

USMLE World Notes - Important Points

- Subendothelial Deposits are seen in SLE patients
- Subepithelial Humps are seen in Acute Poststreptococcal Glomerulonephritis
- Linear Subendothelial are seen in Goodpasture's (Type II)
- Mesangial Deposits are seen in IgA Nephropathy
- Spike and Dome are seen in Membranous
- Subendothelial Humps are seen in Membranoproliferative
- Azithromycin – administered to HIV + patients can prevent Mycobacterium Avium
- Ethambutol – inhibits arabinosyl transferase which polymerizes arabinose into arabinan etc. Side Effects → Optic Neuritis
- Rifampin – inhibits bacterial DNA dependent RNA polymerase and thus prevents transcription of DNA into mRNA.
- Isoniazid – inhibits mycolic acid synthesis.
- $FF = GFR/RPF$ $GFR = \text{Creatinine Clearance/Inulin}$
- $RPF = PAH$
- Fibroadenoma – cellular myxoid stroma, sometimes there are compressed cystic spaces.
- Spongiosis - epidermal accumulation of edematous fluid in the intercellular spaces.
- Diphenoxylate – opiate anti-diarrheal structurally related to Meperidine.
- Octreotide – good for secretory diarrhea, which is a Somatostatin Analog
- Urease – converts urea to carbon dioxide and ammonia and thus increases pH
- Radiation Therapy - causes 1) DNA double strand breakage 2) formation of free radical
- Methadone – has a long half life
- In Fetal Lungs - after 30 weeks there is an increase in Lecithin
- After 36 weeks there is a rise in Phosphatidylglycerol
- Males with 5 α reductase deficiency - feminized external genitalia, small phallus and Hypospadias are common.
- Repair Damage – Glycosylase → Endonuclease → Lyase → DNA Polymerase → Ligase
- H. Pylori – most common cause of duodenal ulcers
- CMV in immunocompromised – Mononucleosis

- Retinitis in CMV – HIV+ Patients
- Primary CNS Lymphoma – most commonly associated with AIDS
- Squamous Cell Lung Cancer – produces Parathyroid Hormone Related Peptide, which in turn will decrease PTH
- Campylobacter – can be transmitted from domestic animals
- Shigella - is transmitted via fecal oral in day care centers
- Keratin - marker of epithelial cell origin.
- Secretin - produced by S endocrine cells in the duodenum, that increases bicarbonate secretion from exocrine pancreas into the small bowel.
- Alprazolam – benzodiazepine with the shortest half life, which is used in Acute Anxiety.
- Diazepam, Chlordiazepoxide and Clonazepam – longest half life, used in prophylaxis.
- Sheets of Primitive Cells with Many Mitotic Figures – Medulloblastoma
- Most Common Tumors in Children:
 - Pilocytic Astrocytoma - Rosenthal Fibers
 - Medulloblastoma - sheets of small blue cells, many mitotic figures
 - Ependyoma – can cause Hydrocephalus and form Rosettes
- Orthostatic Hypotension – side effects of α adrenergic blockers.
- AML - has associations with t(15,17), t(8,21) and Auer Rods are stained with Myeloperoxidase.
- CLL – deletion on Chromosome 13
- Mantle Cell B Lymphoma – t(11,14)
- Dobutamine – causes increase in cardiac contractility and increase in Heart Rate
- Tumors of Schwann Cells – are derived from neural Crest Cells.
- Patients with CGD – susceptible to 1) Staph Aureus 2) Pseudomonas 3) Serratia
- Nocardia 5) Aspergillus
- Rosenthal Fibers – with granular eosinophilic bodies are seen in Pilocytic Astrocytoma. They are well differentiated comprised of spindle cells with hair like glial projections
- Atropine – reverses muscarinic effects but does not prevent the development of nicotinic effects such as muscle paralysis
- Pralidoxime – reverses both muscarinic and nicotinic effects of organophosphates by “restoring” cholinesterase.
- Calcium – binds to Troponin C and then uncovers tropomyosin sites, thus allowing actin to bind to myosin.

- **S 3 Heart Sound** – can be heard if the patient lies down in Left Lateral Decubitus Position or Exhales Completely
- **RBF = Renal Plasma Flow/ (1-Hematocrit)**
- **In Metabolic Alkalosis** – measure patient's Urinary Chloride
- **Germinoma** - tumors of Pineal Gland, formed in children and adolescents.
- **Will present with 1) Precocious Puberty** due to β -HCG Production (similar in testicular seminoma) 2) Obstructive Hydrocephalus 3) Parinaud Syndrome – paralysis of upward gaze.
- **Ultraviolet Specific Endonuclease** – initiates repair by nicking the strand at Thymine Dimer. This enzyme is missing in Xeroderma Pigmentosum
- **SER** – functions in synthesis of Lipids, Carbohydrate Metabolism and Detoxification of Harmful Substances
- **Uretero Pelvic Junction** – most common site of obstruction
- **Increased Intraocular Pressure** – most common side effect of treatment of Bradycardia with Atropine.
- **Mutation in Glycoprotein** – will cause changes in the host and they mediate attachment to target host cell.
- **cAMP pathway** - α_2 , β_1 and β_2
- **Inositol Pathway** – α_1 adrenergic, muscarinic, cholinergic
- **Ion Channel** – Nicotinic, Cholinergic.
- **Ampicillin** – must be added to treat infants with Meningitis. Ceftriaxone covers all organisms, but *Listeria Monocytogenes* is killed by Ampicillin.
- **B 19 Fifth's Disease** – causes aplastic crises (bone marrow)
- **Eaton Lambers Syndrome** - associated with Lung Cancer, similar to Myasthenia Gravis. Antibodies are against pre-synaptic Calcium Channels.
- **Myotonic Dystrophy** – triplicate repeat, movement frontal baldness, cataracts are seen. Cannot Loosen Hand Grip.
- **Cholinomimetics** – indicated in Urinary Retention Paralytic Ileus and Glaucoma
- **HUS** – after E. Coli – Microangiopathic Hemolytic Anemia
- **Segmental Viruses (Rotavirus and Orthomyxovirus)** - capable of Genetic Shift.
- **Paget's Disease** - increase in Osteoclasts, then increase in Osteoblasts, which will increase Alkaline Phosphatase.
- **Arginase** - enzyme in Urea Cycle produces Urea and Ornithine from Arginine.
- **Minute Ventilation** - product of Tidal Volume and RR and includes Dead Space.

