



مقدم من فريق أفق الطبي



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

فَأَمَّا الزُّبْدُ فَغَدَاةٌ جُفَاءٌ وَأَمَّا مَا يَنْفَعُ النَّاسَ فَبَيِّنَةٌ
فِي الْأَرْضِ كَذَلِكَ يَضْرِبُ اللَّهُ الْأَمْثَالَ ﴿٣٥﴾

GENERAL PATHOLOGY

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تجميع مصادر الميـد

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نخلي المسؤولية عن أي شيء
انتم أحرار ماذا تعتمدون

2022

بالنسبة لامتحان الباثو
تبع السنة السابقة
فهو حرفيا مصادر

١٤ سؤال اختر
كيسر مه موقع
كوزلت (55cell injury)
(75 inflammation)

٦ اسئلة اختر و الصم و الغلط
مه المصدر الي معنا أيضا

بالتوفيق دعوة صلو

55 سؤال كيسيز مهم جدا – Cell Injury

48 year old woman has a malignant lymphoma involving lymph nodes in the para-aortic region. She is treated with a chemotherapeutic agent which results in the loss of individual neoplastic cells through fragmentation of individual cell nuclei and cytoplasm. Over the next 2 months, the lymphoma decreases in size, as documented on abdominal CT scans. By which of the following mechanism has her neoplasm primarily responded to therapy?

- a. coagulative necrosis
- b. mitochondrial poisoning
- c. phagocytosis
- d. acute inflammation
- e. apoptosis

APOPTOSIS

A 53 year old man has experienced severe chest pain for the past 6 hours. On physical examination he is afebrile, but has tachycardia. Laboratory studies show a serum troponin I of 10 ng/mL. A coronary angiogram is performed emergently and reveals >90% occlusion of the anterior inter ventricular (left anterior descending) artery. In this setting, an irreversible injury to myocardial fibers will have occurred when which of the following cellular changes occurs?

- a. glycogen stores are depleted
- b. cytoplasmic sodium increases
- c. nuclei undergo karyorrhexis
- d. intracellular pH diminishes
- e. blebs form on cell membrane

NUCLEI UNDERGO KARYORRHEXIS

While in a home improvement center warehouse buying paint, a 35-year-old man hears 'Look out below!' and is then struck on the leg by a falling pallet rack, which strikes him on his left leg in the region of his thigh. The skin is not broken. Within 2 days there is a 5 x 7 cm purple colour to the site of injury. Which of the following substances has most likely accumulated at the site of injury to produce a yellow-brown colour at the site of injury 16 days later?

- a. lipofuscin
- b. bilirubin
- c. melanin
- d. hemosiderin
- e. glycogen

HEMOSIDERIN

A 54-year-old man with a chronic cough has a squamous cell carcinoma diagnosed in his right lung. While performing a pneumonectomy, the thoracic surgeon notes that the hilar lymph nodes are small, 0.5 to 1.0 cm in size, and jet black in colour throughout. Which of the following is the most likely cause for this appearance to the hilar nodes?

- a. anthracitic pigment
- b. lipochrome deposits
- c. melanin accumulation
- d. hemosiderosis
- e. metastatic carcinoma

ANTHRACITIC PIGMENT

A 50-year-old woman with a history of unstable angina suffers an acute myocardial infarction. Thrombolytic therapy with tissue plasminogen activator (tPA) is administered to restore coronary blood flow. In spite of this therapy, the degree of myocardial fiber injury may increase because of which of the following cellular abnormalities?

- a. cytoskeletal intermediate filament loss
- b. decreased intracellular pH from anaerobic glycolysis
- c. increased free radical formation
- d. mitochondrial swelling
- e. nuclear chromatin clumping
- f. reduced protein synthesis

INCREASED FREE RADICAL FORMATION

A 12-year-old boy has had multiple episodes of ear pain accompanied by fever. On examination his right tympanic membrane is red and bulging with yellow exudate. Laboratory studies of the exudate show culture positive for *Hemophilus influenzae*. A year later he has conductive hearing loss on the right, and a head CT scan shows a mass in the right middle ear. Which of the following materials is most likely to be seen in the tissue curetted from his middle ear?

- a. lipofuscin pigment
- b. russell bodies
- c. neutrophil granules
- d. cholesterol crystals
- e. anthracitic pigment

CHOLESTEROL CRYSTALS

A 43-year-old man has complained of mild burning substernal pain following meals for the past 3 years. Upper GI endoscopy is performed and biopsies are taken of an erythematous area of the lower esophageal mucosa 3 cm above the gastroesophageal junction. There is no mass lesion, no ulceration, and no hemorrhage noted. The biopsies show the presence of columnar epithelium with goblet cells. Which of the following mucosal alterations is most likely represented by these findings?

- a. dysplasia
- b. hyperplasia
- c. carcinoma
- d. ischemia
- e. metaplasia

METAPLASIA

A 71-year-old woman had the loss of consciousness that persisted for over an hour. When she becomes arousable, she cannot speak nor move her right

arm. A cerebral angiogram revealed an occlusion to her left middle cerebral artery. Months later, a computed tomographic (CT) scan shows a large 5 cm cystic area in her left parietal lobe cortex. This CT finding is most likely the consequence of resolution from which of the following cellular events?

- a. liquefactive necrosis
- b. atrophy
- c. coagulative necrosis
- d. caseous necrosis
- e. apoptosis

LIQUEFACTIVE NECROSIS

A 19-year-old woman gives birth to her first child. She begins breast feeding the infant. She continues breast feeding for almost a year with no difficulties and no complications. Which of the following cellular processes that began in the breast during pregnancy allowed her to nurse the infant for this period of time?

- a. stromal hypertrophy
- b. epithelial dysplasia
- c. steatocyte atrophy
- d. ductal epithelial metaplasia
- e. lobular hyperplasia

LOBULAR HYPERPLASIA

An 84-year-old man dies from complications of Alzheimer disease. At autopsy, his heart is small (250 gm) and dark brown on sectioning. Microscopically, there is light brown perinuclear pigment with H&E staining of the cardiac muscle fibers. Which of the following substances is most likely increased in the myocardial fibers to produce this appearance of his heart?

- a. hemosiderin from iron overload
- b. lipochrome from "Wear and tear"
- c. glycogen from a storage disease
- d. cholesterol from atherosclerosis
- e. calcium deposition following necrosis

LIPOCHROME FROM "WEAR AND TEAR"

In an experiment, a series of immunohistochemical stains are employed to identify different cellular components. One particular stain identifies the presence of intermediate filaments within cells. This cytokeratin stain is most likely to be useful for which of the following diagnostic purposes?

- a. cytoskeletal alterations indicate impending cell death
- b. a neoplasm is determined to be a carcinoma
- c. contractile properties of the cells can be assessed
- d. a history of chronic alcoholism can be confirmed
- e. the degree of metaplasia or dysplasia can be assessed

A NEOPLASM IS DETERMINED TO BE A CARCINOMA

A 20-year-old woman had Goodpasture syndrome which progressed to chronic renal failure. She is 165 cm tall and weighs 55 kg. She now has blood pressure measurements in the range of 150/90 to 180/110 mm Hg, but does not regularly take medications. Laboratory studies show her blood urea

nitrogen is over 100 mg/dL and she requires chronic dialysis. A chest x-ray shows an enlarged heart. The size of her heart is most likely to be the result of which of the following processes involving the myocardial fibers?

- a. hypertrophy
- b. fatty infiltration
- c. hyperplasia
- d. fatty degeneration
- e. edema

HYPERTROPHY

A 29-year-old man goes on a snorkeling trip to Looe Key Marine Sanctuary and later spends time on the beach at Bahia Honda State Park. The next day he has a darker complexion. His skin does not show warmth, erythema, or tenderness. His skin tone fades to its original appearance within a month. Which of the following substances contributes the most to the biochemical process leading to these skin changes?

- a. iron oxide
- b. lipofuscin
- c. tyrosine
- d. homogentisic acid
- e. glycogen

TYROSINE

A study is performed to identify predisposing risks for tissue cellular changes. In some persons epithelial metaplasia occurs. In which of the following situations is the process of epithelial metaplasia most likely to take place?

- a. tanning of the skin following sunlight exposure
- b. lactation following pregnancy
- c. vitamin A deficiency
- d. acute myocardial infarction
- e. urinary obstruction from an enlarged prostate

VITAMIN A DEFICIENCY

In an experiment, a disease process is found which leads to scattered loss of individual cells, with the microscopic appearance of karyorrhexis and cell fragmentation. The overall tissue structure remains intact. This process is most typical for which of the following diseases?

- a. viral hepatitis
- b. brown atrophy of the heart
- c. renal transplant rejection
- d. chronic alcoholic liver disease
- e. barbiturate overdose

VIRAL HEPATITIS

A 60-year-old woman has noted a dark red-black appearance to her great toe and second and third toes of her left foot for the past month. On physical examination, the toes are cold and have no sensation to touch. The dorsalis pedis and posterior tibial pulses are not palpable on the left. A transmetatarsal amputation is performed. These findings are most typical for a patient with which of the following conditions?

- a. diabetes mellitus
- b. gout
- c. blunt force trauma
- d. AIDS
- e. rheumatoid arthritis

DIABETES MELLITUS

A study is performed involving the microscopic analysis of tissues obtained from surgical procedures. Some of these tissues have the microscopic appearance of an increased cell size of multiple cells within the tissue, due to an increase in the amount of cell cytoplasm, with nuclei remaining uniform in size. Which of the following conditions is most likely to have resulted in this finding?

- a. uterine myometrium in pregnancy
- b. female breast at puberty
- c. liver following partial resection
- d. ovary following menopause
- e. cervix with chronic inflammation

UTERINE MYOMETRIUM IN PREGNANCY

A 17-year-old adolescent receives whole body radiation as part of a preparatory regimen for bone marrow transplantation to treat acute lymphocytic leukemia. Which of the following cells and tissues in the body is most likely to remain unaltered by the effects of this therapeutic radiation?

- a. primary follicles of ovary
- b. small intestinal epithelium
- c. erythropoietic cells of bone marrow
- d. spermatogonia of testicular tubules
- e. neurons of cerebral cortex

NEURONS OF CEREBRAL CORTEX

A 79-year-old man has a large myocardial infarction involving much of the left ventricular free wall. He develops congestive heart failure (CHF) with decreased cardiac output. Now, a year later, his CHF is worsening. By echocardiography there is a large, bulging akinetic area typical for a left ventricular aneurysm. Which of the following laboratory tests on serum would best indicate poor peripheral tissue perfusion in this patient?

- a. elevated troponin I
- b. increased sodium
- c. elevated lactate
- d. increased hematocrit
- e. increased sedimentation rate

ELEVATED LACTATE

A 22-year-old woman has a congenital anemia. She has required multiple transfusions of red blood cells for many years. She now has no significant findings on physical examination. Which of the following microscopic findings would most likely present in her liver?

- a. steatosis in hepatocytes

- b. bilirubin in canaliculi
- c. hemosiderin in hepatocytes
- d. glycogen in hepatocytes
- e. amyloid in portal triads

HEMOSIDERIN IN HEPATOCYTES

A 20-year-old man is involved in a motor vehicle accident which results in multiple blunt trauma and lacerations to his lower extremities. The left femoral artery is lacerated, and he incurs extensive blood loss and remains hypotensive for hours during transport to the emergency department. On admission, his hematocrit is 12%. Which of the following tissues is most likely to withstand the impact of these events with the least damage?

- a. skeletal muscle
- b. intestinal epithelium
- c. retina
- d. cerebral cortex
- e. renal tubules

SKELETAL MUSCLE

A 40-year-old woman has the sudden onset of severe abdominal pain. On physical examination she has diffuse tenderness in all abdominal quadrants, with marked guarding and muscular rigidity. She has laboratory findings that include serum AST of 43 U/L, ALT of 30 U/L, LDH 630 U/L, and lipase 415 U/L. An abdominal CT scan reveals peritoneal fluid collections and decreased attenuation along with enlargement of the pancreas. Which of the following cellular changes is most likely to accompany these findings?

- a. coagulative necrosis
- b. dry gangrene
- c. fat necrosis
- d. apoptosis
- e. liquefactive necrosis

FAT NECROSIS

A 26-year-old man has had a high fever for the past 2 days. On exam he has a heart murmur. Echocardiography shows destruction of the aortic valve by large, irregular vegetations. Staphylococcus aureus is cultured from his blood. He develops left upper quadrant pain. Abdominal CT shows a wedge-shaped 1.5 x 3 cm splenic lesion with base on the capsule. The splenic lesion is most likely to result from which of the following cellular abnormalities?

- a. coagulative necrosis
- b. abscess formation
- c. metaplasia
- d. caseous necrosis
- e. liquefactive necrosis

COAGULATIVE NECROSIS

A 35-year-old woman has developed increasing icterus over the last week. On exam her liver span is increased. Laboratory studies show hyperammonemia. Abdominal CT scan shows a liver twice normal size with markedly reduced attenuation. These changes in her liver most likely resulted from which of the following conditions?

- a. galactosemia
- b. hemochromatosis
- c. tuberculosis
- d. alcoholism
- e. hypoxemia

ALCOHOLISM

A 71-year-old man has difficulty with urination. His urinary retention leads to numerous trips to the restroom per day. On digital rectal examination the prostate is diffusely enlarged. Which of the following represents a pathologic change leading to this man's problem?

- a. dysplasia
- b. hypertrophy
- c. hyperplasia
- d. metaplasia
- e. neoplasia

HYPERPLASIA

A 55-year-old man has a 30-year history of poorly controlled diabetes mellitus. He has had extensive black discoloration of skin and soft tissue of his right foot, with areas of yellowish exudate, for the past 2 months. *Staphylococcus aureus* is cultured from this exudate. A below-the-knee amputation is performed. The amputation specimen received in the surgical pathology laboratory is most likely to demonstrate which of the following pathologic abnormalities?

- a. neoplasia
- b. gangrene
- c. vasculitis
- d. hemosiderosis
- e. caseation

GANGRENE

The lifestyle patterns of healthy persons from 20 to 30 years of age are studied. A subset of these persons have a lifestyle characterized by consumption of a lot of pizza and very little physical exercise. Which of the following tissue changes is most likely to develop in this subset of persons as a consequence of this lifestyle?

- a. fatty metamorphosis of liver
- b. pancreatic fat necrosis
- c. fatty degeneration of myocardium
- d. hypertrophy of steatocytes
- e. metaplasia of muscle to adipose tissue

HYPERTROPHY OF STEATOCYTES

In an experiment, a tissue preparation is subjected to oxidant stress. There are increased numbers of free radicals generated within the cells. Generation of which of the following enzymes within these cells is the most likely protective mechanism to reduce the number of free radicals?

- a. glutathione peroxidase

- b. catalase
- c. hydrogen peroxide
- d. NADPH oxidase
- e. myeloperoxidase

GLUTATHIONE PEROXIDASE

A 38-year-old man incurs a traumatic blow to his upper left arm. He continues to have pain and tenderness even after 3 months have passed. A plain film radiograph reveals a 4 cm circumscribed mass in the soft tissue adjacent to the humerus. The mass contains peripheral areas of brightness on the x-ray. Over the next year this mass gradually resolves. Which of the following terms best describes the changes described?

- a. dysplasia
- b. hyperplasia
- c. hypertrophy
- d. metaplasia
- e. neoplasia

METAPLASIA

A 31-year-old primigravida has a difficult delivery of a term infant, with loss of 1500 cc of blood. She has hypotension for 6 hours. Over the next month, her ACTH level decreases. Within the next 3 months, her adrenal glands become decreased in size. This alteration of the adrenals is primarily due to which of the following cellular processes?

- a. metaplasia
- b. gene mutation
- c. apoptosis
- d. autophagocytosis
- e. coagulative necrosis

AUTOPHAGOCYTOSIS

A 48-year-old man has a history of chronic alcohol abuse. He is still able to perform work at his job. He has had no major illnesses. On physical examination, there are no significant findings. Laboratory studies show a serum albumin of 4.1 g/dL, ALT 30 U/L, AST 33 U/L, and total bilirubin 1.1 mg/dL. Which of the following microscopic findings in his liver is most likely to be present?

- a. cholestasis
- b. fatty change
- c. hemochromatosis
- d. hypertrophy of smooth endoplasmic reticulum
- e. coagulative necrosis

FATTY CHANGE

A 44-year-old woman has had episodes of right upper quadrant pain during the past 2 weeks. Her stools have become pale in colour over the past 3 days. Laboratory studies show a serum total bilirubin of 9.7 mg/dL. A cholangiogram shows that a gallstone has passed into the common bile duct, resulting in obstruction of the biliary tract. Which of the following tissue accumulations is most likely to be visualized on her skin surfaces?

- a. hemosiderosis
- b. calcification
- c. lipofuscin deposition
- d. icterus
- e. steatosis

ICTERUS

A 45-year-old man has a traumatic injury to his forearm and incurs extensive blood loss. On physical examination in the emergency department his blood pressure is 70/30 mm Hg. Which of the following cellular changes is most likely to represent irreversible cellular injury as a result of this injury?

