

TOP 100 OPTOMETRYBOARDS.COM PATHOLOGY SECRETS

1. **Cell volume** depends on function of cell membrane = semipermeable with proper amount of **ATP**
2. **Cell injury** increased $[Ca^{2+}]$ in the hyaloplasm (cytosol)
3. **Cell death** Nuclear changes
 1. **Pyknosis**: chromatin clumping and shrinking with increased basophilia
 2. **Karyolysis**: fading of chromatin material
 3. **Karyorrhexis**: fragmentation of chromatin
4. **Necrosis** (death of cells/tissues) is most often caused by ischemia or the action of toxic substances and infectious pathogens
5. **Apoptosis** (programmed cell death) can also be caused by exogenous factors (i.e., viruses, drugs)
6. **Hyperplasia**: increase in cell # increase in tissue/organ size; **Hypertrophy**: increase in cell size
7. **Inflammation** involves the following responses...
 1. Vascular
 2. Cellular
 3. Humoral
8. **Mediators of inflammation** are produced by *endothelial cells & inflammatory cells*, and the **liver** (*main source of plasma proteins*)
9. **Hageman factor (clotting factor XII)** activates the following systems...
 1. Kinin
 2. Complement
 3. Clotting
 4. Fibrinolytic system
10. **Cytokines**: are multifunctional polypeptides that modulate the function of other cells
11. **Polymorphonuclear leukocytes**: principal cells of **ACUTE INFLAMMATION**
 1. **Lymphocytes, macrophages, & plasma cells** are principal cell of **CHRONIC INFLAMMATION**
12. **Edema**: accumulation of fluid in the interstitial spaces and body cavities
13. **Thrombosis**: pathologic coagulation of circulating blood inside intact vascular spaces
14. **Virchow Triad**: 3 factors that promote thrombosis
 1. Changes in the vessel wall
 2. Changes in bloodflow
 3. Changes in the composition of blood
15. Most common form of embolism = **thromboembolism**
16. **Disseminated Intravascular Coagulation (DIC)**: a form of thrombosis and small blood vessels associated with uncontrollable bleeding caused by consumption of coagulation factors in the blood
17. **Infarct**: an area of *ischemic necrosis* that is usually caused by occlusion of vessels or hypoperfusion of tissues (w/ blood)
18. **Shock**: a condition caused by hypoperfusion of tissues (w/ blood); can be classified as...
 1. **Cardiogenic**
 2. **Hypovolemic**
 3. Distributive (related to vasodilation)
 4. **Septic**
 5. Neurogenic

19. **Hypersensitivity reactions:** involve cell and tissue injury caused by antibodies or products of activated T lymphocytes
20. **Autoimmune diseases:** are based on the immune reaction against self-antigens
21. **Acquired immunodeficiency syndrome (AIDS):** an infectious disease caused by the **human immunodeficiency virus (HIV)**
 1. Characterized by profound suppression of the immune system and susceptibility to infections, neurologic disorders, and malignancies
22. **Cancer = malignant tumors**
23. **Main groups of malignant tumors** are:
 1. Carcinomas
 2. Sarcomas
 3. Lymphomas
 4. Gliomas
24. **Carcinogens:** are cancer-inducing factors that include physical forces, chemicals, viruses, and endogenous oncogenes
25. **Reactions of the host to the tumor** can be *LOCAL* or *SYSTEMIC*, and include various inflammatory, and immune, hormonal, circulatory, and neural processes
26. **Teratogens:** are chemical, physical, or biological agents capable of inducing developmental abnormalities and a fetus
27. **Down syndrome:** the most common autosomal chromosome abnormality
 1. Characterized by *mental deficiency* and characteristic facial and somatic features
28. **Laws of Mendelian Genetics:** states that single gene defects are inherited as...
 1. Autosomal dominant,
 2. Autosomal recessive,
 3. Sex-linked dominant, or
 4. Sex-linked recessive
29. **Atherosclerosis:** a multi-factorial disease that predominately affects older people, but it can be accelerated by...
 1. Hypertension
 2. Hyperlipidemia
 3. Smoking
30. **Arterial hypertension:** any mobile factorial disease of unknown etiology, but it can also be secondary to renal, endocrine, vascular, and neurologic diseases
31. **Vasculitis:** an inflammation of vessels, is most often immunologically mediated
32. **Aneurysms:** localized dilations of the arteries *most often caused by atherosclerosis and hypertension*
33. **Cardiac failure** may be caused by...
 1. Inherited heart disease
 2. Extracardiac causes
 1. **Pressure overload** (in hypertension)
 2. **Volume overload** (in renal water retention)
34. **Coronary heart disease:**
 1. Most common *cause of cardiac failure*
 2. Most common *cause of death in the U.S.*
35. **Myocardial Infarction (MI):** “heart attack” - represents an area of myocardial cell necrosis caused by ischemia
36. Most common *complication of an MI = Arrhythmia*
37. Most common *cause of Endocarditis = bacteria*