- Neurophysis – carriers for Oxytocin and ADH in Posterior Pituitary.
- Epinephrine – increases Systolic BP (α_1 Effect)
- Increase Heart Rate (β_1 Effect)
- Decreases Diastolic (β_2 Effect)
- Pretreatment with Propranolol à eliminates β Effects and Leaves α Effects Only.
- Protein C Deficiency in Warfarin Therapy – will exaggerate the response and cause Hypercoagulable State with Skin Necrosis
- Neonates with Hypothyroidism - weak, pale, dry. Macroglossia and Umbilical Hernia
- Acyclovir - incorporates into newly replicated Viral DNA
- Hemorrhagic Cystitis in Children – Adenovirus (especially in Males)
- Uric Acid precipitates - collecting ducts due to Low Urine pH.
- Insulin - drug of choice for Gestational Diabetes.
- AML - formation of PML/RAR α fusion gene, unable to signal for proper differentiation
- Auer Rods – stained with myeloperoxidase
- Donepezil – Tx for Alzheimer's Disease, is a Cholinesterase Inhibitor and also you would add Vitamin E.
- NMDA Receptor in CNS overstimulation by Glutamate – thought to increase AD Symptoms. Tx with Memantine (antagonist)
- Barbiturates – increase duration of Chloride Channel Opening
- Benzodiazepines – increase frequency of Chloride Channels.
- Serum Fibrinogen – must be monitored in DIC.
- Narcolepsy – deficiency or Low Levels of Neurotransmitter Orexin (Hypocretin)
- Hawthorne Effect - tendency of a study population to affect an outcome due to what is studied.
- Mullerian Inhibitory Factor – secreted by Sertoli Cells
- Primary infection with HSV – more spread out, but Reactivation is more Localized to 1 side.
- S-100 Positive – Schwannoma and Melanoma. Both are from Neural Crest Cells.
- T- Lymphocytes – Paracortical Zone
- B-Lymphocytes - Germinal Centers of Lymph Node
- Turner Syndrome - heavily methylated DNA due to Low Transcription Activity (Heterochromatin is not transcriptionally active, it's too condensed)

- Adenovirus – low grade fever, throat pain, pharyngoconjunctivitis, can be transmitted in Summer Camps.
- Fragile X - gene methylation, and this is inactive, because it's condensed.
- Burr Cells, Helmet Cells - Mechanical Red Cell Destruction. Pt's with Prosthetic Valves.
- When Vaccinated - Virus Entry into cells is impaired.
- Sotalol – β Blocker with Class III (Potassium Channel Blocker) Properties will cause Bradycardia and QT Prolongation.
- Pre B-ALL \rightarrow TdT + CD 10 and CD 19
- Pre T-ALL \rightarrow CD2, CD3, CD4, CD5, CD7, CD8, CD1a, TdT
- Leukocyte Alkaline Phosphatase – decreased in CML, increased or normal in Leukemoid Reaction which is 50,000 WBC.
- Homocystinuria (similar to Marfan's) – deficiency of Cystathione Synthase. Tx with Pyridoxine Supplements (B6)
- Ring Enhanced Lesions – Toxoplasmosis, Seizures
- Dihydrobiopterin Reductase – Cofactor for Both Phenylalanine Hydroxylase and Tyrosine Hydroxylase.
- Osteoblasts convert to Osteocytes – osteocytes are connected by Gap Junctions.
- Lecithinase – alpha toxin, produced by C. Perfringens and has an ability to degrade Lecithin, main component of Phospholipid Membrane
- Terminal Bronchioles – lined by ciliated simple cuboidal epithelium.
- Nipple Retraction – in Breast Cancer is usually due to infiltration of Cooper's Ligament by Cancer.
- Prepatellar Bursa – commonly seen in roofers, carpenters, people who are kneeling all the time.
- Acute Myelogenous Leukemia – is associated with t(15,17), where gene for Retinoic Acid is transferred from Ch. 17 to Ch. 15
- Sarcoidosis – presents with increased number of CD4 + T cells.
- Calcitonin – released from Parafollicular cells of Thyroid, in response to increasing levels of calcium. It promotes calcium absorption by the bone and reducing calcium absorption by the intestines and thus decreasing the levels of circulating calcium
- NSAIDS - are the primary cause of papillary necrosis and chronic interstitial nephritis
- Increased levels of Calcium, Phosphate and Oxalate – promote salt formation and thus stones
- Increased levels of Citrate and High Fluid Intake – prevent salt formation