- a. epithelial dysplasia
- b. cytoplasmic fatty metamorphosis
- c. nuclear pyknosis
- d. atrophy
- e. anaerobic glycolysis
- f. autophagocytosis

NUCLEAR PYKNOSIS

A 73-year-old man suffers a 'stroke.' On physical examination he cannot move his right arm. A cerebral angiogram demonstrates occlusion of the left middle cerebral artery. An echocardiogram reveals a thrombus within a dilated left atrium. Which of the following is the most likely pathologic alteration from this event that has occurred in his brain?

- a. cerebral softening from liquefactive necrosis
- b. pale infarction with coagulative necrosis
- c. predominantly the loss of glial cells
- d. recovery of damaged neurons if the vascular supply is reestablished
- e. wet gangrene with secondary bacterial infection

CEREBRAL SOFTENING FROM LIQUEFACTIVE NECROSIS

A 30-year-old woman is claiming in a civil lawsuit that her husband has abused her for the past year. A workup by her physician reveals a 2 cm left breast mass. There is no lymphadenopathy. No skin lesions are seen, other than a bruise to her upper arm. A needle biopsy of the breast mass is performed. On microscopic examination, the biopsy shows fat necrosis. This biopsy result is most consistent with which of the following etiologies?

- a. physiologic atrophy
- b. breast trauma
- c. lactation
- d. radiation injury
- e. hypoxic injury

BREAST TRAUMA

A 46-year-old man has smoked 2 packs of cigarettes per day for the past 30 years. He has had a chronic cough for the past 3 years, worsening over the last 2 weeks. A suspicious left pulmonary parenchymal lesion is seen on a chest x-ray. He has a bronchoscopy performed. A biopsy of a segmental bronchus shows squamous metaplasia. Which of the following is the most appropriate interpretation of this finding?

- a. ischemic tissue damage
- b. irritant effect
- c. early stage of cancer
- d. viral infection
- e. congenital anomaly

IRRITANT EFFECT

A 44-year-old woman has had congestive heart failure for the past 4 years. She develops a fever that persists for over a week. On physical examination, a heart murmur is present. Her temperature is 38.4°C. Laboratory studies show a blood culture positive for *Streptococcus, viridans* group. An echocardiogram reveals a 1 cm vegetation on the superior aspect of her mitral valve. Which of the following pathologic changes is most likely present in her mitral valve?

- a. passive congestion
- b. necrosis
- c. extensive edema
- d. granulomatous inflammation
- e. dystrophic calcification

NECROSIS

An 18-year old G2 P1 woman has an amniocentesis performed at 17 weeks gestation. Fibroblasts recovered from amniocentesis are grown in culture to assess the karyotype of fetal cells. These cells are subcultured for additional experimental work, but the culture is lost after 50 doublings of the cells has occurred, and the fibroblasts no longer grow. Which of the following factors affecting these cells is most likely demonstrated by this phenomenon?

- a. nutrition
- b. mutation
- c. apoptosis
- d. aging
- e. oxidation

AGING

A 54-year-old man has sudden onset of severe, sharp chest pain with diaphoresis and dyspnea. On physical examination he has tachycardia with an irregular heart rhythm. Electrocardiographic changes suggest the possibility of focal myocardial damage involving the left lateral ventricular wall. Which of the following laboratory tests on the patient's serum is most useful in this situation?

- a. total cholesterol
- b. troponin I
- c. triglyceride
- d. lipase
- e. sedimentation rate

TROPONIN I

A 42-year-old previously healthy woman notes that over the past week her eyes have developed a yellowish appearance. She has had mild nausea and vomiting over the past week. On physical examination she has scleral icterus. She has no other major physical examination findings except for mild right

upper quadrant tenderness. Which of the following underlying conditions is most likely to contribute to development of her icterus?

- a. hypercholesterolemia
- b. thrombocytopenia
- c. metastatic carcinoma
- d. viral hepatitis
- e. diabetes mellitus

VIRAL HEPATITIS

A 56-year-old woman has smoked 2 packs of cigarettes per day for the past 35 years. She has had a chronic cough for the past 8 years, but recently has noted increased sputum production. On physical examination she has a few crackles auscultated best over the lung bases. Bronchoscopy with biopsy is performed. The biopsy reveals bronchial epithelium with squamous metaplasia. Which of the following statements represents the best interpretation of these findings?

- a. physiologic process of aging
- b. irreversible, even if she stops smoking
- c. metastases to the lung
- d. risk for infection
- e. thromboembolism with infarction

RISK FOR INFECTION

At the end of a normal menstrual cycle, the endometrium sloughs. Examination of the endometrium microscopically shows cellular fragmentation. Which of the following is most likely to trigger apoptosis in these endometrial cells?

- a. acute inflammation
- b. hypoxia
- c. p53 protein accumulation
- d. decreased estrogen
- e. anaerobic glycolysis

DECREASED ESTROGEN

An experiment is conducted to determine if cell membrane injury is lessened by the effects of vitamin E ingestion. Which of the following cellular components is primarily involved in generation of lipid peroxides, the formation of which is inhibited by the vitamin E?

- a. glutathione
- b. ionized calcium
- c. lactate
- d. ferric iron
- e. lipase

FERRIC IRON

A 35-year-old woman has had headaches and abdominal pain worsening for 3 months. There are no remarkable physical examination findings. On radionuclide scanning of the neck, she is found to have a mass involving one of her parathyroid glands. An abdominal CT scan suggests extensive nephrocalcinosis along with urinary tract calculi. Which of the following

laboratory test findings is most likely to accompany her disease?

- a. CO₂ of 30 mmol/L
- b. Phosphorus of 2.2 mg/dL
- c. Uric acid of 15.1 mg/dL
- d. Sodium of 121 mmol/L
- e. Calcium of 4.5 mg/dL

PHOSPHOROUS OF 2.2 mg/dL

A 21-year-old woman has a routine Pap smear performed for a health screening examination. The pathology report indicates that some cells are found cytologically to have larger, more irregular nuclei. A follow-up cervical biopsy microscopically demonstrates disordered maturation of the squamous epithelium, with hyperchromatic and pleomorphic nuclei extending nearly the full thickness of the epithelial surface. No inflammatory cells are present. Which of the following descriptive terms is best applied to these Pap smear and biopsy findings?

- a. dysplasia
- b. metaplasia
- c. anaplasia
- d. hyperplasia
- e. aplasia

DYSPLASIA

A 38-year-old man has a health screening examination. He has a routine chest x-ray that shows a 2 cm nodule in the right lower lobe. The nodule has focal calcifications. A wedge resection of the nodule is done. On microscopic examination the nodule shows caseous necrosis and calcification. Which of the following processes explains the appearance of the calcium deposition:

- a. dystrophic calcification
- b. apoptosis
- c. hypercalcemia
- d. metastatic calcification
- e. excessive ingestion of calcium

DYSTROPHIC CALCIFICATION

A 3-year-old child has been diagnosed with ornithine transcarbamylase deficiency and has developed hepatic failure. The left lobe of an adult donor liver is used as an orthotopic transplant. A year later, the size of each liver in donor and recipient is greater than at the time of transplantation. Which of the following cellular alterations is most likely to explain this phenomenon?

- a. metaplasia
- b. dysplasia
- c. hyperplasia
- d. anaplasia
- e. neoplasia

HYPERPLASIA

A morbidly obese 51-year-old woman dies from complications of heart disease. At autopsy, her heart weighs 600 gm (normal up to 300 gm) with all the chambers enlarged. Microscopically, there is increased fibrous connective

tissue seen in the interstitium between myocardial fibers. The fibers are increased in size. Beneath the epicardium can be seen adipocytes interdigitating with the myocardial fibers. Which of the following terms best describes the presence of the adipocytes in her myocardium?

- a. steatosis
- b. lipid degeneration
- c. fatty infiltration
- d. cholesterolosis
- e. xanthomatosis

FATTY INFILTRATION

A cellular mutation results in transcription with translation of a protein that does not fold properly. The misfolded protein remains within the cell and is not excreted. Activation of which of the following cytoplasmic enzymes is most likely to occur?

- a. caspase
- b. glutathione peroxidase
- c. NADPH oxidase
- d. ribonuclease
- e. terolmerase

CASPASE

A 53-year-old man suffers a cardiac arrest and his wife calls emergency services. The paramedics arrive a few minutes later and begin life support measures. A regular heart rate is established after 40 minutes of resuscitative efforts as he is being transported to the hospital. A thrombolytic agent (tPA) is administered. Which of the following cellular processes is most likely to occur in his myocardium following administration of the tPA?

- a. apoptosis
- b. free radical injury
- c. heterophagocytosis
- d. squamous metaplasia
- e. accumulation of cytokeratines

FREE RADICAL INJURY

A 38-year-old woman has severe abdominal pain with hypotension and shock that has developed over the past 36 hours. On physical examination, her abdominal muscles are rigid and her abdomen is extremely tender. An abdominal CT scan reveals fluid density in the region of the pancreas, which appears to be enlarged. Which of the following laboratory test findings in her serum is most likely to be present?

- a. alanine aminotransferase of 1123 U/L
- b. total cholesterol of 324 mg/dL
- c. creatine kinase of 869 U/L
- d. urea nitrogen of 110 mg/dL
- e. lipase of 1134 U/L

LIPASE OF 1134 U/L

A 45-year-old man has noted scleral icterus for the past 4 days. He has been feeling tired and 'run down' for about a month. On physical examination, other

than mild tachycardia, his vital signs are normal. No other physical examination findings are of noted other than scleral icterus. Laboratory studies show a hematocrit of 25%. Which of the following conditions is most likely to account for these findings?

- a. systemic hypertension
- b. excessive iron absorption
- c. diabetes mellitus, type I
- d. intravascular hemolysis
- e. pulmonary squamous cell carcinoma

INTRAVASCULAR HEMOLYSIS

A 49-year-old man with a history of alcohol abuse has increasing abdominal girth. On examination his liver edge is firm. A liver biopsy shows cirrhosis, and individual hepatocytes contain red, globular inclusions positive for cytokeratin with immunohistochemical staining. Which of the following structural elements are these intracellular globules most likely to contain?

- a. actin and myosin
- b. cholesterol esters
- c. fatty acids
- d. fibronectin
- e. intermediate filaments
- f. microtubules

INTERMEDIATE FILAMENTS

A 31-year-old woman has been previously diagnosed with systemic lupus erythematosus. She has had chest pain for the past 6 months. A chest radiograph shows bilateral pleural effusions. Thoracentesis on the right yields 400 mL of clear yellow serous fluid, and a cell count shows only a few cells present. What type of cell is most likely to be most numerous in this fluid?

- a. basophil
- b. ciliated columnar cell
- c. eosinophil
- d. fibroblast
- e. langhans giant cell
- f. lymphocyte
- g. neutrophil

LYMPHOCYTE

A 65-year-old woman has the sudden inability to move her right arm and to speak. MR angiography shows occlusion of a cerebral artery. She is given tissue plasminogen activator (tPA). Over the next week she regains some ability to move her arm and to speak. Which of the following cellular changes most likely subsided upon tPA therapy?

- a. cell fragmentation
- b. cell swelling
- c. cytoplasmic eosinophilia
- d. membrane disruption
- e. nuclear karyorrhexis
- f. nuclear pyknosis

CELL SWELLING

Inflammation

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

(D) CORRECT. The findings are those of acute appendicitis. The acute inflammation is marked by neutrophil exudation. Release of a variety of chemical mediators results in the findings associated with inflammation: calor (warmth), rubor (erythema), tumor (swelling), and dolor (pain). The analgesic aspirin, by inhibiting the cyclooxygenase pathway, can decrease prostaglandin synthesis.

2. A 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

(C) CORRECT. The suture is a foreign material and produces a foreign body reaction. Persistence of the stimulus recruits macrophages that are activated and transformed to giant cells, in this case foreign body giant cells.

3. 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

(B) CORRECT. The skin appendages have epithelium from which the surface epidermis can regenerate. A partial thickness burn retains epithelial elements in the skin. This is why a full thickness burn is much worse and requires grafting.

4. 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

(E) CORRECT. Hydrogen peroxide is reduced by myeloperoxidase to a powerful oxidant that kills bacteria. She has an acute inflammatory response to a bacterial organism, and the majority of inflammatory cells responding will be neutrophils.

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

(B) CORRECT. The short course of days and the purulent exudate are typical features of acute inflammation with a neutrophilic response, most often caused by a bacterial organisms such as group A *Streptococcus*. Lacking evidence for an acute bacterial infection, avoid use of antibiotics.

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

(E) CORRECT. Cytokines including growth factors are released from macrophages that have ingested silica crystals, and these factors stimulate collagen production by fibroblasts, producing interstitial fibrosis and nodule formation that reduces and restricts the amount of normal lung parenchyma and makes breathing more difficult.

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

(B) CORRECT. Prostaglandins are mediators of acute inflammation that promote labor through effects on smooth muscle and blood vessels.

8. After two weeks in the hospital following a fall in which she incurred a fracture of her left femoral trochanter, a 76-year-old woman now has a left leg that is swollen, particularly her lower leg below the knee. She experiences pain on movement of this leg, and there is tenderness to palpation. Which of the following complications is most likely to occur next after these events?

- A Gangrenous necrosis of the foot
- B Hematoma of the thigh
- C Disseminated intravascular coagulation
- D Pulmonary thromboembolism
- E Soft tissue sarcoma

(D) CORRECT. She has deep and superficial venous thrombosis as a consequence of venous stasis from immobilization following the accident. The large deep venous thrombi can embolize to the lungs and lead to death.

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

(A) CORRECT. Epithelioid cells and giant cells are derived from activated macrophages. Tissue macrophages are derived from blood monocytes. These cells are important in the development of granulomatous inflammation in the adaptive immune response to tuberculosis.

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

(E) CORRECT. The C5a component of complement, along with TNF, leukotrienes, and bacterial products, is chemotactic for neutrophils.

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

(E) CORRECT. The VEGF stimulates angiogenesis to aid in establishing collateral circulation and restoring blood flow to the myocardium in this patient with an acute myocardial infarction.

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

(B) CORRECT. The formation of a fluid filled cavity following an infection with *S. aureus* suggests that liquefactive necrosis has occurred. The cavity is filled with tissue debris and viable and dead neutrophils (pus). Localized, pus filled cavities are called abscesses. The liquified contents seek a level (air-fluid level).

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, radiographs of her knees reveals continuing joint destruction with loss of articular cartilage and joint space narrowing. This pain reduction is most likely to be the result of diminishing which of the following chemical mediators?

- A Leukotriene B4
- B Interleukin-1
- C Prostaglandin
- D Bradykinin
- E Hageman factor

(C) CORRECT. Prostaglandins are produced via the cyclooxygenase pathway of arachidonic acid metabolism. Aspirin and non-steroidal anti-inflammatory drugs block the synthesis of prostaglandins that produce pain.

Acetaminophen, which does not have the effect upon platelets that aspirin does, would be a better choice for the arthritis pain.

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

(D) CORRECT. Selectins are adhesive molecules expressed on endothelial cell surfaces and attract leukocytes, mainly neutrophils. P-selectin is expressed rapidly, while E-selectin is expressed within several hours.

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

(A) CORRECT. Mycobacterial organisms are difficult to kill, because of their lipid coat of mycolic acid. Hence a neutrophilic response has little effect. This persistent infection requires macrophage activation that leads to granuloma formation.

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

(E) CORRECT. The loss of an epithelial surface with inflammation is called an ulceration. The presence of hydrochloric acid in the stomach promotes this process when epithelial injury occurs.

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

(C) CORRECT. Skeletal and cardiac muscle cells do not typically proliferate in response to injury, and necrotic cells are replaced by connective tissue. Remaining striated muscle cells, however, can undergo hypertrophy.

18. A 19-year-old woman is in the early second trimester at 16 weeks gestation with her first pregnancy. On a routine prenatal visit, the nurse

cannot detect fetal heart tones and an ultrasound reveals no fetal cardiac activity or fetal movement. The mother has noted no recent illness or other factors for this fetal demise. She is given a pharmacologic agent to induce abortion. By which of the following mechanisms is this induction most likely to be accomplished?

- A Leukotriene-induced neutrophil aggregation
- B Complement-induced hemolysis
- C Histamine-induced edema
- D Endotoxin-induced disseminated intravascular coagulation
- E Prostaglandin-induced muscular contraction

(E) CORRECT. Prostaglandins are generated through the cyclooxygenase pathway of arachidonic acid metabolism and induce smooth muscle contraction in the uterus for induction to expel the fetus.

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

(A) CORRECT. This non-caseating granulomatous inflammation is typical for sarcoidosis, a non-infectious process. Granulomas are a form of type IV hypersensitivity reaction. There are cytokines such as interferon gamma produced by lymphocytes that recruit blood monocytes and stimulate macrophages to develop a granulomatous response.

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 creatine kinase
- E Decreased platelet count
- F Increased serum cholesterol

(D) CORRECT. CK is an enzyme released from the damaged striated muscle. CK-MB would be more specific for cardiac muscle, while CK-MM mainly comes from skeletal muscle. Cell damage leads to leakage of intracellular contents, such as enzymes. Some enzymes are more specific for certain tissues to aid in diagnosis.

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

(D) CORRECT. Histamine, mainly released from mast cells in perivascular locations in the submucosa beneath the nasal respiratory epithelium, leads to vasodilation and fluid exudation. That is why people with allergies take antihistamines.

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

(B) CORRECT. Aspirin, indomethacin, and NSAIDS block the cyclo-oxygenase arm of the arachidonic acid pathway, which generates the prostaglandins that play a role in development of pain as a consequence of the inflammatory process. The inflammation here is minimal but widespread as a consequence of the overuse of the connective tissues in the arms.