38. **Cardiomyopathy:** (3 forms)
 1. Dilated
 2. Hypertrophic
 3. Restrictive
39. **Ventricular Septal Defect (VSD):** most common *noncyanotic congenital heart disease*
 1. Characterized by a L R shunt
40. **Tetralogy of Fallot:** most common *cyanotic congenital heart disease*
 1. Includes 4 pathologic findings:
 1. **VSD**
 2. **Overriding dextraposed aorta**
 3. **Pulmonary artery stenosis**
 4. **Right ventricular hypertrophy**
41. **Hypochromic microcytic anemia:** is most often caused by *iron deficiency* and **chronic blood loss**
42. **Sickle cell anemia:** is a hereditary hemoglobinopathy caused by a mutation of the α -globin gene
43. **Lymphomas:** malignant tumors of lymphoid cells – are most often of **B-cell origin**
44. **Leukemia:** a malignancy of hematopoietic and lymphoid cells
 1. Characterized by the appearance of malignant cells in the circulation
45. **Multiple Myeloma:** a malignancy of plasma cells
 1. Associated w/ **lytic bone lesions** and **monoclonal gammopathy**
46. **Hodgkin Disease (HD):** a form of lymph node malignancy
 1. Characterized by the presence of **REED-STERNBERG CELLS**
 2. Several histologic forms of Hodgkin Lymphoma (HL):
 1. Lymphocyte-predominance
 2. Lymphocyte-rich
 3. Mixed cellularity
 4. Lymphocyte depletion (has the worst prognosis of the forms of HLs)
 5. Nodular sclerosis (most common form of HL)
47. **Atelectasis:** is incomplete expansion of the lungs or collapse of a previously inflated lung parenchyma (“**collapsed lung**”)
 1. **Collapsed lungs:** (4 categories of atelectasis)
 1. **Resorption** – a blockage preventing new air from getting in
 2. **Compressive** – a **potential space** in the pleural cavity gets filled and causes compression on the lung (fluid, blood, air)
 1. **Pneumothorax**
 3. **Contraction** – the lungs contract generally, not readily curable, a lung that is becoming fibrotic
 4. **Microatelectasis** – the inability of the lungs to fully expand
 1. Alveolar level
 2. Usually caused by surfactants
 3. Surfactants – keeps the wet thin membranes from sticking to each other
48. **Adult Respiratory Distress Syndrome (ARDS):** is caused by **Diffuse Alveolar Damage (DAD)** resulting from injury of endothelial cells or pneumocytes forming the alveolar—capillary units
49. **Chronic Obstructive Pulmonary Disease (COPD):** includes several diseases, but the most important are **EMPHYSEMA** and **CHRONIC BRONCHITIS**