- **Cell Mediated Immune Response** – stimulates production of Interferon Gamma, Tumor Necrosis Factor Beta and IL 12 which in turn induces cytotoxic T cell response and eliminated intracellular organism such as Listeria
- **Listeria Monocytogenes** – Gram Positive Rod which produces Very Narrow Beta Hemolysis Zone on Sheep Blood Agar and exhibits Tumbling Motility and the only Gram Positive Organism that produces LPS endotoxin (which is normally found in Gram -)
- **Succinylcholine** – depolarizing NMJ blocker and usually elicits a fast response within 60 seconds and lasts for 10 minutes.
- **Bethanechol** – muscarinic agonist that improves bladder motility in post operative patients
- **Oxybutinin** – antimuscarinic agonist that is used in patients with urinary incontinence
- **Motor Innervation of the Tongue** – provided by Hypoglossal Nerve (12), except for palatoglossus which is innervated by Vagus Nerve (10)
- **Sensation of the Tongue** – Anterior 2/3 is Mandibular Branch of Trigeminal Nerve, Posterior 1/3 is by Glossopharyngeal Nerve (9).
- **Gustatory Innervation of the Tongue** – Anterior 2/3 is Chorda Tympani by Facial Nerve, Posterior 1/3 is by Glossopharyngeal Nerve.
- **Hypercalcemia in Sarcoidosis** – is by macrophages activated Vitamin D, which is extrarenally produced, it will in turn suppress PTH.
- **1st Pharyngeal Pouch** – external auditory meatus, primary tympanic cavity and auditory tube
- **2nd Pharyngeal Pouch** – Palatine Tonsils
- **3rd Pharyngeal Pouch** – Thymus, Inferior Parathyroid Gland
- **4th Pharyngeal Pouch** – Superior Parathyroid Gland.
- **Phenytoin** – causes increased expression of Platelet Derived Growth Factor (PDGF), they stimulate growth of gingival cells.
- **Propranolol** – used in Thyrotoxicosis and will decrease the heart rate and Decreases Peripheral Conversion of T4 to T3
- **MEN 1** – Parathyroid Tumor (Hypercalcemia), Pancreatic Tumor (Gastrin), Pituitary Adenoma (Prolactin, ACTH)
- **MEN 2a** – Medullary Carcinoma of the Thyroid (Calcitonin), Pheochromocytoma and Parathyroid Tumor
- **MEN 2b** – Medullary Carcinoma of Thyroid, Pheochromocytoma, Marfanoid Features/Mucosal Neuromas
- **Myocardial Infarction** – is the most common cause of Death in Diabetic Patients.
- **Carbamazepine** – blocks Voltage Gated Na Channels in Cortical Neurons, and is used in Trigeminal Neuralgia. Causes Bone Marrow Suppression and increase in ADH will cause SIADH.

- Ethosuximide – blocks T-type Calcium Channels and decreases Calcium current in Thalamic Neurons, used for Absence Seizures.
- Type 2 Diabetes – Amyloid Deposition in the Pancreatic Beta Cells.
- Type 1 Diabetes – beta cells are destroyed by T Lymphocytes, look for Infection
- Von Hippel Lindau - autosomal dominant disorder characterized by cerebellar hemangioblastomas, clear cell carcinomas and pheochromocytomas. All patients have a deletion of VHL gene on Chromosome 3b.
- Acyclovir – can cause crystalline nephropathy if hydration is not provided.
- In CO poisoning – PO₂ is normal, % Saturation of Oxygen is decreased, because CO competes with O for Heme Sites, Oxygen Content is decreased.
- In Anemia - PO₂ is normal, % Saturation of Oxygen is Normal, Oxygen Content is decreased
- In Polycythemia – PO₂ is normal, % Saturation of Oxygen is Normal, Oxygen content in the blood is Increased.
- Foscarnet – is a pyrophosphate analog and can chelate Calcium, it will also cause Magnesium excretion and thus the side effects are Hypocalcemia and Hypomagnesemia and thus there will be Seizures in patients taking Foscarnet.
- In Restrictive Lung Diseases – high expiratory flow rates occur despite Low Lung Volumes, and that is due to Increased Elastic Recoil Pressure and Increased Radial Traction on the airways.
- Henoch Schonlein Purpura – leukocytoclastic vasculitis due to deposition of IgA immune complexes and presents with low extremity purpura, abdominal pain, arthralgia and renal involvement.
- Lymphogranuloma Venerium – is caused by Chlamydia Trachomatis, and will present with painful vesicular lesions.
- Acute Salicylate Overdose – at first there is a Respiratory Alkalosis, because salicylates stimulate medullar respiratory center and cause hyperventilation. Metabolic Acidosis occurs due to accumulation of acids, and thus it's a mixture of Respiratory Alkalosis (low PCO₂) and Metabolic Acidosis (low plasma HCO₃)
- Prevention of Reinfection with Influenza – anti-hemagglutinin IgG antibodies in the blood and anti-IgA antibodies in the mucus and nasopharynx.
- Estrogen – will increase TBG levels, by reducing its destruction and thus will increase T4 levels. So expect patients on Hormone Therapy to have increased T4 levels.
- Acanthosis Nigricans – Benign Form is associated with Insulin Dependent Diabetes and Malignant Form is usually due to underlying GI Adenocarcinoma.
- Nucleoside Analogs – Acyclovir, Gancyclovir, Valacyclovir are nucleotide analogs that need to be converted into a Monophosphate Form by Herpes Viral Kinases – Thymidine Kinases.
- Cidofovir – is already a Nucleoside Monophosphate and thus doesn't need to be converted to monophosphate and only needs to be converted into an active Triphosphate Form.