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

(E) CORRECT. This is systemic anaphylaxis, a type I hypersensitivity reaction in which the antigen contacts preformed IgE antibody attached to mast cells, leading to mast cell degranulation with release of bioactive compounds such as histamine and production of symptoms. The initial response typically occurs within minutes.

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

(B) CORRECT. Viral illnesses, including those caused by common viral respiratory pathogens such as influenza, often produce chronic inflammation that is mainly interstitial in the lungs. The lack of an alveolar filling process results in the lack of a productive cough.

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

(A) CORRECT. The C3b fragment generated from the complement cascade serves as an effective opsonin, attaching to the bacteria so that phagocytes will find and engulf them more easily.

26. A 43-year-old woman has had nausea with vomiting persisting for the past 5 weeks. On physical examination there are no abnormal findings. She undergoes an upper GI endoscopy and gastric biopsies are obtained. The microscopic appearance of these biopsies shows mucosal infiltration by lymphocytes, macrophages, and plasma cells. Which of the following most likely caused her findings?

A *Staphylococcus aureus* septicemia

B Ingestion of chili peppers

C Diabetes mellitus

D Tuberculosis

E Infection with *Helicobacter pylori*

(E) CORRECT. This is a chronic inflammatory process, based upon the mononuclear inflammatory cell components present. *H. pylori* organisms live in the mucus above the gastric epithelium and release chemical substances that alter epithelial function and defenses, leading to gastritis. This organism does not directly infect or damage the epithelium, and its persistence leads to the chronic inflammation.

27. In an experiment, lymphatic channels are observed in normal soft tissue preparations. *Staphylococcus aureus* organisms are inoculated into the tissues and the immunologic response observed over the next 24 hours. Which of the following functions is most likely to be served by these lymphatics to produce a specific immune response to these organisms?

A Carry lymphocytes to peripheral tissue sites

B Remove extravascular tissue fluid

C Transport antigen presenting cells

D Serve as a route for dissemination of infection

E Provide an emigration point for neutrophils

(C) CORRECT. Antigen presenting cells such as dendritic cells and macrophages which have trapped antigen in peripheral tissues can be transported to lymph nodes where they encounter specific clones of memory

cells capable of responding to those specific antigens, and this typically happens within a day.

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

(D) CORRECT. FGF can stimulate all aspects of angiogenesis.

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

(C) CORRECT. A transudate resembles a filtrate of plasma and has few cells with very little protein and has a clear appearance.

30. 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

(C) CORRECT. Cell surface growth factor receptors recruit intracellular protein kinases that begin a sequence of events leading to cell division and growth.

31. 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

(C) CORRECT. About 70 to 80% of the tensile strength in the scar, compared to non-wounded skin, is reached at 3 months, which is about as much as will be obtained.

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

E Histamine

(D) CORRECT. Hageman factor (factor XII as measured in the intrinsic coagulation pathway) becomes activated upon contact with injured, exposed vascular basement membrane.

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

E Complement C3a

(A) CORRECT. Nitric oxide (NO) acts as a vasodilator. Small amounts released from endothelial cells causes vasodilation and prevents thrombosis. Macrophages release NO to kill bacteria, but large amounts released body-wide can cause hypotension and shock.

33. 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

(C) CORRECT. Although any foreign body will delay wound healing to some degree, the net effect of having sutures is to aid the process of healing more than to hinder it, since the sutures close the wound, so there is less space to fill in by granulation tissue, and less distance for cells to move.

34. A 24-year-old primigravida is late in the second trimester of pregnancy. She experiences the sudden onset of some cramping lower abdominal pain. This is immediately followed by passage of some fluid per vagina along with a foul-smelling discharge. The fetus is stillborn two days later. Examination of the placenta demonstrates extensive neutrophilic infiltrates in the chorion and amnion. Which of the following organisms is most likely to be responsible for these findings?

- A Mycobacterium tuberculosis
- B Herpes simplex virus
- C Escherichia coli
- D Treponema pallidum
- E Toxoplasma gondii

(C) CORRECT. She developed an acute chorioamnionitis, and bacterial infections that precede or follow premature rupture of membranes are most often to blame. Bacterial infections tend to elicit neutrophilic inflammatory responses.

35. 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

(A) CORRECT. Some persons have an exaggerated, inappropriate wound healing response with excessive collagenization.

36. 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
- E Granulomatous inflammation

(B) CORRECT. The neutrophils suggest an acute inflammatory process; the fluid is characteristic for an exudate. Such a large amount of purulent exudate in the pleural space can be termed an empyema.

38. A 52-year-old woman with no major medical problems takes a long airplane flight across the Pacific Ocean. Upon arrival at Sydney's Kingsford Smith airport following the flight from Los Angeles, she cannot put her shoes back on. There is no pain or tenderness. Which of the following is the most likely explanation for this phenomenon?

- A Activation of Hageman factor has led to bradykinin production.

B A lot of drinks were served in the first class section.
C Femoral vein thrombosis developed.
D A cellulitis developed in her legs.
E Venous hydrostatic pressure became increased.
(E) CORRECT. The longest non-stop flight in the world has its drawbacks. Extracellular fluid builds up when hydrostatic pressure is increased over a long time. Remaining upright and stationary in a cramped airplane predisposes to reduced venous and lymphatic return.

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
E Basophils
(C) CORRECT. Blood monocytes can migrate into tissues and become macrophages. Macrophages play an important role in delayed hypersensitivity reactions with cell-mediated immunity.

40. A 56-year-old man has had increasing difficulty breathing for the past week. On physical examination he is afebrile. Auscultation of his chest reveals diminished breath sounds and dullness to percussion bilaterally. There is 2+ pitting edema present to the level of his thighs. A chest radiograph reveals bilateral pleural effusions. Which of the following laboratory test findings is he most likely to have?

A Hypoalbuminemia
B Glucosuria
C Neutrophilia
D Anemia
E Hypernatremia
(A) CORRECT. The decrease in oncotic pressure from decreased serum albumin, the blood protein that accounts for most of the oncotic pressure, can be significant. This can be a cause for edema and fluid transudates. Too little circulating protein doesn't keep in or draw water into the vasculature

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A 4-year-old child has had a high-volume diarrhea for the past 2 days. On examination she is dehydrated. A stool sample examined by serologic assay is positive for rotavirus. She is treated with intravenous fluids and recovers. Which of the following components is found on intestinal cells and recognizes double-stranded RNA of this virus to signal transcription factors that upregulate interferon production for viral elimination?

Toll-like receptor

A 72-year-old man with severe emphysema has had worsening right ventricular failure for the past 5 years. For the past 4 days, he has had fever and increasing dyspnea. A chest radiograph shows an accumulation of fluid in the pleural spaces. Fluid obtained by thoracentesis has a specific gravity of 1.030 and contains degenerating neutrophils. The most likely cause of this fluid accumulation is due to changes in which of the following?

Vascular permeability

A 35-year-old man has had increasing dyspnea for the past 24 hours. A chest radiograph shows large, bilateral pleural effusions. Thoracentesis yields 500 mL of slightly cloudy yellow fluid from the right pleural cavity. Cytologic examination of the fluid shows many neutrophils, but no lymphocytes or RBCs. Which of the following mechanisms contributes most to the pleural fluid accumulation?

Endothelial contraction

A 6-year-old child has a history of recurrent infections with pyogenic bacteria, including *Staphylococcus aureus* and *Streptococcus pneumoniae*. The infections are accompanied by a neutrophilic leukocytosis. Microscopic examination of a biopsy specimen obtained from an area of soft tissue necrosis shows microbial organisms, but very few neutrophils. An analysis of neutrophil function shows a defect in rolling. This child's increased susceptibility to infection is most likely caused by a defect involving which of the following molecules?

Selectins

In an experiment, bacteria are introduced into a perfused tissue preparation. Leukocytes leave the vasculature and migrate to the site of bacterial inoculation. The movement of these leukocytes is most likely to be mediated by which of the following substances?

Chemokines

A 12-month-old boy with a 6-month history of repeated infections has had a fever and cough for the past 3 days. A Gram stain of sputum shows many gram-positive cocci in chains. CBC shows neutrophilia. Laboratory studies show that the patient's neutrophils phagocytose and kill organisms promptly in the presence of normal human serum, but not in his own serum. The neutrophils migrate normally in a chemotaxis assay. Which of the following is the most likely cause of this boy's increased susceptibility to infection?

Diminished opsonization

A 5-year-old child has a history of recurrent bacterial infections, including pneumonia and otitis media. Analysis of leukocytes collected from the peripheral blood shows a deficiency in myeloperoxidase. A reduction in which of the following processes is the most likely cause of this child's increased susceptibility to infections?

Hydroxy-halide radical (HOCl-) formation

In an experiment, neutrophils collected from peripheral blood are analyzed for a "burst" of oxygen consumption. This respiratory burst is an essential step for which of the following events in an acute inflammatory response?

Generation of microbicidal activity

A 4-year-old girl has had numerous infections with *Staphylococcus aureus* since infancy. Genetic testing shows a defect leading to a lack of $\beta 2$ integrin

production. Which of the following abnormalities of neutrophil function is most likely responsible for these clinical symptoms?

Inadequate adhesion on cytokine-activated endothelium

In an experiment, peripheral blood cells are isolated and placed into a culture medium that preserves their metabolic activity. Interferon- γ is added to this culture, along with viable *Escherichia coli* organisms. Which of the following blood cell types in this medium is the most likely to have bactericidal activity against *E. coli*?

Monocyte

A woman who is allergic to cats visits a neighbor who has several cats. During the visit, she inhales cat dander, and within minutes, she develops nasal congestion with abundant nasal secretions. Which of the following substances is most likely to produce these findings?

Histamine

In a 6-month randomized trial of a pharmacologic agent, one group of patients receives a cyclooxygenase-2 (COX-2) inhibitor, and a control group does not. Both groups of adult males had mild congestive heart failure and bilateral symmetric arthritis of small joints. Laboratory measurements during the trial show no significant differences between the groups in WBC count, platelet count, hemoglobin, and creatinine. The group receiving the drug reports subjective findings different from those of the control group. Which of the following findings was most likely reported by the group receiving the drug?

Reduced arthritis pain

A 19-year-old woman develops a sore throat and fever during the past day. Physical examination shows pharyngeal erythema and swelling. Laboratory findings include leukocytosis. She is given naproxen. Which of the following features of the acute inflammatory response is most affected by this drug?

Vasodilation

A 35-year-old woman takes acetylsalicylic acid (aspirin) for arthritis. Although her joint pain is reduced with this therapy, the inflammatory process continues. The aspirin therapy alleviates her pain mainly through reduction in the synthesis of which of the following mediators?

Prostaglandins

A 77-year-old woman experiences a sudden loss of consciousness, with loss of movement on the right side of the body. Cerebral angiography shows an occlusion of the left middle cerebral artery. Elaboration of which of the following mediators will be most beneficial in preventing further ischemic injury to her cerebral cortex?

Nitric oxide

A 95-year-old woman touches a pot of boiling water. Within 2 hours, she has marked erythema of the skin of the fingers of her hand, and small blisters appear on the finger pads. This has led to which one of the following inflammatory responses?

Serous inflammation

A 24-year-old, sexually active woman has experienced lower abdominal pain for the past day. Her temperature is 37.9° C, and on palpation, the left lower abdomen is markedly tender. Laboratory findings include a total WBC count of 29,000/mm³ with 75% segmented neutrophils, 6% bands, 14% lymphocytes, and 5% monocytes. Laparotomy reveals a distended, fluid-filled, reddened left fallopian tube that is about to rupture. A left salpingectomy is performed.

Which of the following is most likely to be seen on microscopic examination of the excised fallopian tube?

Liquefactive necrosis

A 68-year-old man has had worsening shortness of breath for the past week. On physical examination, his temperature is 38.3° C. On percussion, there is dullness over the left lung fields. Thoracentesis performed on the left pleural cavity yields 800 mL of cloudy yellow fluid that has a WBC count of 2500/mm³ with 98% neutrophils and 2% lymphocytes. A Gram stain of the fluid shows gram-positive cocci in clusters. Which of the following terms best describes the process occurring in his left pleural cavity?

Purulent exudate

An 87-year-old woman has had a cough productive of yellowish sputum for the past 2 days. On examination her temperature is 37° C. A chest radiograph shows bilateral patchy infiltrates. Her peripheral blood shows leukocytosis. A week later she is afebrile. Which of the following is the most likely outcome of her pulmonary disease?

Resolution

A 37-year-old man has had midepigastlic pain for the past 3 months. An upper gastrointestinal endoscopy shows a 2-cm, sharply demarcated, shallow ulceration of the gastric antrum. Microscopic examination of a biopsy from the ulcer base shows angiogenesis, fibrosis, and mononuclear cell infiltrates with lymphocytes, macrophages, and plasma cells. Which of the following terms best describes this pathologic process?

Chronic inflammation

A 65-year-old man develops worsening congestive heart failure 2 weeks after an acute myocardial infarction. An echocardiogram shows a markedly decreased ejection fraction. Now, capillaries, fibroblasts, collagen, and inflammatory cells have largely replaced the infarcted myocardium. Which of the following inflammatory cell types in this lesion plays the most important role in the healing process?

Macrophages

A 9-year-old boy has had a chronic cough and fever for the past month. A chest radiograph shows enlargement of hilar lymph nodes and bilateral pulmonary nodular interstitial infiltrates. A sputum sample contains acid-fast bacilli. A transbronchial biopsy specimen shows granulomatous inflammation with epithelioid macrophages and Langhans giant cells. Which of the following mediators is most likely to contribute to giant cell formation?

Interferon- γ

A 32-year-old woman has had a chronic cough with fever for the past month. On physical examination, her temperature is 37.5° C. A chest radiograph shows many small, ill-defined nodular opacities in all lung fields. A transbronchial biopsy specimen shows interstitial infiltrates with lymphocytes, plasma cells, and epithelioid macrophages. Which of the following infectious agents is the most likely cause of this appearance?

Mycobacterium tuberculosis

One month after an appendectomy, a 25-year-old woman palpates a small nodule beneath the skin at the site of the healed right lower quadrant sutured incision. The nodule is excised, and microscopic examination shows macrophages, collagen deposition, small lymphocytes, and multinucleated

giant cells. Polarizable, refractile material is seen in the nodule. Which of the following complications of the surgery best accounts for these findings?

Granuloma formation

An 8-year-old girl has had difficulty swallowing for the past day. On examination, her pharynx is swollen and erythematous with an overlying yellow exudate. Laboratory studies show neutrophilia. *Streptococcus pyogenes* (group A streptococcus) is cultured from her pharynx. Which of the following substances is most likely to increase in response to pyrogens released by this organism?

Prostaglandins

A 41-year-old man has had a severe headache for the past 2 days. On examination, his temperature is 39.2° C. A lumbar puncture is performed, and the cerebrospinal fluid obtained has a WBC count of 910/mm³ with 94% neutrophils and 6% lymphocytes. Which of the following substances is the most likely mediator for the fever observed in this man?

Tumor necrosis factor (TNF)

A 43-year-old man with a ventricular septal defect has had a cough and fever for the past 2 days. On examination, he has a temperature of 37.6° C and a cardiac murmur. A blood culture grows *Streptococcus, viridans* group. His erythrocyte sedimentation rate (ESR) is increased. Microbial cells are opsonized and cleared. Which of the following chemical mediators is most important in producing these findings?

C-reactive protein

In an experiment, a group of test animals is infected with viral hepatitis. Two months later, complete recovery of the normal liver architecture is observed microscopically. A control test group is infected with bacterial organisms, and after the same period of time, fibrous scars from resolving hepatic abscesses are seen microscopically. Which of the following factors best explains the different outcomes for the two test groups?

Injury to the connective tissue framework

A 51-year-old woman tests positive for hepatitis A antibody. Her serum AST level is 275 U/L, and ALT is 310 U/L. One month later, these enzyme levels have returned to normal. Which phase of the cell cycle best describes the hepatocytes 1 month after her infection?

G0

A 54-year-old man undergoes laparoscopic hernia repair. In spite of the small size of the incisions, he has poor wound healing. Further history reveals that his usual diet has poor nutritional value and is deficient in vitamin C.

Synthesis of which of the following extracellular matrix components is most affected by this deficiency?

Collagen

A 20-year-old woman undergoes cesarean section to deliver a term infant, and the lower abdominal incision is sutured. The sutures are removed 1 week later. Which of the following statements best describes the wound site at the time of suture removal?

Collagen degradation exceeds synthesis

A 40-year-old man underwent laparotomy for a perforated sigmoid colon diverticulum. A wound infection complicated the postoperative course, and surgical wound dehiscence occurred. Primary closure was no longer possible, and the wound "granulated in." Six weeks later, the wound is only 10% of its

original size. Which of the following processes best accounts for the observed decrease in wound size over the past 6 weeks?

Myofibroblast contraction

A 23-year-old woman receiving corticosteroid therapy for an autoimmune disease has an abscess on her upper outer right arm. She undergoes minor surgery to incise and drain the abscess, but the wound heals poorly over the next month. Which of the following aspects of wound healing is most likely to be deficient in this patient?