50. **Bronchial Asthma**: a chronic relapsing inflammatory **OBSTRUCTIVE lung disease**, presenting w/ hyperreactivity of airways and periodic bronchospasm
51. **Acute pneumonia**: an inflammation of lungs usually caused by viruses or bacteria
52. **Pneumoconioses**: are interstitial lung diseases caused by inhaled particles such as coal, silica, or asbestos
53. Most **lung cancers** originate from the *epithelium of the bronchi* and are related to *smoking*
54. **Esophagitis** is most often caused by **Gastroesophageal Reflux Disease (GERD)**
55. **Atrophic Gastritis**: (the most common form of gastritis) is most often caused by ***Helicobacter pylori***
56. **Peptic ulcers** are prone to bleeding.
57. **Carcinomas** of the **esophagus** and **stomach** = **poor prognosis**.
58. **Diarrhea** can be classified as...
1. Osmotic
 2. Secretory
 3. Exudative
 4. Malabsorptive
 5. Mixed
59. **Malabsorption syndrome** is characterized by **steatorrhea** and **deficiency of fat-soluble vitamins**.

60. **Inflammatory bowel disease (Crohn disease and ulcerative colitis)** they share some features but differ in many aspects. (see table below)

FEATURES THAT DIFFER BETWEEN CROHN DISEASE AND ULCERATIVE COLITIS		
FEATURE	CROHN DISEASE	ULCERATIVE COLITIS
MACROSCOPIC:		
BOWEL REGION	ILEUM ± COLON (Terminal ileum, ileocecal valve, & cecum)	COLON ONLY
DISTRIBUTION	SKIP LESIONS (earliest lesion = <i>aphthous ulcer</i>)	DIFFUSE (<i>Pancolitis</i> = entire colon) (Left-sided disease = no further than the transverse colon) (Ulcerative proctitis/ulcerative proctosigmoiditis = limited distal disease)
STRICTURE	YES <i>"Creeping Fat"</i>	RARE
WALL APPEARANCE	THICK <i>"Cobblestone"</i> / Fissures	THIN (mucosal atrophy)
MICROSCOPIC:		
INFLAMMATION	TRANSMURAL Crypt abscesses / distortion of mucosal architecture	LIMITED TO MUCOSA (diffuse) (+ <i>Backwash ileitis</i>)
PSEUDOPOLYPS	MODERATE	MARKED (mucosal bridges = fused tips of polyps)
ULCERS	DEEP, KNIFE-LIKE	SUPERFICIAL, BROAD-BASED
LYMPHOID REACTION	MARKED	MODERATE
FIBROSIS	MARKED	MILDE TO NONE
SEROSITIS	MARKED	MILDE TO NONE
GRANULOMAS	YES (~35%) (<i>Noncaseating = Hallmark of CD*</i>)	NO
FISTULAE/SINUSES	YES	NO
CLINICAL:		

PERIANAL FISTULA	YES (IN COLONIC DISEASE)	NO
FAT/VITAMIN MALABSORPTION	YES	NO
MALIGNANT POTENTIAL	WITH COLONIC INVOLVEMENT (<i>Paneth cell metaplasia</i>)	YES
RECURRENCE AFTER SURGERY	COMMON	NO
TOXIC MEGACOLON	NO	YES

1. ***Carcinoma of the large intestine*** is the **third** most common *form of cancer* and the **third** most common *cancer-related cause of death in the U.S.*
 1. It occurs most often in the **rectosigmoid area**.
2. ***Jaundice*** can be classified as...
 1. prehepatic (hemolytic)
 2. hepatic
 3. posthepatic (obstructive).
3. ***Cirrhosis*** is equivalent to ***end-stage liver disease***
 1. characterized by...
 1. loss of normal hepatic ^[1]_{SEP} architecture
 2. fibrosis
 3. the formation of regenerating nodules
4. ***Hepatitis*** is most often caused by viruses, drugs, or immune mechanisms
5. ***Chronic alcoholism*** may cause three pathologic changes in the liver:
 1. fatty liver
 2. alcoholic hepatitis
 3. cirrhosis
6. **Alcohol** and **biliary disease** account for 80% of all causes of ***acute pancreatitis***.
7. ***Diabetes mellitus***: (a disease characterized by hyperglycemia) is caused by...
 1. Insulin deficiency (TYPE 1)
 2. Tissue resistance to insulin (TYPE 2)
8. ***Uremia*** is a set of clinical and laboratory findings found in patients with **end-stage kidney disease**
9. ***Glomerulonephritis*** is *immunologically mediated* in most instances.
10. ***Pyelonephritis*** is a *bacterial kidney infection*.
11. The **most important tumors of the kidneys and the urinary tract** are...
 1. Renal cell carcinoma
 2. Transitional cell carcinoma
 3. Wilms tumor
12. ***Testicular tumors*** are derived from germ cells in 90% of cases and belong to two groups:
 1. Seminomas (most common testicular tumor)
 2. Nonseminomatous germ cell tumors (NSGCTs)
13. ***Prostate carcinoma*** is the most common malignant tumor in males
14. **Carcinomas of the vulva, vagina, and cervix** are linked to ***human papillomavirus (HPV)*** infection