- **Neuraminidase Inhibitors** – prevent Virion Release from infected cells with Hemophilis Influenza.
- **Amantadine** – inhibits uncoating and disassembly of Influenza A Toxin after it has entered the cell.
- **Ribosomal RNA** – is synthesized in Nucleolus. It's the proteins that are synthesized in RER.
- **+ Trandelenburg Test** – checks for damage to Superior Gluteal Nerve that innervates Gluteus Medius and Minimus.
- **Newborn born to Diabetic Mothers** – will present with Hypoglycemia and most of the times they present with Macrosomia, Transposition of Great Vessels, Renal Agenesis, Rectal Atresia. Hypoglycemia is due to Beta Cell Hyperplasia, and not because Insulin has crossed the Placenta, because it doesn't. Thus when glucose crosses placenta into fetal blood, the response of the fetus will be Beta Cell Hyperplasia.
- **In Cyanide poisoning** – Amyl Nitrite is the antidote, because Nitrites increase formation of Methemoglobin, and Methemoglobin has an increased affinity for Cyanide. Sodium Thiosulfate also is used in Cyanide Poisoning which will form Thyocyanite which is less toxic.
- **Recall Bias** – when patients are selected who suffered an adverse effect and they are more likely to recall previous risk factors.
- **Selection Bias** – is when patients are selected by providers based on their severity of the disease. For Example: severely ill patients are more likely to enroll in cancer trials.
- **P. Aeruginosa** – non-lactose fermenting (gram –) Rod and is the cause of UTI in patients with Indwelling Urinary Catheters as well as patients on Respirators.
- **Injections into gluteal region** – must be targeted into Superior Gluteal Region, to avoid injury to sciatic or gluteal nerves.
- **Foscarnet** – is a pyrophosphate analog and does not need to be converted intracellularly to monophosphate form by viral Thymidine Kinase. Its side effects include Hypocalcemia, Hypomagnesemia and thus Seizures!!!!
- **Cushing's Syndrome** – is usually caused by exogenous administration of Glucocorticoids. Thus the Adrenal Cortex will appear shrunken and Atrophied.
- **Sand Paper Like Rash** – Actinic Keratosis, that appears as crusted lesion on Sun Exposed Areas in elderly, it may turn into Cutaneous Horns.
- **Mycobacteria** – that grows as Serpentine Cords, usually establishes Virulence!!!
- **Adrenal Crisis** – will present with shock syndromes in combination with Hyponatremia, Hyperkalemia and Hypoglycemia, and presence of nuchal rigidity, fever, rash and vomiting suggests Neisseria Meningitidis Infection caused Waterhouse Friedrichsen Syndrome, where there is an Adrenal Hemorrhage.
- **Primary Mineralocorticoid Excess** – can be due to tumor of Zona Glomerulosa, which will cause Hypokalemia, Bicarbonate Retention and Sodium Retention. Which will in turn decrease Renin.
- **Cushing Syndrome** – primary work up will include Dexamethasone Suppression Test. Where Cortisol Levels would not be suppressed due to endogenous Cushing Syndrome causing Pituitary Adenoma.

- In Anorexia – levels of fat drop below normal and this will in turn decrease pulsatile release of GnRH.
- Acid Fast Stain – stains mycolic acid and at first its placed into Carbol-fuchsin and then will be treated with Hydrochloric Acid and Alcohol
- SnRNP (snurps) – are involved in the process of removing RNA introns during Synthesis and thus are necessary for synthesis of Messenger RNA
- Competent Patients – have the right not to find out about their diagnosis, if they don't want to.
- Beta Lactamase Inhibitors – Clavulanic Acid, Sulbactam and Tazobactam will inhibit destruction of Beta Lactam Ring of Penicillins.
- Abciximab – inhibits binding of Glycoprotein IIb/IIIa to Fibrinogen.
- Glanzmann Thrombasthenia – is a deficiency of IIb/IIIa glycoprotein on platelet surfaces.
- Leukotrienes – are synthesized by eosinophils, basophils in asthmatics
- Histamine – bronchoconstrictor and is released by mast cells.
- Methacholine Challenge – cholinergic muscarinic agonist used in testing for asthma
- Valproic Acid – if taken during pregnancy, increases the risk of Neural Tube Defects.
- Test for Temporal Arteritis – first thing to look at is Erythrocyte Sedimentation Rate. If it's elevated (>100) then the positive diagnosis.
- PrP – has an α - helical structure and is usually found in Creutzfeldt Jacob Disease, where there is a Spongiform Transformation of Gray Matter. Spongiform is because the abnormal protein accumulates in Vacuoles and will form a Sponge Like surface.
- Subacute Sclerosing Encephalitis – complication of Measles Virus in children and adolescents. Usually found in type of Measles Virus that has an M-antigen missing.
- Multiple Sclerosis – will present with visual changes, painful eye movements and there will be Demyelination of Axons, but Never a Loss of Neurons, Axon Disruption or Astrocyte Degeneration.
- Herpes Encephalitis – usually a complication of HSV 1 virus in children and will involve Temporal Lobe Encephalitis.
- Meningitis caused by E.coli – usually will involve a K-1 Viral Capsule that will be infectious. E.coli will grow Pink Colonies on MacConkey Agar.
- Transfused Blood – will contain citrate, that is used to prevent clotting of the blood, but in patients who are transfused with large amounts of blood, it will cause Hypocalcemia, because it chelates Calcium.
- Fanconi Anemia – patients will present with DNA exonuclease deficiency, and will be similar mechanism to Xeroderma Pigmentosum.
- Warfarin Therapy – Gamma Carboxylate protein C and S (which are Natural Anti Coagulants), and in patients with Protein C deficiency, there will be an extreme risk of Thrombosis.

- Clopidogrel and Ticlopidine – are ADP antagonists and will act by blocking interaction of Ligands with Platelet Receptors. Patients on Ticlopidine, will have Neutropenia and Mouth Ulcers as a side effect!!!!
- Cilostazol and Dipyridamole – decrease Phosphodiesterase and thus increase cAMP.
- RANK Receptor/RANK Ligand – are essential for formation and differentiation of Osteoclasts. Hypoestrogenic state (Low Estrogen) will increase RANK and thus will cause an increase in Osteoclasts and thus in Increased Bone Resorption.
- Vacuoles formed in CJ Prion Disease – are accumulations of Alpha Helical Protein that became abnormal and these accumulations will form Spongiform Encephalitis and we will see PrP proteins in this disease.
- C-peptide – can be used as a marker for Endogenous secretion of Insulin by β -pancreatic cells. Glyburide which is a SulfonylUrea will increase the rate of Insulin Secretion and Levels of C-peptide in Type II Diabetes.
- Patients with MS after Hot Showers – will experience Extreme Fatigue after taking a Hot Shower, because the Heat will Decrease the Speed of Axonal Transport.
- M-CSF and RANK receptors – are present on Osteoclasts. Macrophage –Colony Stimulating Factor and RANK are present in Osteoclasts.
- E.Coli causing UTI – will express Fimbriae, which are Fimbrial Antigens, which are used for adhesion to Uroepithelial Cells.
- Brunner's Glands in Duodenum – which are unique to Duodenum, will secrete Alkaline Mucous into the ducts.
- Cilostazol and Dipyridamole – will decrease the activity of Platelet Phosphodiesterase and thus will increase cAMP. Also they will cause Vasodilation of Arterioles. Used in Peripheral Artery Disease – Intermittent Claudication!!!!
- Ankylosing Spondylitis – are associated with HLA B-27, which are TYPE I HLA class.
- Type II HLA Class are antigens that contain DR, DP and DQ.
- Ethosuximide – blocks T-type Calcium channels that trigger and sustain rhythmical burst discharges in thalamic neurons.
- Phenytoin – blocks Na channels and thus decreases the firing of neurons
- Valproic Acid – blocks NMDA receptors and affects K current.
- Benzodiazepines – can cause daytime drowsiness and increase the risk of Falls in Elderly.
- Meckel's Diverticulum – remnant of omphalomesenteric duct (vitelling duct) and is a true diverticulum, that consists of all the layers of the intestinal wall (mucosa, submucosa and muscularis)
- Power of a study – 1-percentage where it fails. So if the data fails 20% of the time, then .8 is a power of study.