Collagen deposition

A 58-year-old man had chest pain persisting for 4 hours. A radiographic imaging procedure showed an infarction involving a 4-cm area of the posterior left ventricular free wall. Laboratory findings showed serum creatine kinase of 600 U/L. Which of the following pathologic findings would most likely be seen in the left ventricular lesion 1 month later?

Fibrous scar

I) MULTIPLE CHOICE QUESTIONS

1- Which of the following factors participates in the formation of inflammatory fluid exudate:

- a)increased intravascular osmotic pressure
- b)Increased vascular permeability**
- c)Vasoconstriction
- d)Decreased osmotic pressure of the interstitial tissue
- e)All of the above.

2- Which of the following is an effect of chemical mediators :

- a)increased vascular permeability. b)Chemotaxis
- c)Fever
- d)All of the above**
- e)None of the above

3- Which of the following is true about vascular stasis in acute inflammation:

- a)It is mainly induced by vasoconstriction.
- b)It mainly occurs after emigration of leucocytes.
- c)It may lead to thrombosis**
- e)None of the above
- d)All of the above

4- Which of the following statements is true about the cellular phase of acute inflammation:

- a)Opsonins play an important role in the process of pavementing
- b)Neutrophils and monocytes emigrate at the same time.
- c)Emigration of leucocytes is followed by leucopenia**
- d)Giant cells are formed by fusion of neutrophils
- e)Bacilli are more chemotactic to macrophages, while cocci mainly attract neutrophils

5- Which of the following is true about fibrin:

- a)Deposition of fibrin in inflammatory conditions is known as fibrosis
- b)Fibrin plays important functions in inflammation & repair**
- c)Cellulitis is characterized by excess fibrin deposition
- d)All of the above
- e)None of the above

6- Which of the following is true about chemotaxis:

- a)This is diversion of leucocytes out of the axial column of blood ,prior to their emigration.
- b)Typhoid bacilli are strongly chemotactic to neutrophils.
- c)Complement components are important chemotactic factors.**
- d)All of the above
- e)None of the above

7- Which of

the following statements is true about giant cells in inflammation:

- a) They are most commonly seen in suppurative inflammation.
- b) They have a weaker phagocytic capacity than macrophages.
- c) **They are more commonly seen in granulomas than in chronic nonspecific inflammation**
- d) All of the above
- e) None of the above

8- Which of the following statements is true about abscess:

- a) It is most commonly caused by Streptococcal infection.
- b) Wall of the abscess is characterized by numerous lymphocytes, plasma cells & giant cells
- c) **Lung abscess may lead to gangrene.**
- d) Brain abscess is precancerous
- e) All of the above

9- All of the following are features of cellulitis except:

- a) Caused by Streptococcus hemolyticus infection.
- b) Pus is thin and sanguinous.
- c) **The main inflammatory cells are lymphocytes and plasma cells.**
- d) It mainly occurs in loose tissues.
- e) It is most common in diabetics.

10- Which of the following statements is true for neutrophils:

- a) **They are the first cells to emigrate in acute inflammation**
- b) They are the most predominant cells in chronic inflammation.
- c) The most important chemotactic factors for neutrophils are derived from bacilli.
- d) They efficiently engulf foreign bodies.
- e) They can give rise to giant cells.

11- Which of the following statements is not true for macrophages:

- a) They are derived from blood monocytes
- b) They produce some cytokines such as TNF and interleukins
- c) They produce growth factors involved in the process of healing
- d) They are involved in remodeling of scar by secreting collagenases
- e) **Their capacity to engulf tubercle bacilli and necrotic cells is less than that of neutrophils.**

12- Which of the following statements is true for chronic inflammation:

- a) **Giant cells are common, particularly in granulomas.**
- b) Chronic inflammation is always preceded by acute inflammation
- c) Lymphocytes are rarely seen in chronic inflammation.
- d) The course of most chronic inflammations is resolution.
- e) All of the above.

13- Which of the following is not true for epithelioid cells

- a) **They are derived from epithelial cells.**
- b) They are altered macrophages
- c) They can be seen in case of sarcoidosis.
- d) They can give rise to giant cells
- e) They are more commonly seen in proliferative than exudative tissue reaction of tuberculosis

14- Which of the following granulomatous lesions may be associated with marked necrosis:

- a) Silicosis
- b) Foreign body granuloma
- c) Sarcoidosis

- d) Tuberculosis.
- e) Crohn's disease

15-Which of the following features characterizes serofibrinous inflammation:

- a) **It most commonly affects the pleura & peritoneum**
- b) It may affect the oral mucosa in case of diphtheria
- c) It is characterized by excess mucous production
- d) It is characterized by the most efficient phagocytosis among all types of inflammation
- e) All of the above

16-Which one of the following is not an acceptable characteristic of granuloma:

- a) It predominantly consists of a nodular collection of macrophages.
- b) Epithelioid cells are common.
- c) Giant cells may develop.
- d) **Neutrophils are always present**
- e) Bilharziasis may be associated with granulomas.

17-Which of the following is not a feature of acute inflammation:

- a) **Persistent vasoconstriction.**
- b) Vasodilatation.
- c) Increased vascular permeability.
- d) Vascular stasis.
- e) Emigration of leucocytes.

18-Which of the following is not a function of fibrin:

- a) **Opsonization**
- b) Sealing of bleeding vessels
- c) Facilitation of movement of inflammatory cells
- d) Localization of inflammatory fields
- f) Facilitation of movement of fibroblasts during repair

19-Which of the following cells engulf fibrin:

- a) Neutrophils
- b) Eosinophils
- c) **Macrophages**
- d) Lymphocytes
- f) Plasma cells

20-Which of the following is true about pseudomembranous inflammation :

- a) A severe type of suppurative inflammation affecting mucous membranes.
- b) Accompanied by excessive mucus production.
- c) Characterized by an exudate rich in eosinophils.
- d) All of the above
- e) **None of the above.**

21-Which of the following is true about activation of phospholipase C of phagocytic cells:

- a) It provides the phagocytic cells with phospholipids.
- b) It provides the phagocytic cells with energy
- c) **It hydrolyses the release of calcium and enhances cell mobility.**
- d) All of the above.
- e) None of the above.

22-Which of the following statements is true:

- a) Platelet derived growth factor is produced by platelets and stored in macrophages.
b) Transforming growth factor B has a growth inhibition action.
c) Growth factors are essential to stimulate the proliferation of skeletal muscle cells.
d) All of the above.
e) None of the above.

23-Which of the following statements is true: a) Hepatic bilharziasis disturbs the lobular framework and leads to cirrhosis.

- b) Wound contraction by myofibroblasts is an important feature of 1ry union of wounds. c) Type II collagen is the most important type of collagen deposited in wound healing.
d) All of the above
e) None of the above.

24-If the following events were placed in their most probable order of occurrence following a surgically stitched skin wound, which would come fourth?:

- a) Blood clot formation.
b) Growth of granulation tissue.
c) Epidermal regeneration.
d) Deposition of collagen type I
e) Deposition of collagen type III

25-Which of the following statements is true about permanent cells:

- a) Injury of these cells may be sometimes followed by their regeneration.
b) They can give rise to tumors
c) Fibroblasts are examples of permanent cells.
d) All of the above
e) None of the above

26-Which of the following cells is labile:

- a) Liver cells.
b) Lymphoid cells
c) Fibroblasts
d) Nerve cells
e) None of the above

27-Which of the following factors may adversely affect healing of bone: a) Glucocorticoid therapy

- b) old age
c) Soft tissue interposition between the fracture ends.
d) All of the above
e) None of the above.

28-Which of the following statements is true about peripheral nerve injury:

- a) Following injury of a peripheral nerve, the nerve cells die & healing occurs by gliosis
b) Schwann cells are sensitive to injury and are therefore completely lost after nerve injury.
c) The earliest stage in healing of peripheral nerve injury is myelin deposition.
d) Complete regeneration is possible in optimal conditions
e) Healing of nerves is always accompanied by development of traumatic neuroma.

29-Which of the following statements is true about healing of skin wounds.

- a) Epidermal regeneration occurs in primary union, but not in secondary union
b) Wound contraction mainly occurs in

secondary union

- c)Collagens deposited during the process of healing are mainly types II & IV
- d)All of the above
- e)None of the above

30- Which of the following injuries can heal by complete regeneration:

- a)Peripheral nerve injury
- b)Acute viral hepatitis
- c)Bone fracture
- d)Epidermal injury
- e)All of the above**

31-Which of the following statements is true for hepatic steatosis :

- a) May be caused by alcohol intake.
- b)May occur in cases of hepatitis C.
- c)May be folowed by cirrhosis.
- d)All of the above.**
- e)None of the above

32-The following are features of apoptosis except:

- a)It is always caused by irritants such as anoxia, bacterial infections and alcohol.**
- b)It is characterized by fragmentation of nuclear DNA.
- c)It is characterized by formation of cell membrane blebs.
- d)It is characterized by transformation of the affected cell into apoptotic bodies.
- e)Phagocytosis of the apoptotic bodies is common.

33-Caseous necrosis is characterized by all of the following features except:

- a)Cheese-like material.
- B)Commonly seen in tuberculous lesions.
- c)The structural outlines of the necrotic cells are preserved.**
- d)It represents partially liquified coagulative necrosis.
- e)Microscopically appears as amorphous eosinophilic granular debris.

34-Allof the following changes can be seen in necrotic cells except:

- a)Pyknosis
- b)Mitosis**
- c)Karyorrhesis
- d)Karyolysis
- e)Cytomegaly

35-Which of the following conditions is characterized by liquefactive necrosis:

- a)Lung infarction
- b)Cerebral infarction**
- c)Pulmonary tuberculosis
- d)All of the above
- e)None of the above

36-Which of the following statements is true for dystrophic calcification :

- a)It is due to hypercalcemia.
- b)It affects healthy tissues.
- c)It can be seen in tubeculosis.**

- d)It commonly occurs in teeth and bone
- e)It is more common in arterial than venous thrombi

37- Which of the following statements is true for metastatic calcification

- a)It may occur in cases of hyperparathyroidism.**
- b)It is seen in metastatic tumors.
- c)Calcified thrombi represent a type of metastatic calcification
- d)All of the above
- e)None of the above

38-Which of the following statements is not true for amyloidosis:

- a)Amyloid is predominantly a fibril protein. b)Macrophages may play an important role in systemic amyloidosis.
- c)Sudan III and osmic acid can specifically stain amyloid**
- d)Amyloid is mainly deposited within the walls of small blood vessels.
- e)Amyloidosis may lead to Addison's disease.

39-The following are causes of systemic amyloidosis except:

- a)Acute suppurations.**
- b)Tuberculosis.
- c)ulcerative colitis.
- d)Rheumatoid arthritis.
- e)Multiple myeloma.

40-Which of the following types of amyloid affection produces the most serious effects:

- a)Amyloid sago spleen
- b)Hepatic amyloidosis
- c)Renal amyloidosis**
- d)Amyloid diffuse spleen
- e)Cutaneous amyloidosis.

41-In all of the following conditions the amyloid fibril protein is AA except:

- a)Ulcerative colitis
- b)Multiple myeloma**
- c)Tuberculosis
- d)Chronic lung abscess
- e)Hodgkin's disease.

42-Which of the following is true about amyloid deposited within medullary carcinoma of thyroid:

- a)The amyloid protein is secreted by macrophages within the thyroid gland.
- b)The amyloid protein is produced by tumor cells.**
- c)It may be accompanied by renal or hepatic amyloidosis.
- d)The amyloid protein is AL
- e) None of the above

43-Which of the following conditions may be accompanied by abnormal melanin deposition:

- a)Multiple neurofibromatosis**
- b)Brown atrophy of the heart
- c)Melanosis coli
- d)Leukoderma

e)All of the above

44-Which of the following lesions may exhibit cellular or extracellular hyalinosis: a)Uterine leiomyoma

b)Alcoholic hepatitis

c)Keloid

d)Chronic glomerulonephritis

e)All of the above

45-Hyperplasia is characterized by all of the following except:

a)It is always accompanied by dysplasia.

b)It may be caused by hormonal abnormalities.

c)It is sometimes precancerous.

d)Growth factors may be involved in the mechanism of hyperplasia.

e)It may affect the bone marrow following hemorrhage.

46-Which of the following features is true for squamous metaplasia

a)it may be related to vitamin A deficiency.

b)It may be followed by leukoplakia.

c)It is a common feature of bilharzial cystitis.

d)it predisposes to squamous cell carcinoma.

e)All of the above

47-Which of the following statements is true for dysplasia:

a)It is precancerous

b)It is common in case of bilharzial cystitis c)It may affect the cervical mucosa in chronic cervicitis,

d)All of the above .

e)None of the above.

48-Which of the following statements is true for carcinoma insitu:

a)It may appear grossly as an irregular ulcer with everted edges.

b)It is characterized by cellular atypia accompanied by basement membrane invasion.

c)It predisposes to the development of fibrosarcoma.

d)All of the above.

E)None of the above.

49-Which of the following statements is true about the spread of malignant tumors:

a)Basal cell carcinoma commonly spreads by lymphatics and rarely by blood.

b)Cathepsin B and collagenase type IV are involved in the mechanism of spread.

c)Cartilage and periosteum can be easily penetrated by malignant cells.

d)All of the above

e)None of the above.

50-Which of the following statements is true for sarcomas:

a)Malignant mesenchymal tumors.

b)Much less common than carcinoma

c) Distant spread is predominantly by the hematogenous route.

d)All of the above

e)None of the above.

51-Which of the following statements is true for locally malignant tumors:

a) They lack the microscopic features of malignancy.

B) Rodent ulcer and giant cell tumor of bone are common examples

c) They are commonly capsulated.

d) All of the above.

e) None of the above.

52-Which of the following benign tumors does not affect skin and subcutaneous tissues:

a) Villous papilloma.

b) Lipoma.

c) Leiomyoma.

d) Hemangioma

e) All of the above.

53-Which of the following statements is true for squamous cell carcinoma:

a) It can affect the oesophagus.

b) The differentiated types are characterized by cell nest formation.

c) It can spread by local and distant routes.

d) It may affect the skin due to prolonged exposure to sun.

e) All of the above.

54-Which of the following statements is true for transitional cell carcinoma:

a) It may occur in papillary and non-papillary forms with better prognosis for the papillary.

b) It may occur in the skin on top of leukoplakia

c) It commonly spreads by the transperitoneal route.

d) Distant spread occurs early by blood.

e) All of the above.

55-Which of the following statements is true for signetring cell carcinoma:

a) It commonly occurs in the gastrointestinal tract."

c) It is a locally malignant tumor.

d) It has a better prognosis than most other types of carcinoma.

e) Tumor cells are positively stained by Sudan III or Osmic acid

e) All of the above.

56-Which of the following statements is true for osteoid osteoma:

a) It occurs most commonly in the skull.

b) Its size does not usually exceed 4 cm in diameter.

c) It very commonly changes into osteosarcoma.

d) All of the above

e) None of the above.

57-Which of the following statements is true for leiomyoma:

a) It is a benign tumor of skeletal muscle.

b) It commonly arises in females after the menopause.

c) It commonly changes into leiomyosarcoma.

d) All of the above

e) None of the above

58-Which of the following tumors may occur in the heart:

a) Rhabdomyosarcoma.

- b)Myxoma.
- c)Rhabdomyoma.
- d)All of the above.**
- e)None of the above.

59-Which of the following statements is true for osteochondroma:

- a)It always arises above the age of 20 years.
- B)It grossly appears as a hemispherical mass arising from the skull.
- c)Multiple tumors may occur as a hereditary autosomal dominant disease.**
- d)All of the above
- e)None of the above.

60-Which of the following statements is true about lipoma and leiomyoma:

- a)They are very common benign tumors. b)Malignant transformation is rare.
- c)The skin (including dermis and subcutaneous tissue) may be a site for both tumors.
- d)All of the above.**
- e)None of the above

61-Which of the following statements is true for osteblastoma:

- a)It is a malignant tumor of bone.
- B)It is histologically identical to osteoid osteoma.**
- c)Short bones are the most common site. d)All of the above
- e)None of the above

62-Which of the following statements is true for neoplasia:

- a)All neoplasms can spread by lymphatics & blood.
- b)Neoplasms can arise from labile & stable cells but not from permanent cells. c)Neoplasms are reversible if their evoking stimuli are stopped.
- d)All of the above
- e)None of the above**

63-All of the following neoplasms are benign except:

- a)Nodular melanoma.**
- b) Dermoid cyst
- c) Rhabdomyoma.
- d) Osteochondroma
- e) Villous papilloma

64-Which of the following statements is true for acquired nevi:

- a)They are rare skin lesions caused by melanocyte proliferation.
- b)They very commonly undergo malignant transformation.
- c)They exist at birth and may be very large.
- d)All of the above
- e)None of the above.**

65-Which of the following statements is true for lentigo maligna:

- a)It is considered a type of melanoma insitu. b)The most common presentation is a pigmented macule in the face.
- c)It mainly occurs in the elderly and may become invasive after many years
- d)All of the above**
- e)None of the above

66-Which of the following statements is true for nodular melanoma:

- a)It is a benign melanocytic tumor.
- b)it is less aggressive than superficial spreading melanoma.
- c)It predominantly grows in a radial fashion d)All of the above
- e)None of the above

67-Which of the following tumors is benign:

- a)Dermoid cyst.
- b)Immature teratoma.
- c)Nephroblastoma
- d)All of the above
- e)None of the above

68-Which of the following statements is true for teratoma:

- a)It is a composite tumor that may arise from totipotent cells.
- b)The most common site is the ovary.
- c)It may arise in the anterior mediastinum or retroperitoneum.
- d)All of the above
- e)None of the above

69-Which of the following statements is true for ovarian dermoid cyst:

- a)It is a post operative complication.
- b)It is a malignant embryonic tumor.
- c)It is a cystic form of mature teratoma.
- d)It may contain mature organs as kidney and eye
- e)None of the above.

