cell count
B  Elevated sedimentation rate
C  Decreased serum complement
D  Increased serum troponin
E  Decreased platelet count
F  Increased serum cholesterol

Answer: D

21 A 15-year-old girl has had episodes of sneezing with watery eyes and runny nose for the past 2 weeks. On physical examination she has red, swollen nasal mucosal surfaces. She has had similar episodes each Spring and Summer when the amount of pollen in the air is high. Her symptoms are most likely to be mediated by the release of which of the following chemical mediators?

A  Complement C3b
B  Platelet activating factor (PAF)
C  Tumor necrosis factor (TNF)
D  Histamine
E  Immunoglobulin G

Answer: D
22 A 45-year-old man has been working hard all day long carrying loads of bricks to build a wall. He takes a non-steroidal anti-inflammatory drug (ibuprofen). Which of the following processes is this drug most likely to diminish in his arms?

A Thrombosis
B Pain
C Necrosis
D Fibrinolysis
E Scar formation

Answer: B

23 Within minutes following a bee sting, a 37-year-old man develops marked respiratory stridor with dyspnea and wheezing. He also develops swelling and erythema seen in his arms and legs. An injection of epinephrine helps to reverse these events and he recovers within minutes. Which of the following chemical mediators is most important in the pathogenesis of this man's condition?

A Bradykinin
B Complement C5a
C Nitric oxide
D Tumor necrosis factor
E Histamine

Answer: E
24 A 72-year-old woman did not get a 'flu' shot in the fall as recommended for older persons. In the wintertime, she became ill, as many people in her community did, with a respiratory illness that lasted for 3 weeks. During this illness, she had a fever with a non-productive cough, mild chest pain, myalgias, and headache. What was her chest radiograph most likely to have shown during this illness?

A  Hilar mass
B  Interstitial infiltrates
C  Hilar lymphadenopathy
D  Lobar consolidation
E  Pleural effusions

Answer: B

25 In an experiment, Enterobacter cloacae organisms are added to a solution containing leukocytes and blood plasma. Engulfment and phagocytosis of the microbes is observed to occur. Next a substance is added which enhances engulfment, and more bacteria are destroyed. Which of the following substances in the plasma is most likely to produce this effect?

A  Complement C3b
B  Glutathione peroxidase
C  Immunoglobulin M
D  P-selectin
E  NADPH oxidase

Answer: B
28 In an experiment, surgical wound sites are observed following suturing. An ingrowth of new capillaries is observed to occur within the first week. A substance elaborated by macrophages is found at the wound site to stimulate this capillary proliferation. Which of the following substances is most likely to have this function?

A  Platelet-derived growth factor  
B  Phospholipase C-gamma  
C  Fibronectin  
D  Fibroblast growth factor  
E  Epidermal growth factor  

Answer: D  

29 A 55-year-old man with a history of ischemic heart disease has worsening congestive heart failure. He has noted increasing dyspnea and orthopnea for the past 2 months. On physical examination there is dullness to percussion at lung bases. A chest x-ray shows bilateral pleural effusions. A left thoracentesis is performed, and 500 mL of fluid is obtained. Which of the following characteristics of this fluid would most likely indicate that it is a transudate?

A  Cloudy appearance  
B  High protein content  
C  <3 lymphocytes/microliter  
D  Presence of fibrin  
E  Large size of the effusion  

Answer: C
In a clinical study, patients undergoing laparoscopic cholecystectomy are followed to document the post-surgical wound healing process. The small incisions are closed with sutures. Over the 4 weeks following surgery, the wounds are observed to regain tensile strength and there is re-epithelialization. Of the following substances, which is most likely found to function intracellularly in cells involved in this wound healing process?

A  Fibronectin  
B  Laminin  
C  Tyrosine kinase  
D  Hyaluronic acid  
E  Collagen

Answer: C

A 31-year-old woman has a laparotomy performed for removal of an ovarian cyst. She recovers uneventfully, with no complications. At the time of surgery, a 12 cm long midline abdominal incision was made. The tensile strength in the surgical scar will increase so her normal activities can be resumed. Most of the tensile strength will likely be achieved in which of the following time periods?

A  One week  
B  One month  
C  Three months  
D  Six months  
E  One year

Answer: C
32 A 9-year-old girl sustains a small 0.5 cm long laceration to her right index finger while playing 'Queen of Swords' with a letter opener. Which of the following substances, on contact with injured vascular basement membrane, activates both the coagulation sequence and the kinin system as an initial response to this injury?

A  Thromboxane  
B  Plasmin  
C  Platelet activating factor  
D  Hageman factor  

Answer: D

33 A 65-year-old woman has had a fever for the past day. On physical examination her temperature is 39°C and blood pressure 90/50 mm Hg with heart rate of 106/minute. Laboratory studies show a WBC count of 12,510/microliter and WBC differential count of 78 segs, 8 bands, 11 lymphs, and 3 monos. A blood culture is positive for Escherichia coli. Her central venous pressure falls markedly. She goes into hypovolemic shock as a result of the widespread inappropriate release of a chemical mediator derived from macrophages. She develops multiple organ failure. Which of the following mediators is most likely to produce these findings?

A  Nitric oxide  
B  Bradykinin  
C  Histamine  
D  Prostacyclin  

Answer: A
34 A 20-year-old woman sustains an injury to her right calf in a mountain biking accident. On physical examination she has a 5 cm long laceration on the right lateral aspect of her lower leg. This wound is closed with sutures. Wound healing proceeds over the next week. Which of the following factors will be most likely to aid and not inhibit wound healing in this patient?

A  Commensal bacteria 
B  Decreased tissue perfusion 
C  Presence of sutures 
D  Corticosteroid therapy 
E  Hypoalbuminemia 

Answer: C

36 A 19-year-old man incurs a stab wound to the chest. The wound is treated in the emergency room. Two months later there is a firm, 3 x 2 cm nodular mass with intact overlying epithelium in the region of the wound. On examination the scar is firm, but not tender, with no erythema. This mass is excised and microscopically shows fibroblasts with abundant collagen. Which of the following mechanisms has most likely produced this series of events?

A  Keloid formation 
B  Development of a fibrosarcoma 
C  Poor wound healing from diabetes mellitus 
D  Foreign body response from suturing 
E  Staphylococcal wound infection 

Answer : A
37 A 45-year-old man has had a fever and dry cough for 3 days, and now has difficulty breathing and a cough productive of sputum. On physical examination his temperature is 38.5°C. Diffuse rales are auscultated over lower lung fields. A chest radiograph shows a right pleural effusion. A right thoracentesis is performed. The fluid obtained has a cloudy appearance with a cell count showing 15,500 leukocytes per microliter, 98% of which are neutrophils. Which of the following terms best describes his pleural process?

A  Serous inflammation
B  Purulent inflammation
C  Fibrinous inflammation
D  Chronic inflammation

Answer : B

39 In an experiment, a lung tissue preparation is exposed to Mycobacterium tuberculosis organisms. Over the next week, it is observed that granulomas form in the lung. Within the granuloma are found inflammatory cells expressing class II MHC antigens. These cells elaborate cytokines that promote fibroblastic production of collagen within the granulomas. From which of the following peripheral blood leukocytes are these cells bearing class II antigen most likely to be derived?

A  Neutrophils
B  B cells
C  Monocytes
D  NK cells

Answer : A