- **Acute Rejection** - occurs within weeks of transplantation and primarily mediated by host T-lymphocytes that act against donor MHC antigens. To prevent, administer Calcineurin Inhibitor such as Cyclosporine.
- **Cricopharyngeal Muscle Dysfunction** – caused by diminished relaxation of pharyngeal muscles during swallowing. Usually occurs in elderly, where they present with coughing, choking and recurrent aspiration.
- **Doxorubicin** – anthracycline chemotherapeutic agent will form free radicals in myocardium. The side effect is cardiac fibrosis, which will present with Dilated Cardiomyopathy.
- **Phospholipase C** - forms IP3 and DAG from phospholipids. And IP3 causes an increase in intracellular calcium, which then activates Protein Kinase C.
- **Lactase Deficient Patients** - will present with a Normal Intestinal Mucosa.
- **Polycystic Ovarian Disease Patients** – will benefit from therapy with Clomiphene, which is an estrogen receptor antagonist and will increase the release of GnRH and stimulates ovulation. Because in PCOS the patients' ovaries will secrete estrogen which will feedback inhibit GnRH, and in treatment with Clomiphene, these receptors will be suppressed and thus GnRH will secrete estrogens and induce ovulation.
- **Nimodipine** – Calcium Channel Blocker, used in surgery on Subarachnoid Hemorrhage to prevent cerebral vasospasm.
- **Aspergillosis** – occurs in Old Lung Cavities. It will grow as a Fungus Ball and will present in old cavities caused by TB, Sarcoidosis or Emphysema. Patients with Asthma may have a hypersensitivity reaction to Aspergillus.
- **Erosions of Gastric Mucosa** - are called erosions because they do not penetrate Muscularis Mucosa, when they do, then it's called Ulcers.
- **Candida Albicans** – will inoculate into serum at 37 degrees for 3 hours will lead to formation of Hyphae from Yeast.
- **Mitral Valve Prolapse** – the most common cardiac abnormality that predisposes to native Valve Bacterial Endocarditis.
- **Majority of Free Water** – will be reabsorbed in the Proximal Tubule, regardless of the patient's Hydration Status.
- **Alpha 1 antitrypsin deficiency** – should be suspected in all patients with premature onset (<50 years old) of Chronic Bronchitis, Emphysema and Dyspnea. History of Neonatal Hepatitis with Cholestasis will heighten the suspicion of A1AT deficiency!!!
- **PCO2** – is the most potent Cerebral Vasodilator. Patients with COPD will usually have low PO2 and High PCO2 and thus will present with Increased Cerebral Circulation.
- **Aortic Regurgitation** – will present with Widened Pulse Pressure and the patients will have Head Bobbing.
- **Achondroplasia** – the most common defect in these patients is the mutation of Fibroblast Growth Factor Receptor (FGFR-3) at the epiphyseal growth plate and the cells that are affected are Chondrocytes.

- **Trigeminal Neuralgia** – is commonly due to V2 and V3 nerves of CNV and will be treated by Carbamazepine.
- **Acute Necrotizing Pancreatitis** – Major Risk Factor for Adult Onset Respiratory Distress Syndrome. Thus patients will have an elevated Amylase and Lipase.
- **Abetalipoproteinemia** – is an inherited inability to synthesize apolipoprotein B, which is a component of Chylomicrons. Thus Lipids will accumulate in the Intestinal Epithelium, because they can't be transported out.
- **Resting Membrane Potential** – is normally about -70 mV and is due to Potassium Efflux and Sodium Influx.
- **Valproate** – is preferred in patients with Combined Absence Seizures and Tonic Clonic, not Ethosuximide which is only for Absence Seizures.
- **Cystinuria** – is due to defect in renal tubules, which fails to absorb amino acid Cysteine. To test for this, we do Cyanide test which detects Sulfhydryl Groups and will detect presence of Cystine.
- **Poststreptococcal Glomerulonephritis** – will have granular deposits of IgG, IgM and C3 in the mesangium and basement membrane.
- **Stapedius Muscle** – innervated by Stapedius Nerve, which is a branch of CNVII. Paralysis of Stapedius Muscle will cause Hyperacusis. Ipsilateral Hyperacusis is usually seen in Bell's Palsy, which is a peripheral facial nerve palsy.
- **Hyperacute Rejection** – that occurs immediately due to Preformed Antibodies within the recipient. This is a Type II Hypersensitivity Reaction.
- **Patients with Mitral Stenosis** – might have an Opening Snap, which usually follows S2 heart sound.
- **VSD** – is usually heard at Left Midsternal Border and produces a Holosystolic Murmur.
- **Fixed Wide Splitting** – is present in patients with Atrial Septal Defect. Which is a fixed wide splitting of S2.
- **Phrenic Nerve** – which innervates diaphragm, arises from C3-C5.
- **Clubbed Fingers** – patients will usually have Bronchiectasis or other Lung Diseases.
- **Uroporphyrinogen Synthase** – is an enzyme deficient in patients with Porphyria.
- **Patients with Coronary Thrombi** – will have a high activity of Metalloproteinases in the clot and this will predispose to Myocardial Infarction.
- **Colchicine** – inhibits Leukocyte Migration and Phagocytosis by Blocking Tubulin Polymerization. The side effects are Nausea and Diarrhea, should not be used in Renal Insufficiency Patients or Elderly.
- **Children with Measles** – will benefit from therapy with Vitamin A. Deficiency of vitamin A, will include xerophthalmia, night blindness, keratomalacia and corneal perforation.
- **Strep Viridans** – will be present after Dental Surgery, and will use Dextrans as substrates to facilitate adherence of Strep Viridans to Fibrin.