70-Which of the following statements is true for hamartoma:

- a)It is a benign bone tumor commonly affecting the humerus.
- b)It is a benign tumor that arises in the breast around the age of 30 years.
- c)It is a developmental tumor-like malformation.
- d)It is considered a type of teratoma.
- e)It is an embryonic tumor

71-Which of the following statements is not true about distant metastases:

- a)Spleen is among the most commonly affected sites.
- b)Histology of metastatic tumors usually resembles that of the primary tumor. c)Omental metastases are commonly accompanied by hemorrhagic ascites d)Skeletal muscles and intestine are rarely affected by metastases.
- e)Lungs and liver are common sites for metastases.

72-Which of the following statements is not true about bone metastases:

- a)It is common in breast cancer.
- b)It may be osteolytic or osteosclerotic."
- c)It may lead to pathological fracture..
- d) It is a common cause of polycythaemia
- e)It is more common in ends of long bones than in their shafts

73-All of the following tumors are invasive except:

- a)Rodent ulcer
- b)Osteoblastoma

- c)Hepatoblastoma
- d)Immature teratoma
- e)Nodular melanoma

74-Which of the following factors can activate the development of oncogenes: a)Chromosomal translocations

- b)Point mutations
- c)Gene amplification
- d)All of the above**
- e)None of the above

75-Which of the following statements is true about carcinoma in situ :

- a)it is a locally malignant tumor characterized by direct spread without distant spread
- b)it is a non-invasive malignant change within the epithelium, detected microscopically**
- c)It is a microscopic malignant intraepithelial change that invades the basement membrane
- d)It is a secondary tumor caused by distant spread of carcinoma
- e)It leads to cachexia

76-Which of the following is a serum marker of hepatic carcinom a

- a)CEA
- b)S100 protein
- c)Alpha fetoprotein**
- d)All of the above
- e)None of the above

77-Which of the following statements is true:

- a)Liver cirrhosis is precancerous.
- b)Cancer may have genetic predisposition
- C)Aniline dye is a chemical carcinogen related to bladder caner.
- d)Asbestos is a carcinogen causing mesothelioma.
- e)All of the above**

79-Which of the following statements is true for hamartoma:

- a)It is a benign bone tumor commonly affecting the humerus.
- b)It is a benign tumor that arises in the breast around the age of 30 years.
- c)It is a developmental tumor-like malformation.**
- d)It is considered a type of teratoma.
- e)None of the above.

80-Which of the following organs is most commonly affected by metastases in case of gastric carcinoma :

- a)Pancreas
- b)Liver**
- c)Intestine
- d)Brain
- e)Bones

81-Which of the following malignant tumors is not commonly associated with lymph node metastases :

- a)Giant cell tumor of bone

- b)Fibrosarcoma
- c)Osteosarcoma
- d)Leiomyosarcoma
- e)All of the above.

82-Which of the following statements is not true about irradiation:

- a)It is useful in treatment of germ cell tumors of testis and ovary
- b)It can cause tumors by acting as a physical carcinogen
- c)It is ideal for treatment of sarcomas
- d)It can lead to leucopenia or leukemia
- e)It may lead to vascular thrombosis

83-Which of the following statements is not true for thrombosis:

- a)It predominantly consists of a network of fibrin & blood cells without platelets.
- b)It is commonly caused by endothelial injury.
- c)It may be a complication of varicose veins.
- d)It is more common in females using oral contraceptives than in nonuser females.
- e)All of the above.

84) Which of the following statements is true about endothelial injury:

- a)It enhances thrombosis by exposure of subendothelial collagen to which platelets stick
- b)It enhances thrombosis by release of thrombotic factors as factor VIII
- c)It may be due to trauma
- d) All of the above
- e)None of the above

85-Which of the following conditions can lead to thrombosis:

- a)Polycythaemia
- b)Tissue irradiation
- c)Puerperal sepsis
- d)All of the above
- e)None of the above

86-Which of the following is true about thrombophlebitis

- a)It is always septic.
- b)it may affect inflamed arteries.
- c)It may lead to pyemia.
- d)All of the above
- e)None of the above.

87-Which of the following statements is true about vascular thrombi.

- a)All thrombi are occluding
- b)All thrombi are septic
- c)All thrombi undergo embolization
- d)All of the above.
- e)None of the above

88-Which of the following statements is true about phlebothrombosis:

- a)It may lead to oedema.
- b)It is due to inflammation of the affected vein as in cases of cellulitis.
- c)it is non-occlusive venous thrombosis; that does not lead to a propagating thrombus
- d)All of the above

e)None of the above.

89-Which of the following statements is true about the fate of thrombosis:

- a)The effects of thrombosis may be ameliorated due to thrombus lysis or recanalization
- b)Thrombus may become calcified.
- c)Embolism may follow thrombosis
- d)Thrombosis may lead to ischemia.
- e)All of the above.**

90-Which of the following statements is true about pulmonary embolism.

- a)Lung infarction always develops in these cases
- b)Emboli may be derived from left atrial thrombi.
- c)It may occur after surgery due to thrombosis of leg veins.**
- d)All of the above
- e)None of the above

91-Which of the following statements is true for amniotic fluid embolism:

- a)It is most common in cases of fetal anomalies
- b)It occurs during labour**
- c)It is often a mild condition causing no serious effects
- d)All of the above
- e)None of the above.

92-Which of the following statements is true about gas embolism:

- a)It is the most common complication of gas gangrene
- b)It may occur in divers if they are decompressed too quickly**
- c)It may be caused by penetrating injuries of the abdomen.
- d)All of the above
- e)None of the above

93-Which of the following statements is true about infarction:

- a)It rarely affects the heart due to excellent coronary artery collateral circulation.
- b)Renal infarction is a liquefactive type necrosis
- c)All infarcts are centrally located within the affected organ
- d)All of the above
- e)None of the above**

94-Which of the following types of infarction may be followed by gangrene:

- a)Intestinal infarction**
- b)Cerebral infarction
- c)Myocardial infarction
- d)All of the above
- e)None of the above

95-Which of the following statements is true for senile gangrene:

- a)It is characterized by marked rapid putrefaction.
- b)It most commonly affects the upper limbs due to venous occlusion
- c)It is characterized by a prominent line of demarcation**
- d)All of the above
- e)None of the above

96-Which of the following statements is true for gangrene caused by intussusception

- a)It affects the intestine and represents a type of wet gangrene.
- b)It is characterized by a prominent line of demarcation.
- c)It is accompanied by insignificant toxaemia.
- d)All of the above
- e)None of the above

97-Which of the following statements is true about phlebothrombosis:

- a)It may lead to oedema.
- b)It is due to inflammation of the affected vein as in cases of cellulitis.
- c)It does not lead to a propagating thrombus
- d)All of the above
- e)None of the above.

98-Which of the following statements is true for gas gangrene:

- a)It is caused by contamination of superficial wounds with Clostridium tetani
- b)It is characterized by mild toxemia caused by bacterial endotoxins.
- c)It is characterized by prominent lines of demarcation and separation
- d)All of the above
- e)None of the above

99-Which of the following statements is true for heart failure cells:

- a)They are pulmonary macrophages engulfing hemosiderin in cases of lung congestion
- b)They are macrophages engulfing necrotic material in case of myocardial infarction.
- c)They are dead myocardial cells caused by heart failure.
- d)They are stem cells that regenerate the myocardium in case of heart failure
- e)None of the above

100-Which of the following statements is true for chronic general venous congestion

- a)It is caused by right sided heart failure.
- b)It leads to nutmeg appearance of the liver.
- c)It is characterized by generalized oedema.
- d)All of the above
- e)None of the above.

101-Which of the following factors does not lead to oedema.

- a)Increased plasma colloid osmotic pressure
- b)Increased tissue osmotic pressure
- c)Increased capillary permeability
- d)Increased capillary hydrostatic pressure.
- e)Malignant permeation of lymphatics

102-The following types of oedema are pitting except:

- a)Oedema due to venous thrombosis
- b)oedema caused by filariasis
- c)Cardiac oedema
- d)Nutritional oedema
- e)Nephrotic oedema

103-The following statements are true for shock except :

- a)Cerebral infarction may occur
- b)The blood pressure is elevated

- c)The lungs may show diffuse alveolar damage-
- d)Loss of adrenal lipids is an important feature.
- e)Shock may lead to acute renal failure.

104-Which of the following statements is true for pyemic abscess:

- a)A single abscess
- b)Centrally located within the affected organ
- c)May develop in cases of acute infective endocarditis.**
- d)All of the above
- e)None of the above.

105-Which of the following statements is true for septicemia:

- a)It is a common complication of tuberculosis due to blood spread.
- b)It is a common cause of subacute infective endocarditis
- c)Acute splenomegaly is a common feature**
- d)All of the above
- e)None of the above

106-Which of the following statements is true for bacteraemia

- a)It commonly leads to acute adrenal insufficiency
- b)it may follow tooth extraction**
- c)It may lead to development of pyemic abscesses
- d)All of the above
- e)None of the above

107-All of the following is true about tubercle bacilli except:

- a)They secrete powerful exotoxins.**
- b)They have a lipid capsule.
- c)They cannot be digested by neutrophils.
- d)They contain a protein that causes hypersensitivity reactions.
- e)They can contaminate dust, resist drying and remain viable for long periods.

108-Which of the following is not true for exudative tissue reaction in tuberculosis:

- a)It most commonly affects the serous membranes.
- b)It is characterized by outpouring of fluid exudate containing fibrinogen.
- c)It is characterized by cellular exudate poor in epithelioid cells & Langhan's giant cells
- d)It is the usual type seen in primary pulmonary tuberculous complex.**
- e)The exudate is often rich in lymphocytes.

109-Which of the following statements is true for Lupus vulgaris

- a)It is an autoimmune collagen disease
- b)It is a form of cutaneous tuberculosis.**
- c)It most commonly affects the skin of the lower limbs.
- d)It is commonly associated with renal failure e)None of the above

110-Which of the following statements is true for primary intestinal tuberculosis:

- a)It is caused by ingestion of bovine or human tubercle bacilli**
- b)It is mainly seen in adults .
- c)Mesenteric lymph node affection is minimal
- d)All of the above
- e)None of the above

111-Intestinal tuberculous ulcers are characterized by all of the following except:

- a)They have ragged undermined edges.
- b)They are longitudinally arranged in the ileum.**
- c)They are mainly seen in cases of secondary intestinal tuberculosis.
- d)They may be accompanied by intestinal fistulae
- e)They may be complicated by peritonitis.

112-Which of the following is true about angiogenesis:

- a)It is an important feature of granulation tissue
- b)It occurs in tumors in response to an angiogenesis factor
- c)It does not occur in tubercles and this participates in the mechanism of caseation.
- d)All of the above**
- e)None of the above

113-Which of the following is true about chronic fibrocaceous pulmonary tuberculosis a)It is a form of secondary pulmonary tuberculosis
b)It is characterized by cavitary lesions; mostly apical
c)It may be complicated by secondary intestinal tuberculosis
d)It may be complicated by systemic amyloidosis
e)All of the above

114-Which of the following is true about tuberculous lymphadenitis:
a)It is more common in secondary than primary tuberculosis.
b)It may be manifested by lymph node matting and cold abscess formation.
c)It most commonly affects the inguinal lymph nodes.
d)The lesions are always localized with no subsequent spread of the disease.
e)All of the above

115-Which of the following is true about tuberculous peritonitis
a)It may present with serous effusion.
b)It may be present with frozen abdomen. c)It may lead to intestinal obstruction
d)It may be a complication of primary or secondary intestinal tuberculosis
e)All of the above.

116-Which of the following is true about tuberculous epididymitis:
a)It may be due to blood-borne infection
b)It may lead to a posterior scrotal sinus
c)Bilateral cases may lead to obstructive azoospermia.
d)It may be accompanied by tuberculous orchitis
e)All of the above

117-The following are characters of C.S.F in case of tuberculous meningitis except: a)High CSF tension.
b)High sugar and chloride content
c)High protein content
d)A large number of lymphocytes
e)Culture for mycobacteria may be positive.

118-Which of the following factors is responsible for paraplegia in Pott's disease: a)Ischemic injury of spinal cord due to end arteritis
b)Traumatic injury of spinal cord due to vertebral fracture
c)Compression of spinal cord by caseous collections
d)Vascular thrombosis
e)All of the above

119-Which of the following is not a feature of tuberculous arthritis
a)It most commonly affects the hip and knee joints
b)It most commonly affects young ages before the age of 25 years.
c)It may be accompanied by joint effusion.
d)The articular cartilage is not affected.
e)Fibrous ankylosis may occur.

120-Which of the following diseases may be accompanied by sinus formation:
a)Actinomycosis

- b) Carbuncle
- c) Mycetoma
- d) Tuberculous arthritis
- e) All of the above**

121-All of the following diseases may lead to formation of fistulae except:

- a) Perianal abscess
- b) Intestinal tuberculosis
- c) Bilharzial cystitis
- d) Lupus vulgaris**
- e) Urinary bladder carcinoma

122-Which of the following diseases may lead to urinary bladder ulceration: a) Bilharzial cystitis

- b) Tuberculous cystitis
- c) Transitional cell carcinoma
- d) Squamous cell carcinoma
- e) All of the above**

123-Which of the following is true about Pott's disease:

- a) It is blood-borne tuberculosis of vertebrae.**
- b) It spares the intervertebral discs because they are avascular.
- c) It leads to paraplegia in all of the cases.
- d) It commonly leads to lordosis
- e) All of the above

124-Which of the following statements is true about leprosy:

- a) Tuberculoid leprosy is more aggressive than lepromatous leprosy.
- b) Lepra cells are epidermal cells infected by lepra bacilli
- c) Skin ulceration is a common feature of lepromatous leprosy**
- d) All of the above
- e) None of the above

125-All of the following are features of chancre except:

- a) It represents the primary stage of syphilis
- b) it is a painful papule**
- c) It may occur in the genitalia
- d) It may occur in extragenital sites
- e) It may be accompanied by lymph node enlargement

126-Which of the following statements is true about syphilitic affection of the tongue:

- a) Tongue lesions may develop in all stages.
- b) Syphilitic affection may be in the form of leukoplakia
- c) Syphilitic affection may be in the form of ulceration
- d) Syphilitic affection may be precancerous.
- e) All of the above**

127-Which of the following statements is not true about gumma:

- a) This lesion develops in the secondary stage of syphilis**
- b) it can affect the interventricular septum and cause heart block
- c) It can affect the testis and cause anterior scrotal ulcer
- d) It can affect the skull and cause saddle nose

e)It can occur in the meninges, liver and lungs.

128-Which of the following statements is true for hepar lobatum:

- a)This is liver cirrhosis caused by chronic hepatitis
- b)This is hepatic fibrosis caused by bilharzial affection of the liver.
- c)This is a hamrtomatous lesion affecting the caudate lobe of the liver
- d)This is a pattern of syphilitic affection of the liver.**
- e)This is a type of malignant liver tumors

129-Which of the following states can occur in cases of cardiovascular syphilis

- a)Heart block
- b)Aortic aneurysm
- c)Aortic incompetence
- d)Angina pectoris
- e)All of the above**

130-Which of the following statements is true about tabes dorsalis:

- a)This is tuberculous lymphadenitis of the posterior cervical lymph nodes.
- b)This is deformity of the dorsal vertebrae in cases of Pott's disease
- c) This is syphilitic affection of the spinal cord which may lead to Charcot's joint**
- d)This is a viral disease affecting the dorsal nerve roots.
- e)None of the above

131-Which of the following statements is not true about actinomycosis:

- a)It is anaerobic bacterial infection; commonest in the face and neck.
- b)It is a fungal infection of the scalp.**
- c)The bacterial colonies appear grossly as sulphur granules
- d)Actinomycotic abscesses may occur in the liver, lungs.brain or kidneys
- e)The disease microscopically resembles Mycetoma

132-Which of the following statements is true about Madura foot:

- a)This is a fungal disease affecting the foot**
- b)Spread of infection can iead to pulmonary then systemic abscesses
- c) The fungal colonies always appear white in colour
- d)The lesions develop in the soft tissue of foot without affection of bones.
- e)All of the above

133-Which of the following statements is not true about AIDS:

- a)It is caused by Epstein Barr virus**
- b)The virus mainly affects the CD4+ cell
- c)Sexual transmission is the most common route of infection
- d)It may be complicated by Kaposi's sarcoma
- e)It may be complicated by brain damage

134-Which of the following statements is not true about bilharzial cystitis:

- a)Bilharzial polyps are the most common lesions**
- b)it may be accompanied by bladder stone formation
- c)it may be complicated by pulmonary bilharziasis
- d)Hydronephrosis and renal failure may complicate the disease
- e)May be complicated by squamous cell carcinoma of the bladder

135-Which of the following statements is not true about bilharzial colitis:

- a)It may lead to pulmonary bilharziasis
- b)It predisposes to colonic cancer**
- c)It may be complicated by dysentery
- d)Liver affection is the most serious complication
- e)It may lead to the development of a peritoneal mass.