1. Most common types of HPV related to carcinomas:
 1. HPV 16
 2. HPV 18
2. Most common type of HPV that cause genital warts (condylomata acuminata)
 1. HPV 6
 2. HPV 11
 3. (and HPV 16)
15. **Endometrial adenocarcinoma** is linked to **hyperestrinism**
16. **Leiomyomas** are the most common benign tumors of the uterus
17. **Breast carcinoma** is the most common (non-skin) malignant tumor in females
18. **Hyperthyroidism** may be caused by...
 1. Autoimmune mechanisms (e.g., in Graves disease)
 2. Tumors (e.g., follicular adenomas)
 3. Hyperfunctioning goiters
19. **Hyperparathyroidism**, most often caused by **parathyroid adenoma**
 1. Characterized by **hypercalcemia**
20. **Hypofunction of adrenal glands** is the cause of **Addison disease**, whereas **hyperfunction** causes **Cushing syndrome**
21. The **three most important skin diseases caused by bacteria** are...
 1. Impetigo
 2. Folliculitis
 3. Acne
22. **Warts** are caused by **HPV** infection.
23. **Psoriasis** is a common chronic skin disease of unknown etiology affecting 1% to 2% of the population
24. **Skin cancer** is related to **sun exposure**
25. **Basal cell carcinoma** of the skin, the most common malignant tumor, is only locally invasive and ^[1]_{SEP} rarely metastasizes
26. **Pigmented skin lesions** may be *benign* (such as **freckles**, **lentigo**, and **nevus**) or *malignant* (such as **malignant melanoma**)
27. **Osteoporosis** is a form of **osteopenia** characterized by a loss of both calcium salts and organic matrix of the bones (osteoid)
28. The **two most important diseases of the joints** are **rheumatoid arthritis** and **osteoarthritis**
29. **Osteosarcoma** occurs most often in *children and young people*, whereas **chondrosarcoma** has ^[1]_{SEP} its peak incidence in *adults*
30. **Duchenne muscular dystrophy** is the most common *genetic muscle disease*
31. The **most important immunologic diseases of the muscle** are **polymyositis** and **myasthenia gravis**
32. **Rhabdomyosarcoma** is a malignant tumor of *striated muscle*
33. The **most important forms of intracranial bleeding** are...
 1. Intracerebral hemorrhage in ^[1]_{SEP} hypertension
 2. Subdural hematoma
 3. Subarachnoid hematoma
 4. Epidural hematoma
34. **Infection of the brain and the meninges** can occur through four main routes:
 1. Vascular spread
 2. Direct extension

3. Ascending neural route
4. Penetrating wounds
35. **Tabes dorsalis** is a *spinal cord lesion* caused by **syphilis**.
36. **Multiple sclerosis** is a demyelinating autoimmune disease characterized by a chronic relapsing ^[SEP]and remitting course
 1. MS is the most common **demyelinating disease**
37. **Alzheimer's disease** (an old-age neurodegenerative disease of unknown etiology) is the most common cause of **dementia**
38. Most **brain tumors** are malignant
39. **Gliomas** are malignant tumors of the **CNS** originating from...
 1. Astrocytes
 2. Oligodendroglia cells
 3. Ependymal cells.
40. **Diabetic neuropathy** is the most common peripheral nerve disease encountered in general practice