- **Inhaled Anesthetics** – will vasodilate Cerebral Vasculature, but will depress the blood flow in Liver, Kidneys, Heart.
- **TCA Patients Cause of Death** – is usually due to Arrhythmia which is precipitated by Blocking of Fast Sodium Channels in patients who overdose on Tricyclic Anti Depressants, which normally inhibit reuptake of Norepinephrine and Serotonin.
- **Imipramine** – which is a TCA, will precipitate episodes of Mania in patients who are depressed.
- **Malignant Hyperthermia** – usually occurs after inhalation anesthetics were used and is treated with Dantrolene, which Ryanodine Receptors and will inhibit the release of Calcium into a cytoplasm.
- **Nafcillin or Methicillin** – resistance is due to alteration of Penicillin Binding Protein. Which will alter the Binding of Penicillin and thus cause Resistance.
- **Enteropeptidase Deficiency** – will decrease conversion of Trypsinogen to Trypsin in Intestines, which will present with diarrhea, growth retardation and hypoproteinemia.
- **Lymphedema in Post Mastectomy Patients** – will predispose to development of Lymphangiosarcoma of Lymphatic Channels, will occur 10 years after the surgery.
- **Natural Killer Cells** – are responsible for killing if MHC I cells fail to respond. NK cells are CD16 and CD56, and do not require Thymus for Maturation. They are activated by IL 12
- **Sickle Cell Patient** – with HbA of 60% and Hb S of 40% will not develop painful crises, due to a high number of Hb A, but will be protected from Plasmodium Falciparum.
- **QT Prolongation** – will result from mutation of K channel protein that contributes to delayed current of cardiac action potential.
- **Wegener Granulomatosis** – will present with Crescents on Light Microscopy.
- **Decidualization of endometrium** – is seen in pregnancy, it's just another name for a change in the endometrium with gestation
- **Perchlorate, Pretechnetate** – are used to pretreat people with Thyroid Problems, they will block iodide absorption via competitive inhibition.
- **Adenosine Deaminase** – deficient in SCID and Adenosine accumulates and is toxic to T-lymphocytes.
- **Hydroxylation of Lysine to Proline** – occurs in RER and requires Vitamin C.
- **Bone Specific Alkaline Phosphatase** – is indicative of Osteoblastic Activity
- **Tartrate Resistant Acid Phosphatase, Hydroxyproline and Deoxypyridinoline** – indicative of Osteoclastic Activity.
- **Glucocorticoid Therapy** – number 1 cause for Adrenal Insufficiency
- **Atherosclerosis** – predisposes to Abdominal Aortic Aneurysm Formation
- **Hypertension** – risk factor for development of Aortic Dissections

- **Abdominal Pain due to Pancreatitis** – is the presenting sign of patients with Hypertriglyceridemia, where there are elevated levels of Chylomicrons
- **Hepatitis B Infection** – will fill up the cytoplasm with spheres and tubules containing HbSAg, which gives it eosinophilic ground glass appearance
- **Hepatitis C Infection** – will form lymphoid accumulation in the portal tracts and cause focal areas of macrovesicular steatosis.
- **Haloperidol** – the drug associated with the side effect of Neuroleptic Malignant Syndrome, which presents with confusion and muscle rigidity.
- **Glucocorticoids** – are preferred as a short term therapy for Rheumatoid Arthritis, and Methotrexate is used for Moderate to Severe Rheumatoid Arthritis.
- **Neuronal Damage** – will present with Gliosis, due to the death of Astrocytes.
- **Calcium Channel Blockers** – will present with Bilateral Ankle Swelling and Flushing as a Side Effect.
- **α Ketoacid Dehydrogenase** – is usually deficient in Maple Syrup Disease and the treatment is to avoid Branched Chain Amino Acids, such as Isoleucine, Leucine and Valine.
- **Goodpasture's Syndrome** – presents with Linear Deposits on IF.
- **Minimal Change Disease** – presents in children with Selective Albumin Loss Proteinuria.
- **Fetal HbF** – contains Gamma Globin instead of Beta Globin.
- **Thiazolidinediones (Pioglitazone, Rosiglitazone)** – you must check for Liver Function Tests, due to increased risk of Hepatotoxicity.
- **Annular Pancreas** – present due to Abnormal Migration of Ventral Pancreatic Bud.
- **Congenital Bicuspid Aortic Valve** – presents with Calcification and will cause Aortic Stenosis later on in Life.
- **Bupropion** – doesn't have Sexual Dysfunction Side Effects and is an excellent choice opposed to SSRIs
- **Major Basic Protein** – secreted by Eosinophils functions to kill Helminths
- **Adult Pneumovax** – is an Unconjugated Polysaccharide Vaccine.
- **Primary Pulmonary Hypertension** – is usually due to idiopathic dysfunction of Pulmonary Artery Endothelium
- **ATP** – is a regulatory stimulus that acts to stimulate KATP Channels in Insulin Producing Pancreatic Beta Cells.
- **Brown Pigment Stones** – results in the release of β -glucuronidase by injured hepatocytes.
- **S. Pneumonia** – is able to undergo transformation on the agar, if combined with another bacteria
- **E.Coli** – is unable to undergo Pilus Mediated Transfer of DNA Conjugation.