136-Which of the following statements is true about hepatic bilharziasis :

- a)The portal tracts may show dilated vascular channels**
- b)The Kupffer cells engulf bile pigment due to jaundice
- c)The hepatic framework is markedly disturbed
- d)At a late stage of the disease the liver appears markedly enlarged
- e)All of the above

137-Which of the following states is not a complication of hepatic bilharziasis: a)Ascites

- b)Splenomegaly
- c)Hepatic carcinoma**
- d)Piles
- e)Portal vein thrombosis

138-Which of the following statements is not true about bilharzial splenomegaly:

- a)It may enlarge up to few kilograms
- b)Its substance may show fibrosiderotic nodules
- c)The liver in these cases is always enlarged**
- d)The platelet count may be low
- e)The spleen may become adherent to adjacent structures

II) Put v or x in front of each statement and explain shortly the reason

- 1-Malignant brain tumors donot spread by lymphatics (**T**)
- 2-Multiple myeloma can lead to systemic amyloidosis (**T**)
- 3-Dry gangrene is more serious than moist gangrene (**F**)
- 4-Implantation cyst can develop at the site of wound healing (**T**)
- 5-The intervertebral discs may be destroyed by metastases (**F**)
- 6-Granulomas formed of epithelioid cells and giant cells are diagnostic of tuberculosis (**F**)
- 7-Aortic aneurysms can cause pressure atrophy of the vertebrae & intervertebral discs (**F**)
- 8-Benign tumors may have dangerous effects (**T**)
- 9-Hamartomas are capsulated benign tumors that usually arise at the age of puberty (**F**)
- 10-Irradiation of malignant melanoma is the treatment of choice (**F**)
- 11- Pulmonary bilharziasis may be complicated by pulmonary artery aneurysm (**T**)
- 12-Thrombocytopenia may occur in cases of bilharzial splenomegaly (**T**)
- 13-Endotoxic shock may be associated with disseminated intravascular coagulation (**T**)
- 14-Endothelial injury i s an important cause of thrombosis (**T**)
- 15-Use of oral contraceptives may enhance thrombosis (**T**)
- 16-Malignant placental type tumor (choriocarcinoma) may arise in the testis (**T**)
- 17-Intestinal gangrene is a dry type of gangrene (**F**)
- 18-Tuberculous meningitis may lead to hydrocephalus (**T**)
- 19-Liver amyloidosis is very commonly associated with hepatic failure (**F**)
- 20-Hemochromatosis is associated with bronzed skin colouration (**T**)
- 21-Hepatic steatosis may be caused by chronic alcohol intake (**T**)
- 22-Prolonged pulmonary congestion leads to left sided heart failure (**F**)

23-Tuberculoma is a malignant tumor of brain complicating tuberous sclerosis (F)

24-Albinism is dark melanin pigmentation of the skin in Addison's disease (F)

25-Teratoma can affect the sacrum (T)

26-Heart failure cells are seen in the myocardium of ischemic heart (F)

27-Neutrophils are most commonly seen in chronic inflammation (F)

28-Fibrin is a protein formed by fibroblasts during the process of fibrosis (F)

29-Amyloid is a fatty substance deposited in walls of blood vessels (F)

30-Dystrophic calcification affects healthy tissues (F)

31-Hydropic degeneration is characterized by cell dehydration (F)

32-Leiomyosarcoma is a malignant tumor of striated muscle (F)

Put ✓ or X and Give Reasons: Key answers

- 1) ✓ No lymphatics
- 2) ✓ Due to secretion of AL
- 3) X Slower putrefaction, milder toxemia
- 4) ✓ from epithelial cells trapped in the dermis during healing
- 5) X avascular
- 6) X several other types e.g sarcoidosis & tuberculoid leprosy
- 7) X not intervertebral discs which are avascular
- 8) ✓ e.g brain tumors, endocrine tumors (... mention)
- 9) X noncapsulated tumor-like malformations
- 10) X radioresistant
- 11) ✓ due to pulmonary hypertension.....
- 12) ✓ due to hypersplenism
- 13) ✓ due to activation of the clotting system
- 14) ✓ due to release of thrombotic factors & exposure of collagen to which platelets can stick 📌
- 15) ✓ due to hypercoagulability of blood
- 16) ✓ this represents a monodermal teratoma
- 17) X It is a moist type of gangrene .The intestine is rich in tissue fluids (poor evaporation)
- 18) ✓ due to fibrous obstruction to CSF flow and damage of arachnoid villi (reduced CSF absorption)
- 19) X high hepatic reserve
- 20) ✓ due to deposition of hemosiderin & melanin
- 21) ✓ alcohol leads to steatosis by several mechanisms (mention)
- 22) X leads to right sided heart failure due to pulmonary hypertension
- 23) X Tuberculoma is a tuberculous lesion composed of caseation necrosis surrounded by gliosis
- 24) X Albinism is generalized deficiency of melanin due to deficiency of tyrosinase enzyme
- 25) ✓ Teratomas can affect the sacrum .This is one of the known sites of teratoma
- 26) X Heart failure cells are macrophages engulfing hemosiderin seen in congested lungs
- 27) X Neutrophils are most commonly seen in acute inflammation
- 28) X Fibrin is a protein derived from the plasma protein fibrinogen)
- 29) X Amyloid is a fibril protein deposited in walls of small blood vessels
- 30) X Dystrophic calcification affects dead tissues due to change of pH of dead tissue
- 31) X Hydropic degeneration is characterized by cell swelling by excess water
- 32) X Leiomyosarcoma is a malignant tumor of smooth muscle

75. 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 the formation of which of the following two chemical mediators?
- a- Complement C3b and IgG
 - b- Interleukin-1 and tumour necrosis factor.
 - c- Histamine and serotonin
 - ☒ d- Prostaglandin and bradykinin
 - e- Leukotriene and HPETE
76. A 40-year-old woman had bilateral silicone breast implants placed two years ago. Since that time, she has noted increased firmness with slight deformity of the breast on the left. The implants are removed, and there is evidence for leakage of the implant contents on the left. 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- Neutrophils
 - e- Plasma cell
77. A 40-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
78. A clinical study of patients with pharyngeal infections is performed. 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 inflammation
 - ☒ b- Acute inflammation
 - c- Abscess formation
 - d- Resolution of inflammation
 - e- Chronic inflammation

79. 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 3cm 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 immunoglobulin
 - d- Mast cell histamine release
 - ☒ e- Macrophage elaboration of growth factors
80. A 5-year-old child had erythematous skin of the fingers with small blisters after he has touched a pot of boiling water over the stove. Which of the following best describes the process?
- a- Fibrinous inflammation
 - ☒ b- Serous inflammation
 - c- Suppurative inflammation
 - d- Granulomatous inflammation
 - e- Ulceration.
81. An 80-year-old woman was diagnosed as having staphylococcal pneumonia and received a course of antibiotic. Two weeks later, she no longer had productive cough but she is still feverish. A chest X-ray revealed a rounded 3cm. mass in the lower lobe of the right lung that has a central air-fluid level, and no surrounding infiltrates. Which of the following terms best describes the sequel of the patient's pneumonia?
- a- Complete resolution
 - b- Fibrosis
 - ☒ c- Abscess formation
 - d- Progression to chronic inflammation
82. A 10-year-old male patient complaining of fever, dyspnea, chest pain and rusty sputum. Radiologically, he has consolidation of the lower lobe of the lung lesion. The most likely cause of this disease is:
- a- Suppurative inflammation
 - b- Serous inflammation
 - ☒ c- Fibrinous inflammation
 - d- Allergic inflammation
 - e- Haemorrhagic inflammation

83. A 23-year-old healthy infertile man. On physical examination both testes are normal in size, however, the spermatic cord on the left side has the feel of a "bag of worms". Laboratory studies show oligospermia. Which of the following conditions in this man most likely to have?
- a- Hydrocele
 - b- Testicular torsion
 - c- Spermatocele
 - ☒ d- Varicocele
 - e- Seminoma
84. A 35-year-old female patient complains of severe pain in the right hypochondrium. CT scan reveals a large mass measuring 10x8cm in greater diameter. Microscopically, there are large communicating vascular spaces lined by large cells with large vesicular nuclei and prominent nucleoli. The diagnosis is likely to be:
- a- Cavernous haemangioma
 - b- Hepatocellular carcinoma
 - ☒ c- Angiosarcoma
 - d- Metastatic carcinoma
 - e- Cholangiocarcinoma
85. A 40-year-old woman had mid epigastric abdominal pain for the past 3 months. An upper gastrointestinal endoscopy showed a 2cm. sharply demarcated shallow ulceration of the gastric antrum. A biopsy specimen of the ulcer base revealed angiogenesis, fibrosis, mononuclear inflammatory cell infiltrate with lymphocytes, macrophages, and plasma cells. Which of the following terms best describes this pathologic process?
- a- Acute inflammation
 - b- Fibrinous inflammation
 - ☒ c- Chronic inflammation
 - d- Granulomatous inflammation
 - e- Serous inflammation
86. One month after appendicectomy, an 18-year-old young man palpates a small nodule beneath the skin at the site of the healed incision. Microscopic examination of the removed nodule revealed macrophages, collagen, few small lymphocytes, multinucleated giant cells and refractile material. Which of the following complication of the surgery is the cause of the nodule?
- a- Chronic inflammation
 - b- Ulceration
 - c- Abscess formation
 - d- Fistula formation
 - ☒ e- Suture Granuloma

87. An 28 -year-old woman receiving corticosteroid therapy for an autoimmune disease developed an abscess. She undergoes minor surgery to incise and drain the abscess, but the wound heals poorly over the next month. Which of the following aspects of wound healing is most likely to be deficient in this patient?
- a- Re-epithelization
 - b- Fibroblast growth factor elaboration
 - ☒ c- Collagen deposition
 - d- Neutrophilic infiltration
88. A 55 -year-old man had left ventricular wall infarction. Twenty four hours later he develops breathlessness(dyspnea). The most likely microscopic changes to be present in the lung are:
- a- Congestion of alveolar capillaries and numerous neutrophils, pus cells and fibrin in alveoli.
 - ☒ b- Congestion of alveolar capillaries, thickened alveolar walls by oedema, and transudate in alveoli.
 - c- Fibrosis of alveolar walls with haemosiderin-laden macrophages in alveoli
 - d- The alveolar walls are necrotic and the alveolar spaces are filled with blood.
89. A young diver descended in deep sea. After 30 minutes he ascended rapidly because he forgot to get his camera. He soon experienced difficulty in breathing, severe headache, pain in muscles & joints. These symptoms are due to:
- a- Fat emboli in arterioles
 - b- Disseminated intravascular coagulopathy
 - c- Venous thrombosis
 - ☒ d- Tissue nitrogen emboli
90. An old woman fell and stroke her back of her head. Over the next 24 hours she becomes increasing sleepy. A head CT scan shows an accumulation of a fluid beneath the dura, compressing the left cerebral hemisphere. Which of the following terms describes this collection of fluid?
- ☒ a- Haematoma
 - b- Purpura
 - c- Petechia
 - d- Ecchymosis

91. A 76-year-old woman, stays two weeks in the hospital following traumatic fracture of her left femoral trochanter. Now, she has swollen left leg, particularly below the knee. She experiences pain on movement of this leg, and there is tenderness to palpation. Which of the following complications is most likely to occur next after these events?
- a- Gangrenous necrosis of the foot
 - b- Hematoma of the thigh
 - c- Disseminated intravascular coagulation
 - ☒ d- Pulmonary thromboembolism
 - e- Soft tissue sarcoma
92. A 40-year-old woman has had a chronic cough with fever and weight loss for the past month. A chest radiograph reveals multiple nodules form 1 to 4cm. 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 of her lung lesions?
- ☒ a- Macrophage
 - b- Fibroblast
 - c- Neutrophils
 - d- Mast cell
 - e- Platelet
93. A 20-year-old man has experienced painful urination for 4 days following spring break. A urethritis is suspected, and *Neisseria gonorrhea* is cultured. Numerous neutrophils are present in a smear of the exudate from the penile urethra. Release of which of the following chemical mediators is most likely to drive neutrophils exudation?
- a- Histamine
 - b- Prostaglandin
 - c- Hageman factor
 - d- Bradykinin
 - ☒ e- Complement C5a
94. A 35-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, radiographs of her knees reveals continuing joint destruction with loss of articular cartilage and joint space narrowing. This pain reduction is most likely to be the result of diminishing which of the following chemical mediators?
- a- Leukotriene B₄
 - b- Interleukin-1
 - ☒ c- Prostaglandin
 - d- Bradykinin

95. 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
96. 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 1.5cm. 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
97. 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- Decrease serum complement
 - ☒ d- Increases serum creatine kinase
98. A 43-year-old woman has had nausea with vomiting persisting for the past 5 weeks. On physical examination there are no abnormal findings. She undergoes an upper GI endoscopy and gastric biopsies shows mucosal infiltration by lymphocytes, macrophages, and plasma cells. Which of the following most likely caused her findings?
- a- Staphylococcus aureus septicemia
 - b- Ingestion of chili peppers
 - c- Diabetes mellitus
 - d- Tuberculosis
 - ☒ e- Infection with Helicobacter pylori

99. 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 500ml. 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
100. 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 12cm. long midline abdominal incision was made. You advise this patient of the outcome of this healing process, and indicate that 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- Two months
 - d- Six months
 - b- One year.
101. A 20-year-old woman sustains an injury to her right calf. On physical examination she has a 5cm 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- Secondary wound infection
 - b- Poor tissue perfusion
 - c- Presence of sutures
 - ☒ d- Corticosteroid therapy
 - e- Hypoalbuminemia
102. A 24-year-old primigravida is late in the second trimester of pregnancy. She experiences the sudden onset of some cramping lower abdominal pain. This is immediately followed by passage of some fluid per vagina along with a foul-smelling discharge. The fetus is stillborn two days later. Examination of the placenta demonstrates extensive neutrophilic infiltrates in the chorion and amnion. Which of the following organisms is most likely to be responsible for these findings?
- a- *Mycobacterium tuberculosis*
 - b- Herpes simplex virus
 - c- *Escherichia coli*
 - d- *Treponema pallidum*
 - ☒ e- *Toxoplasma gondii*

103. 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, 3x2cm, 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- Hypertrophic scar (keloid) formation
 - b- Development of a fibrosarcoma
 - c- Poor wound healing from diabetes mellitus
 - d- Foreign body response from suturing
 - e- Staphylococcal wound infection
104. A 45-year-old man has had fever and dry cough for 3 days, and 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
 - e- Granulomatous inflammation
105. A 56-year-old man has had increasing difficulty breathing for the past week. On physical examination he is afebrile. Auscultation of his chest reveals diminished breath sounds and dullness to percussion bilaterally. There is 2+ pitting edema present to the level of his thighs. A chest radiograph reveals bilateral pleural effusions. Which of the following laboratory test findings is the most likely to have?
- ☒ a- Hypoalbuminemia
 - b- Glucosuria
 - c- Neutrophilia
 - d- Anemia
 - e- Hypernatremia
106. An 48-year-old woman has a malignant lymphoma involving lymph nodes in the para-aortic region. She is treated with a chemotherapeutic agent which results in the loss of individual neoplastic cells through fragmentation of individual cell nuclei and cytoplasm. By which of the following mechanisms has her neoplasm primarily responded to therapy?
- a- Coagulative necrosis
 - b- Mitochondrial poisoning
 - c- Phagocytosis
 - d- Acute inflammation
 - ☒ e- Apoptosis

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- ☒ e- Apoptosis

107. A 62-year-old man has complained of pain on urination, with a slightly erythematous lesion 1cm. diameter on the bladder mucosa. Microscopic examination shows cells with marked hyperchromatism and increased nuclear/cytoplasmic ratio involving the full thickness of the epithelium, with intact basement membrane. Which of the following terms best describes these biopsy findings?
- a- Metaplasia
 - b- Minimal dysplasia
 - c- Microinvasion
 - d- Hyperplasia
 - ☒ e- Carcinoma in situ
108. A 65-year-old man developed myocardial infarction in the posterior wall of the left ventricle. Which of the following pathologic findings would most likely be seen in the left ventricle 1 month later?
- a- Abscess
 - b- Complete resolution
 - c- Coagulative necrosis
 - d- Nodular regeneration
 - ☒ e- Fibrous scar
109. An experiment infects one group of test animals with viral hepatitis. Two months late, complete recovery of the liver architecture is observed when the livers are examined microscopically. A second test group is infected with bacterial organisms and after the same period of time, fibrous scars from resolving abscesses are seen microscopically in the liver. Which of the following factors best explains the different outcomes for the 2 test groups?
- a- Nature of the etiologic agent
 - b- Extent of liver cell injury
 - ☒ c- Injury to the connective tissue framework
 - d- Location of the lesion
 - e- Extent of damage of bile ducts
110. Which of the following terms best describes: a nodular raised scar that developed at the suture site over 2 months?
- a- Organization
 - b- Resolution
 - ☒ c- Keloid formation
 - d- Secondary union

111. A 60-year-old male presented to the clinic with ascites. Tapping of ascites was performed. The biochemical analysis of the aspirated fluid revealed protein content less than 1gm., specific gravity less than 1012 and few cells. The nature of this fluid is:
- ☒ a- Transudate
 - b- Exudate
 - c- Inflammatory in nature
 - e- None of the above
112. A 55-year-old male having a history of viral C hepatitis and liver cirrhosis. He started to develop oedema of the lower limbs. The pathogenesis of this oedema is:
- a- Stagnant oedema
 - b- Lymphatic obstruction
 - ☒ c- Hypoproteinaemia
 - d- Localized venous congestion
 - e- Portal hypertension
113. A young man living in sheep raising farm develops gradual onset of headache for one year. X-ray reveals calcified cystic lesion. The most propable diagnosis is:
- a- Cystic degeneration in malignant tumour
 - b- Abscess
 - c- Toxoplasmosis
 - ☒ d- Hydatid cyst
114. A 38-year-old female had traffic car accident with resulting fracture of the femur. A metal nail is introduced and fixation of the fracture is performed. Few days later she suddenly develops dyspnea, tachycardia and irritability. She may have:
- ☒ a- Fat embolism
 - b- Congestive heart failure
 - c- Air emboli
 - d- Pneumonia
 - e- Chronic osteomyelitis
115. A 30-year-old farmer develops swollen foot with multiple skin sinuses discharging yellowish granules and have areas of bone destruction. The propable diagnosis is:
- ☒ a- Madura foot
 - b- Actinomycosis
 - c- Dry gangrene
 - d- Wet gangrene
 - e- Carbuncle

116. Old diabetic patient, after trimming of the big toe nail, he developed swollen left foot, with dark blue ulcerated skin and offensive odour. The diagnosis is:
- a- Dry gangrene
 - b- Actinomycosis
 - ☒ c- Wet gangrene
 - d- Madura foot
 - e- Cellulites
117. A 70-year-old female with long history of paraplegia and immobilization in bed. She started to have skin ulcers (bed sores) at the gluteal region. These are examples of:-
- ☒ a- Wet gangrene
 - b- Dry gangrene
 - c- Infarction
 - d- Spasmodic vascular occlusion
118. A 50-year-old male with history of urinary bilharziasis. He has severe attack of haematuria. Cystoscopic examination of the urinary bladder is performed and mucosal biopsy was obtained. The pathology report recorded a precancerous lesion. This lesion is:
- a- Cystitis cystica
 - b- Brunn's nests
 - c- Urothelial atrophy
 - ☒ d- Cystitis glandularis
 - e- Bilharzial Granulomatous reaction
119. A 50-year-old male with history of urinary bilharziasis. He has an attack of hematuria after which cystoscopic examination was done. A fungating bladder mass was seen and a biopsy was taken from this mass. All the following is suspected in the pathology report EXCEPT:
- a- Transitional cell carcinoma
 - b- Squamous cell carcinoma
 - c- Adenocarcinoma
 - d- Severe dysplasia
 - ☒ e- Basal cell carcinoma
120. A 65-year-old male has a long history of medicated left side heart failure and atherosclerosis. Suddenly, he develops hemoptysis, chest pain and friction rub. He is suspected to have:
- a- Chronic venous congestion of the lung
 - ☒ b- Lung infarction on top of CVC of the lung
 - c- Lung infarction in otherwise normal lung
 - d- Lobar pneumonia

121. A 30-year-old female has history of amoebic colitis and dysentery. Few months later, she suffered Rt. hypochondral pain. X-ray reveals cystic lesion of the liver, with fluid level. The pathogenesis of this lesion is suspected to be:
- ☒ a- Parasitic emboli
 - b- Infected thrombotic emboli
 - c- Coagulative necrosis
 - d- Cystic changes in malignant tumour
122. A 55-year-old previously healthy woman is hospitalized for pneumonia. On the 10th hospital day she is found to have swelling and tenderness of her right leg, which apparently has developed over the past 48 hours. Raising the leg elicits pain. An ultrasound examination reveals findings suggestive of femoral vein thrombosis. Which of the following conditions is most likely to have contributed the most to the appearance of these findings?
- a- Trousseau syndrome
 - b- Vitamin C deficiency
 - ☒ c- Prolonged immobilization
 - d- Hypertension
123. A 50-year-old female presents with upper abdominal pain, radiating to the back. Investigations revealed pancreatic carcinoma. Later she developed recurrent attacks of multiple venous thrombosis at changing sites. This is explained by:
- a- Multiple vascular tumour emboli
 - ☒ b- Production of coagulant factors by tumour cells.
 - c- Compression of the vessels by tumour mass
 - d- Prolonged recumbancy in bed
- N.B.: What is the name of this syndrome?
124. A 40-year-old male has history of piles. He developed attack of fever and severe pain at the site of piles. A week later, he develops Rt. hypochondrial tenderness. Laparoscopic examination reveals pin-head-size nodules on the surface of the liver surrounded by zone of congestion. These lesions are the result of:
- ☒ a- Portal thrombotic emboli
 - b- Atherosclerotic emboli
 - c- Disseminated military tuberculosis
 - d- Multiple small infarction.

125. A morbidly obese 51-year-old woman dies from complications of heart disease. At autopsy, her heart weighs 600gm (normal up to 300gm) with all the chambers enlarged. Microscopically, there is increased fibrous connective tissue seen in the interstitium between myocardial fibers. The fibers are increased in size. Beneath the epicardium, adipocytes are seen interdigitating with the myocardial fibers. Which of the following terms best describes the presence of the adipocytes in her myocardium?
- a- Steatosis
 - ☒ b- Lipid degeneration
 - c- Fatty infiltration
 - d- Cholesterosis
 - e- Xanthomatosis
126. A 44-year-old woman has had episodes of right upper quadrant pain during the past 2 weeks. Her stools have become pale in color over the past 3 days. Laboratory studies show a serum total bilirubin of 9.7 mg/dl. A cholangiogram shows that a gallstone has passed into the common bile duct, resulting in obstruction of the biliary tract. Which of the following cellular alterations is most likely to be visualized on her skin surfaces?
- a- Hemosiderosis
 - b- Calcification
 - c- Lipofuscin deposition
 - ☒ d- Icterus
 - e- Steatosis
127. A 21-year-old woman has a routine Pap smear performed for a health screening examination. The pathology report indicates that some cells are found cytologically to have larger, more irregular nuclei. A follow-up cervical biopsy microscopically demonstrates disordered maturation of the squamous epithelium, with hyperchromatic and pleomorphic nuclei extending nearly the full thickness of the epithelial surface. Which of the following descriptive terms is best applied to these Pap smear and biopsy findings?
- ☒ a- Carcinoma in-situ
 - b- Metaplasia
 - c- Anaplasia
 - d- Hyperplasia
 - e- Aplasia

128. A 38-year-old man has a health screening examination. He has a routine chest x-ray that shows a 2cm. nodule in the right lower lobe. The nodule has focal calcifications. A wedge resection of the nodule is done. On microscopic examination the nodule shows caseous necrosis and calcification. Which of the following processes explains the appearance of the calcium deposition?
- ☒ a- Dystrophic calcification
 - b- Apoptosis
 - c- Hypercalcemia
 - d- Metastatic calcification
 - e- Excessive ingestion of calcium.
129. A 42-year-old previously healthy woman notes that over the past week her eyes have developed a yellowish appearance. She has had mild nausea and vomiting over the past week. On physical examination she has clera icterus. She has no other major physical examination findings except for mild right upper quadrant tenderness. Which of the following underlying conditions is most likely to contribute to development of her icterus?
- a- Hypercholesterolemia
 - b- Thrombocytopenia
 - c- Metastatic carcinoma
 - ☒ d- Viral hepatitis
 - e- Diabetes mellitus
130. A 56-year-old woman has smoked 2 packs of cigarettes per day for the past 35 years. She has had a chronic cough for the past 8 years, but recently has noted increased sputum production. On physical examination, she has a few crackles auscultated best over the lung bases. Bronchoscopy with biopsy is performed. The biopsy reveals bronchial epithelium with squamous metaplasia. Which of the following statements represents the best interpretation of these findings?
- a- This is a physiologic process of aging
 - ☒ b- This process is reversible if she stops smoking
 - c- She has metastases to lung from a primary somewhere else.
 - d- She has an increased risk for pulmonary infection
 - e- A pulmonary thromboembolus caused pulmonary infarction
131. An old woman underwent mastectomy and axillary lymph node clearance for a left breast carcinoma. Postoperatively she developed marked swelling of her left arm, which was not tender, not painful and not red. The possible diagnosis is:
- a- Inflammation of subcutaneous tissue
 - b- Phlebothrombosis of arm veins
 - ☒ c- Lymphedema
 - d- Congestive heart failure

132. A 23-year-old pregnant woman (with uncomplicated pregnancy) develops sudden dyspnea (difficulty in breathing) with cyanosis and hypotension just after her vaginal delivery. Which of the following findings is most likely to be present in the peripheral pulmonary arteries?
- ☒ a- Amniotic fluid emboli
 - b- Fat emboli
 - c- Gas emboli
 - d- Thromboemboli
133. A 45-year-old dentist works in a clinic notices at the end of the day that her legs and feet were swollen, although there was no swelling at the beginning of the day. There was no pain or redness. The liver & renal function tests were normal. Which of the following mechanisms that best explains this case?
- ☒ a- Inflammation of subcutaneous tissue
 - ☒ b- Increased hydrostatic pressure
 - c- Lymphatic obstruction
 - d- Hypoproteinemia
134. A 78-year-old man had fracture neck femur. He was hospitalized and undergone hip replacement. Two weeks later his legs were swollen, painful on movement and tender. Which of the following complications is most likely to occur after these events?
- a- Gangrenous necrosis of the foot
 - ☒ b- Pulmonary thromboembolism
 - c- Haematoma of the thigh
 - d- Fat embolism
135. A young female had multiple fractures due to a car accident. The fractures were stabilized surgically. After 1 day she suddenly complained of dyspnea (difficulty in breathing). Which of the following complication is the most likely cause of this?
- a- Congestive heart failure
 - b- Pulmonary oedema
 - ☒ c- Fat embolism
 - d- Pulmonary embolism
136. A 25-year-old man who had multiple sexual partners complained of a non tender ulcer on the penis that has been present for 1 week. On physical examination, the ulcer was round and had sharp outline, with firm erythematous indurated base and clean floor. Laboratory investigations revealed spirochetes consistent with *Treponema pallidum*. Which of the following is most likely to be seen on microscopic examination of the biopsy specimen?
- a- Granulomatous inflammation with suppuration
 - b- Granulomatous inflammation with caseation
 - c- Acute inflammation with abscess formation
 - ☒ d- Perivascular inflammation with plasma cells
 - e- Gummatous inflammation

137. About 10 months after returning from a tropical country, a 45-year-old man experiences malaise, fatigue, low grade fever, abdominal discomfort. On physical examination, he had hepatosplenomegaly and generalized lymphadenopathy with hyperpigmentation of the skin of the extremities. Laboratory investigations revealed pancytopenia. Stool analysis was negative for occult blood. Which of the following is the most likely diagnosis?
- a- Echinococcosis
 - ☒ b- Leishmaniasis
 - c- Schistosomiasis
 - d- Tuberculosis
138. A 60-year-old woman had a fever and a cough productive of yellow sputum. Chest x-ray revealed areas of consolidation in the lower lobe of the left lung. The condition was complicated by abscess formation with bronchopleural fistula. Biopsy shows small yellow sulphur granules. Which of the following organisms is the most likely to produce these findings?
- ☒ a- Actinomyces Israeli
 - b- Mycobacterium tuberculosis
 - c- Klebsiella rhinoscleromatis
 - d- Leishmania donovani
139. A 40-year-old man complained of progressive enlargement of his leg for the last 6 years that had an elephantoid appearance. On examination he had enlarged inguinal lymph nodes with scrotal oedema. Which of the following organism is most likely to present?
- a- Leishmania tropica
 - b- Echinococcus granulosus
 - c- Enterobius vermicularis
 - ☒ d- Wucheraria bancrofti
140. A 39-year-old man had maculopapular and nodular skin lesions mainly involving his face, elbows, and wrist. The nodular lesions have slowly enlarged over 10 years and are now beginning to cause deformity. These lesions are not painful, but the patient has decreased sensations in these areas. Which of the following is the most likely diagnosis?
- a- Leishmaniasis
 - ☒ b- Leprosy
 - c- Syphilis
 - d- Actinomycosis

141. A 56-year-old man has had a chronic cough for the past year. He is a non-smoker. He had an episode of hemoptysis 3 days ago. No abnormal findings are noted on physical examination. A chest x-ray demonstrates a 6cm perihilar mass. A sputum sample is collected, and the sputum cytology reveals "atypical cells present suggestive of squamous cell carcinoma". Which of the following environmental exposures is most likely to be associated with these findings?
- a- Asbestos
 - b- Radon
 - c- Silica
 - ☒ d- Polycyclic hydrocarbons
142. A 60-year-old man who has a 90 pack year history of cigarette smoking has had a chronic cough for the past 10 years. He has begun to lose weight (3kg) during the past year. No abnormal findings are noted on physical examination. He has a chest radiograph that reveals a right hilar mass. A sputum cytology shows atypical, hyperchromatic squamous cells. What is the most common initial pathway for metastases from this lesion?
- a- Blood stream
 - b- Pleural cavity
 - c- Contiguous spread to chest wall
 - ☒ d- Lymphatics
 - e- Bronchi
143. A 41-year-old woman has noted a foul-smelling vaginal discharge for 3 weeks. On physical examination there is an exophytic 3cm mass involving the ectocervix. Pap smear testing is performed. Cytologic features are consistent with squamous cell carcinoma. Which of the following is the most likely risk factor for her cervical carcinoma?
- ☒ a- Human papillomavirus infection
 - b- Diabetes mellitus, type II
 - c- Heavy cigarette smoking
 - d- Pelvic inflammatory disease
 - e- Previous cancer chemotherapy
144. A 60-year-old man with an 80 pack year history of smoking experiences an episode of hemoptysis. Physical examination reveals puffiness of the face, some pedal edema, bruises of the skin, and a blood pressure of 165/100 mm Hg. A chest radiograph reveals a 5cm right upper lobe lung mass. A fine needle aspirate of this mass yields cells consistent with small cell anaplastic ("oat cell") carcinoma. A bone scan shows no metastases. Immunohistochemical staining of the tumour cells is likely to be positive for which of the following hormones?
- a- Parathormone related peptide
 - b- Erythropoietin
 - ☒ c- ACTH
 - d- Insulin
 - e- Gastrin

145. A 50-year-old woman notes a lump in her left breast. She goes to her physician's assistant, who palpates a 2cm firm mass in her left breast. A fine needle aspiration biopsy is performed, and on microscopic examination a ductal carcinoma is seen. A poorer prognosis for the patient is most closely associated with which of the following findings?

- ☒ a- Aneuploidy by flow cytometry
- b- Positive Immunohistochemical staining for estrogen receptors
- c- Well-differentiated histologic appearance
- d- Intraductal growth pattern
- e- Stage of T1 N0 M0

146. An epidemiologic study is performed to determine risk factors for development of malignant neoplasms. A statistical analysis of pre-existing medical conditions is done. Some pre-existing conditions are observed to precede development of malignant neoplasms, while others do not. Which of the following conditions is most likely to be statistically unrelated to subsequent malignancy?

- a- Endometrial atypical hyperplasia
- b- Chronic alcoholism with hepatic cirrhosis
- c- Cervical squamous dysplasia
- d- Chronic ulcerative colitis
- ☒ e- Uterine leiomyomas

147. A 45-year-old healthy woman has a routine check of her health status. She has no chest pain, cough, or fever. A chest x-ray is taken and shows a peripheral 2.5cm diameter "coin lesion" in the right mid-lung field. Which of the following biologic characteristics best distinguishes this lesion as a neoplasm, rather than a granuloma?

- a- Recurrence following excision
- b- Rapid increase in size
- c- Sensitivity to radiation or chemotherapy
- ☒ d- Uncontrolled (autonomous) growth
- e- Necrosis

148. A 44-year-old woman who has had multiple sexual partners for the past 30 years has an abnormal Pap smear with cytologic changes suggesting human papillomavirus (HPV) infection. Without treatment, she is most likely to develop which of the following lesions?