- **Strep. Viridans** – produce Dextrans from Glucose to colonize.
- **Congenital Toxoplasmosis** – presents with Hydrocephalus, Intracranial Calcifications and Chorioretinitis.
- **Coccidiomycosis** – produces Spherules in the Lung Tissue.
- **Systemic Mastocytosis** – abnormal proliferation of mast cells and increased histamine secretion. Gastric Hypersecretion will be seen in Mastocytosis, due to increased production of Gastric Acid by Parietal Cells.
- **Treatment with Statins** – will increase LDL Receptor Density.
- **Neural Tube Defects** – will present with increased Alpha Fetoprotein and Increased Acetylcholinesterase
- **Minimal Alveolar Concentration MAC** – best measure of potency of an inhaled anesthetic.
- **MHC Class I Molecule** – consists of a Heavy Chain and a Beta 2 Microglobulin
- **Lactase Deficiency** – will present with Increased Stool Osmotic Gap, Increased Breath Hydrogen and Decreased Stool pH.
- **Pathogenesis of Crohn's Disease** – presents with activity of TH1 cells, which will increase production of IL-2 and Interferon Gamma and thus increase production of Macrophages and thus Granuloma Formation.
- **Leuprolide** – GnRH Agonist, will at first cause a Transient Increase and then Decrease in Testosterone and DHT.
- **Factor V Leiden Mutation** – causes Factor Va resistance to Inactivation by Activated Protein C, patients will present with Atypical Thromboses.
- **Legionnaire's Disease** – caused by Legionella Pneumonia causes disease in smokers, with diarrhea, headache and confusion
- **DDAVP (Desmopressin)** – increases vWF release from the endothelial cells.
- **S 4** – causes an extra sound before S 1 and that is due to a stiff ventricle
- **Second Generation (Atypical) Anti Psychotics** - Clozapine, Risperidone, Olanzapine and Quetiapine are used for positive and negative symptoms.
- **Echinococcus** – usually causes cysts in the liver, that if are ruptured, may cause Anaphylaxis.
- **Cyanotic Spells** – where a patient will strain himself to vasoconstrict and thus reverse RàL shunt, are seen in Tetralogy of Fallot.
- **Diastolic Failure** – will cause an increase only in EDVP, where a Systolic will increase both ES and EDVP.
- **Benign Glomus Tumor** – glomangioma, can produce a tender cyanotic nodule under the nail, and the cells that caused this are involved in Thermoregulation.

- Morphine – opioid agonist, that works on Potassium Channel Conductance.
- Negative Predictive Value – the probability of being free of disease, if the result is negative.
- Small Cell Carcinoma – shows evidence of neuroendocrine origin.
- Potassium Iodide – is added to decrease the uptake of thyroid by the thyroid gland in Hyperthyroid Patients.
- PTU – propylthiouracil, blocks the enzyme Thyroid Peroxidase, and thus decreases the formation of Thyroid Hormone.
- Ventricular Hypertrophy – as well as volume overload can induce formation of ANP and BNP from ventricular myocytes and induce diuresis and natriuresis.
- Selegeline – an inhibitor of MAO Type B receptors, in patients treated for Parkinson it can protect from damaging of dopaminergic neurons. Treatment with Selegeline and Amantadine is a First Step in management of Parkinson Patients, after all the options are tried, only then we administer Carbidopa/Levodopa.
- COX 2 Inhibitors – do not affect platelet function, because it's mostly under COX 1 control.
- Maple Syrup Urine Disease – defect in α -ketoacid dehydrogenase, which requires 5 cofactors (Thiamine Pyrophosphate, FAD, NAD and Coenzyme Q) similar to Pyruvate Dehydrogenase.
- Rupture of Myocardium – is the most common complication of AMI 3-7 days later. Hypotension, Increased Jugular Vein Distention and Muffled Heart Sounds are the signs.
- Dietary Energy – 9 kCal per gram of Fat, 4 kCal per gram of Carbs and Protein and 7 kCal per gram of Ethanol.
- Cardiac Output – Oxygen Consumption / Arteriovenous O₂ difference.
- Hepatitis A Virus – can be inactivated by boiling for 1 minute at 85 degrees, treating with Formaldehyde and Bleach.
- QT Prolongation – is usually caused by Potassium Channel Blockers, Amiodarone is a Potassium Channel Blocker that doesn't predispose to Torsades de Pointes.
- Areas of Metaplasia – may be present in the duodenal ulcers created by H. Pylori Infection.
- Complications of CF – in US, usually are CardioRespiratory Symptoms, such as Pneumonia, Bronchiectasis, Cor Pulmonale and Obstructive Pulmonary Disease.
- Standard Deviation – 68% is in the range of 1 SD, 95% are in the range of 2 SD and 99.7 % contain 3 SD's
- Increased Osteoid Matrix – is a complication of Rickets
- Macrophages loaded with PAS Positive granules – are usually seen in Whipple Disease, if there are signs of Malabsorption in middle aged individuals.
- Lipofuscin – is an accumulation of Lipid Peroxidation accumulating in aging cells.