- ☒ a- Squamous cell carcinoma
- b- Non-Hodgkin's lymphoma
- c- Kaposi's sarcoma
- d- Adenocarcinoma
- e- Leiomyoma

149. A 32-year-old woman had noted dull pelvic pain for the last two months. An abdominal ultrasound reveals an 8cm mass involving the right ovary. The mass is surgically excised. On gross inspection, the surface of the mass is smooth, is not adherent to surrounding pelvic structure, cystic and filled with greasy sebaceous material and hair. Which of the following neoplasms is she most likely to have?
- a- Choristoma
 - b- Hamartoma
 - ☒ c- Myxoma
 - d- Teratoma
 - e- Mesothelioma
150. A 53-year-old woman feels a lump in her right breast. Her physician palpates an irregular 3cm mass that is not movable because it appears fixed to the overlying skin, which is retracted. A mastectomy is performed and reveals a 3x3.5cm ovoid mass that appears to infiltrate into the surrounding fibrofatty breast stroma. The mass is firm white, and has a fibrous consistency. Which of the following features is closely related to the gross appearance of this mass?
- a- Anaplasia
 - b- Aplasia
 - ☒ c- Desmoplasia
 - d- Dysplasia
 - e- Metaplasia
151. An epidemiologic study is performed involving patients of Asian ancestry with long standing Epstein-Barr virus (EBV) infection. It is observed that these patients have an increased risk for development of malignant neoplasms in adulthood. Which of the following neoplasms is most likely to be found in these patients?
- a- Kaposi sarcoma
 - b- Small cell anaplastic carcinoma of lung
 - c- Osteosarcoma
 - ☒ d- Nasopharyngeal carcinoma
 - e- Endometrial carcinoma
152. A previously healthy 42-year-old man has a skin nodule on his right hand that has become larger and darker with more irregular outlines over the past 3 months. No other skin lesions are noted. Three nontender enlarged lymph nodes are palpable in the right axilla. The lesion is excised and microscopic examination shows a neoplasm composed of darkly pigmented polygonal and spindle cells. Which of the following risk factors is most important for development of this neoplasm?
- a- Cigarette smoking
 - b- Allergy to latex gloves
 - c- Inheritance of a faulty RB gene
 - d- Prior job-related handling of asbestos
 - ☒ e- Chronic exposure to ultraviolet radiation

153. A 27-year-old woman in excellent health has a routine health maintenance examination. A 2cm firm, rounded mass is palpable beneath the skin of the left forearm. She has no difficulty using the arm and there is no associated pain with the mass, either in movement or on palpation. The overlying skin appears normal. The mass does not change in size over the next year. Which of the following neoplasms is she most likely to have?
- a- Metastatic carcinoma
 - b- Melanoma
 - c- Rhabdomyosarcoma
 - ☒ d- Lipoma
 - e- Leiomyoma
154. A 35-year-old woman had a firm nodule palpable on the dome of the uterus six years ago recorded on routine physical examination. The nodule has slowly increased in size and now appears to be about twice the size it was when first discovered. By ultrasound scan it is solid and circumscribed. She remains asymptomatic. Which of the following neoplasms is she most likely to have?
- a- Adenocarcinoma
 - b- Leiomyosarcoma
 - c- Hematoma
 - ☒ d- Leiomyoma
 - e- Metastasis
155. A 15-year-old boy has had lumps in his right neck for the past 5 months. On physical examination there is painless lymphadenopathy in the right cervical region. One of the lymph nodes is biopsied and on microscopic examination shows many lymphocytes that are large, with clumped chromatin and occasional mitoses. The characterization of this population of lymphocytes as a neoplasm is best accomplished by which of the following methods?
- a- Immunohistochemical staining identifying leukocyte common antigen
 - ☒ b- Gene rearrangement studies that demonstrate clonality
 - c- Flow cytometry indicating a high S-phase
 - d- A differential white blood count showing a lymphocytosis
 - e- Light microscopy demonstrating fibrosis
156. A 55-year-old man dies after a year-long illness. At autopsy, his liver contains multiple tumour masses from 2 to 5cm in size that are firm and tan and that grossly exhibit umbilication with central necrosis. The surrounding hepatic parenchyma appears normal. Which of the following characteristics of neoplasia is best illustrated by these findings?
- a- Multicentric origin
 - b- High tumour grade
 - c- Primary neoplasm in the stomach
 - d- Exposure to a carcinogen
 - ☒ e- Advanced stage

157. A 60-year-old woman has a firm mass with irregular borders felt in her left breast on a routine physical examination. A fine needle aspiration is performed and microscopic examination shows malignant cells. A left mastectomy with axillary lymph node dissection is performed. A tissue sample of this neoplasm is submitted for analysis by flow cytometry. Which of the following does flow cytometric analysis most likely provide?
- a- Analysis of the karyotype
 - b- Detection of gene mutation
 - ☒ c- Determination of aneuploidy
 - d- Distinguishing carcinoma from sarcoma
 - e- Quantitation of RNA content.
158. A clinical study is performed on oncogenesis in human neoplasms. It is observed that some neoplasms appear to develop from viral oncogenesis, with serologic confirmation of past viral infection. Which of the following neoplasms is most likely to arise in this manner?
- a- Retinoblastoma
 - b- Small cell anaplastic carcinoma of lung
 - ☒ c- T-cell leukemia
 - d- Prostatic adenocarcinoma
 - e- Hepatic angiosarcoma
159. A 29-year-old European woman with a history of multiple sexual partners over the last 15 years has a routine physical examination with no abnormal findings. On pelvic examination, the cervix shows no abnormalities, but a Pap smear is taken and dysplastic cells are reported to be present. A cervical biopsy is performed and shows a low grade squamous intraepithelial lesion (LSIL), also known as cervical intraepithelial Neoplasia (CIN). Which of the following is the most therapy for this lesion?
- a- No further treatment is indicated
 - b- Antibiotic therapy
 - c- Chemotherapy
 - ☒ d- Surgical excision
 - e- Radiation
160. A 14-years-old healthy girl has a 0.3cm reddish, slightly raised nodule on the skin of the upper part of her chest found on a routine physical examination. She states that this lesion has been present for years and has not appreciably changed in size or color. Which of the following neoplasms is this nodule most likely to be?
- ☒ a- Hemangioma
 - b- Melanoma
 - c- Carcinoma
 - d- Lymphoma
 - e- Glioma

161. A 50-year-old man has felt vague abdominal discomfort for the past 4 months. On physical examination, he has no lymphadenopathy, and no abdominal masses or organomegaly can be palpated. Bowel sounds are present. An abdominal CT scan shows a well circumscribed 20cm retroperitoneal soft tissue mass obscuring the left psoas muscle. A stool specimen tested for occult blood is negative. Which of the following neoplasms is this man most likely to have?
- a- Melanoma
 - b- Hamartoma
 - c- Adenocarcinoma
 - d- Lymphoma
 - ☒ e- Liposarcoma
162. A study is performed to analyze characteristics of malignant neoplasms in biopsy specimens. The biopsies were performed on patients who had palpable mass lesions on digital rectal examination. Of the following microscopic findings, which is most likely to indicate that the neoplasm is malignant?
- a- Pleomorphism
 - b- Atypia
 - ☒ c- Invasion
 - d- Increased nuclear /cytoplasmic ratio
 - e- Necrosis
163. Review of a series of surgical pathology reports indicates that a certain type of neoplasm is diagnosed as grade 1 on a scale of I to IV. Clinically, some of the patients with this neoplasm are found to have stage 1 disease. Which of the following is the best interpretation of a neoplasm with these designations?
- a- Unlikely to be malignant
 - b- Arising from epithelium
 - c- May spread via lymphatics and blood stream
 - d- Has an in situ component
 - ☒ e- Well-differentiated and localized.
164. A 45-year-old man has smoked 2 packs of cigarettes per day for the past 30 years. He has had a chronic cough for the past 3 years, worsening over the past 2 weeks. A suspicious left pulmonary parenchymal lesion is seen on a chest x-ray. He has a bronchoscope performed. A biopsy of a segmental bronchus shows squamous metaplasia. Which of the following is the most appropriate interpretation of this finding?
- a- Ischemic tissue damage
 - ☒ b- Irritant effect
 - c- Early stage of cancer
 - d- Viral infection
 - e- Congenital anomaly

165. A 45-year-old woman has had congestive heart failure for the past 4 years. She develops a fever that persists for over a week. On physical examination, a heart murmur is present. Her temperature is 38.4 C.; the spleen tip is palpable. On echocardiography, she has an abnormally thickened mitral valve. Laboratory studies show a blood culture positive for *streptococcus viridians* group. Another echocardiogram reveals a 1 cm vegetation on the superior aspect of her mitral valve. Which of the following findings would you most expect to appear in the kidney as a consequence of these events?
- a- Marked passive congestion
 - ☒ b- Ischemic infarct
 - c- Extensive edema
 - d- Granulomatous inflammation
 - e- Gangrenous necrosis
166. A 73-year-old man suffers a "stroke" On physical examination he cannot move his right arm. A cerebral angiogram demonstrates occlusion of the left middle cerebral artery. An echocardiogram reveals a thrombus within a dilated left atrium. Which of the following is the most likely pathologic alteration from this event that has occurred in his brain?
- ☒ a- Cerebral softening from liquefactive necrosis
 - b- Pale infarction with coagulative necrosis
 - c- Predominantly the loss of glial cells
 - d- Recovery of damaged neurons if the vascular supply is reestablished
 - e- Wet gangrene with secondary bacterial infection
167. A 30-year-old woman is claiming a fight with one of her neighbours. A workup by her physician reveals a 2 cm left breast mass. There is no lymphadenopathy. No skin lesions are seen, other than a bruise to her upper arm. An excisional biopsy of the breast mass is performed. On microscopic examination, the biopsy shows fat necrosis. This biopsy result is most consistent with which of the following etiologies?
- a- Physiologic atrophy
 - ☒ b- Breast trauma
 - c- Lactation
 - d- Radiation injury
 - e- Hypoxic injury
168. A 48-year-old man has an episode of severe substernal chest pain radiating to his left arm. Four months later he has increasing dyspnea and orthopnea. On physical examination, there are rales heard over all lung fields. An echocardiogram shows a left ventricular aneurysm. Which of the following findings is most likely to be indicative of the original acute event at the time he presented with chest pain?
- a- Troponin 1 release from myofibers
 - ☒ b- Collagenous scar tissue in the myocardium
 - c- Chronic passive congestion of the liver
 - d- Organizing mural thrombus in the left ventricle
 - e- Recanalization of a coronary artery thrombosis

169. A 73-year-old male suffers a "stroke" with loss of blood supply to the posterior left frontal lobe in the distribution of the middle cerebral artery. The most likely consequence observed in his brain of this event is:
- ☒ a- Softening from liquefactive necrosis
 - b- Pale infarction with coagulative necrosis
 - c- Predominantly the loss of glial cells
 - d- Recovery of damaged neurons if the vascular supply is reestablished
 - e- Wet gangrene with secondary bacterial infection
170. A renal biopsy from a 55 year old male who has developed progressive renal failure for the past five years shows extensive glomerular and vascular deposition of pink amorphous material on H & E staining. This material demonstrates apple-green birefringence under polarized light after Congo red staining. Which of the following conditions is most likely to be present in this man?
- a- Rheumatoid arthritis
 - b- Tuberculosis
 - c- Systemic lupus erythematosus
 - ☒ d- Multiple myeloma
 - e- Alzheimer's disease
171. A 48 yearold male has a chronic cough with fever. The chest radiograph reveals a diffuse reticulonodular pattern. Microscopically on transbronchial biopsy there are focal areas of inflammation containing epithelioid macrophages, Langhans giant cells, and lymphocytes. This is most typical for which of the following immunologic responses:
- a- Type I hypersensitivity
 - b- Type II hypersensitivity
 - c- Graft versus host disease
 - d- Polyclonal B-cell activation
 - ☒ e- Type IV hypersensitivity
172. A 60-year-old female has had fevers for months and a chest radiograph shows a diffuse reticulonodular pattern along with enlarged hilar lymph nodes. A lymph node biopsy shows non-caseating granulomata with fibrosis, but a Ziehl-Neelsen stain shows no acid-fast bacilli. The most probable diagnosis is:
- a- Silicosis
 - b- Scleroderma
 - c- Mycobacterium avium-intracellulare infection
 - d- Byssinosis
 - ☒ e- Sarcoidosis.

173. A young male had 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. The scar is firm, but not tender, with no erythema. The mass is excised and microscopically is found to be composed of fibroblasts with abundant collagen. By which of the following mechanisms has this series of events most likely occurred:
- ☒ a- Hypertrophic scar (keloid) formation
 - b- Development of a fibrosarcoma
 - c- Poor wound healing from diabetes mellitus
 - d- Foreign body response from suturing
 - e- Staphylococcal wound infection
174. A 45-year-old female has an enlarged lymph node that on biopsy reveals a metastatic neoplasm. Which of the following is the most likely primary neoplasm?
- a- Cerebral glioma
 - ☒ b- Adenocarcinoma of the colon
 - c- Fibroadenoma of the breast
 - d- Liposarcoma of the retroperitoneum
 - e- Laryngeal papilloma
175. A mass lesion in the right upper lobe of lung found by chest radiograph is removed by wedge resection and sent to Surgical Pathology, where a neoplasm is diagnosed. Findings that will be important for determining further therapy and prognosis include all of the following EXCEPT:
- a- Is the neoplasm invading the margin of resection?
 - b- What is the size of the neoplasm?
 - c- What is the degree of atypia and pleomorphism of the neoplastic cells?
 - ☒ d- How much inflammation is present in the neoplasm?
 - e- Is the neoplasm primary or metastatic?
176. A 49 year old male is found to have a 15 cm mass in his left thigh. This mass radiographically does not appear to arise from bone, but it does have infiltrative margins. Microscopically, the mass is composed of highly pleomorphic spindle cells. Which of the following markers is most likely to be demonstrated by immunohistochemical staining of the cells of this neoplasm?
- a- Cytokeratin
 - b- Factor VIII
 - c- Alpha fetoprotein
 - d- Lambda light chain
 - ☒ e- Vimentin

177. An 80 year old male is noted to have a palpable, firm mass in the region of the right neck after he complains of difficulty swallowing. A head CT scan reveals a 7 cm solid soft tissue mass to the right side of the esophagus. A biopsy of this mass demonstrates pleomorphic spindle cells that are cytokeratin negative but vimentin positive. This mass is most likely to be:

- a- Wilms tumor
- ☒ b- Rhabdomyosarcoma
- c- Neuroblastoma
- d- Ewing's sarcoma
- e- Malignant lymphoma

ANSWERS OF PROBLEM CASES

IN GENERAL PATHOLOGY

1. a- Coagulative necrosis.
2. a- Fat necrosis
b- Mistaken for malignancy
c- Acute haemorrhagic pancreatitis.
d- Enzymatic fat necrosis due to action of pancreatic lipase on neutral fat in fat cells.
3. a- Fatty change
b- Sudan III on F.S.
4. a- Renal amyloidosis (nephrotic syndrome).
5. a- Renal stones due to hypercalcaemia
b- Serum Ca level
c- Sites of metastatic calcification.
6. a- Amyloidosis.
7. a- Fatty change.
8. a- Sarcoidosis.
9. a- Definition of squamous metaplasia in the book.
10. a- Features of dysplasia and grading in your book.
11. a- Hyperplasia
12. a- Columnar metaplasia (Barrett's esophagus)
13. a- Lipofuscin pigment
d- Lipochromes
14. a- Fat embolism
15. a- Macrophages (see your book)
16. a- Capillary haemangioma.
17. a- Malignant melanoma.
18. see your book
19. a- Liposarcoma
20. a- Cushing's syndrome (Paraneoplastic syndrome)
21. a- Basal cell carcinoma.
22. a- Benign cystic teratoma of the ovary
23. a- Fat; Fatty change
24. a- Epidermal growth factor (EGF)

25. a- Heart failure cells, macrophage
26. a- Post mortem clot.
27. a- 60% Nocardia (Actinomyces) 40% Madurella (Fungus)
28. a- Tertiary syphilis affecting CNS and aorta.
29. a- Chronic fibrocaceous T.B. of the lung.
30. a- Malignant melanoma.
31. a- Pott's disease.
32. a- Rhinoscleroma.
33. a- Sarcoidosis
34. a- Pulmonary embolism with infarction (Phlebothrombosis).
35. a- Mature cystic teratoma.
36. a- Rheumatic fever
37. a- Diphtheria.
38. a- see your book b-Squamous metaplasia
39. a- 3
40. a- Haemosiderin.
41. a-1 b- Carbon d- Metastasis
42. a- Septicaemia
43. a- Pyaemic abscesses b-A.B.E. d- Portal Pyaemia.
44. a- Siliosis with superimposed T.B.
45. a- Pulmonary hamartoma
46. a- Pancost's tumor c & d the same as bronchogenic carcinoma
47. a- SCLC (release of ACTH from tumor, causing Cushing's S.)
48. a- Fat embolism.
49. a- lung b- hemorrhagic infarction.
50. a- Healing by second intention.
51. a-Keloid.
52. Apoptosis.
53. a- phlebothrombosis with pulmonary embolism.
54. 2^{ry} pulmonary T.B.; Assmann's focus.
55. Chronic fibrocaceouscavitary T.B.
56. Chronic fibrocaceouscavitary T.B.
57. Mycobacterium Tuberculosis.

83. d	116. c
84. c	117. a
85. c	118. d
86. e	119. e
87. c	120. b
88. b	121. a
89. d	122. c
90. a	123. b (Trousseau's)
91. d	124. a
92. a	125. c
93. e	126. d
94. c	127. a
95. a	128. a
96. e	129. d
97. d	130. b
98. e	131. c
99. c	132. a
100. c	133. b
101. d	134. b
102. e	135. c
103. a	136. d
104. b	137. b
105. a	138. a
106. e	139. d
107. e	140. b
108. e	141. d
109. c	142. d
110. c	143. a
111. a	144. c
112. c	145. a
113. d	146. e
114. a	147. d
115. a	148. a

149. d
150. c
151. d
152. e
153. d
154. d
155. b
156. e
157. c
158. c
159. d
160. a
161. e
162. c
163. e

164. b
165. b
166. a
167. b
168. b
169. a
170. d
171. e
172. e
173. a
174. b
175. d
176. e
177. b