- Elevated Serum Alpha Fetoprotein – is usually present in Hepatocellular Carcinoma (Hepatoma)
- Complication of CREST – earliest damage is seen in small vessels, where it causes intimal thickening
- Damage to Posterior Hypophysis – will cause Diabetes Insipidus only for a short period of time.
- Damage to Hypothalamic Nuclei – will cause a long term Diabetes Insipidus, not the transient that is seen with damage to Posterior Hypophysis
- Tolcapone – is a COMT Inhibitor, which serves to prolong the availability of Levodopa in Parkinson Patients. Check for Liver Enzymes when administering
- Elastin's ability to recoil when stretched – is due to Lysyl Hydroxylase crosslinking
- Mitral Valve Prolapse – is the most common predisposition to Valve Bacterial Endocarditis.
- Cerebellar Tumor in a Child – is most likely a Medulloblastoma or Pilocytic Astrocytoma, medulloblastomas are always solid and Astrocytoma are solid and cystic.
- Renal Cell Carcinomas – are usually associated with Von Hippel Lindau and deletion of VHL gene on Chromosome 3p.
- Patients with splenic rupture – are usually susceptible to bacterial infections, such as S. Pneumonia, H.Influenzae and N. Meningitidis.
- Ergonovine – is an ergot alkaloid that constricts vascular smooth muscle by stimulating alpha adrenergic and serotonergic receptors and thus it can cause a Coronary Vasospasm.
- N-Acetylcysteine – works by cleaving Disulfide Bonds within Mucus Glycoproteins and thus Loosening the Mucus.
- Vitamin E Deficiency – the most notable changes are seen in Nervous System, where there is a degeneration of Spinocerebellar Tracts, dorsal columns and peripheral nerves, which is similar to Friedrich's Ataxia.
- Pulmonary Effect of Vagus Stimulation – is bronchoconstriction, which will increase the work of breathing, mucus production and airway resistance.
- V. Cholera – does not survive well in Acidic pH. So any condition that causes achlorhydria will cause V. Cholera to proliferate.
- During Recovery from ATN – patients tend to develop Hypokalemia, due to high volume, hypotonic urine.
- Mutation in CFTR gene – in CF patients will cause an abnormal folding of a protein and will result in degradation of a protein before it reaches the cell surface.
- Cavernous Hemangioma – is the most common benign tumor of the liver, which on microscopy presents with blood filled vascular spaces
- Avitaminosis of Vitamin A – may cause a squamous epithelial metaplasia of Pancreatic exocrine ducts, seen in patients with CF

- **Coccidioides Immites** – presents with spherules on microscopy and it looks like berries.
- **Aspiration Pneumonia** – is usually seen in alcoholics, seizures, old age, poor oral hygiene, the agents usually aspirated are *Fusobacterium*, *Bacteroides*
- **Thiopental** – is an anesthetic and will cause a paralysis, further on it will dissolve into the Skeletal Muscle Tissue.
- **Tetralogy of Fallot, Transposition of Great Vessels and Truncus Arteriosus** – can be caused by an abnormal migration of Neural Crest Cells.
- **Inhalation Anesthetics** – can cause a massive Hepatic Necrosis, due to Halothane Exposure, where Halothane Metabolites produce autoantibodies against Hepatocytes.
- **Thioridazine** – anti psychotic causes Retinal Deposits (Retinitis Pigmentosa). Chlorpromazine usually causes Corneal Deposits.
- **N-AcetylCysteine** – provides Sulfhydryl groups and thus binds the toxic metabolites of Acetaminophen, and also it is useful in loosening the mucus plugs in CF patients, where it breaks sulfide bonds by providing Sulfhydryl groups.
- **Amyotrophic Lateral Sclerosis** – causes loss of neurons in Anterior Horn (LMN Lesion) where it causes muscle weakness and atrophy. Demyelination of Lateral Corticospinal Tract (UMN Lesion) will cause spasticity and hyperreflexia.
- **Nitrates and High Blood Pressure** – nitrates cause vasodilation and Reflex Tachycardia kicks in when the body senses the drop in BP, so to avoid Tachycardia, you must administer Beta Blockers.
- **Loss of Contractility of a Muscle** – usually occurs within 60 seconds of Ischemia and Lactate will accumulate.
- **ACE Inhibitors** – may produce Angioedema
- **Symptoms of Raynaud Phenomenon** – are usually treated with Calcium Channel Blockers.
- **Hemiballismus** – associated with wild flinging of extremities on 1 side of the body indicates damage to Subthalamic Nucleus, usually due to a Lacunar Stroke.
- **Menopause** – is associated with increased levels of FSH.
- **Busprione** – is a first line treatment of Generalized Anxiety Disorder and usually takes 2 or more weeks to show full effect.
- **Primary Oocytes** – are arrested in Prophase of Meiosis I, and remain there until puberty. At puberty, it starts Meiosis II and gets arrested until fertilization in Metaphase of Meiosis II.
- **Classical Conditioning** – is when a person has a reaction to a stimulus, like White Coat Anxiety, where White Coat is a Conditioned Stimulus for Anxiety.
- **Left Atrial Enlargement** – can impinge Left Recurrent Laryngeal Nerve and cause Hoarseness
- **Amiodarone** – Class III Anti Arrhythmic and can cause Thyroid Dysfunction (it's 40% Iodine by Weight), Corneal Deposits, Blue Skin Discoloration, Pulmonary Fibrosis or Liver Dysfunction.

- Mutation with FAS gene – impairs CTL to delete self reacting T-Lymphocytes and thus can cause an auto-infection of different organs, such as seen in SLE.
- VPL – receives input from Spinothalamic and is a relay for Pain, Temperature, Proprioception.
- VPM – is a relay for Gustatory Pathways
- Lateral Geniculate Body – pathway for Vision
- Medial Geniculate Body – pathway for Auditory.
- Olfactory – doesn't have a relay through the Thalamus.
- Glycoprotein in Whipple's Disease – stains well with PAS and is resistant to Diastase. It stains Red with PAS and is an excellent way to diagnose Whipple's
- HIV + Patients – often undergo reactivation of EBV Virus
- Absolute Risk Reduction = Event Rate in Placebo ($25/1000 = 2.5\%$) – Event Rate in Treatment ($10/1000=1\%$) Thus it's equal to 1.5% or 0.015.
- Number Needed to Treat = $1/ARR$ $NNT = 1/0.015=0.66$ or 66%
- Aflatoxin – present in different Molds of Grain, cause a mutation of G to T of p53 Gene and will cause Hepatocellular Carcinoma. Usually seen in Asian Countries.
- Methacholine Challenge – can be used in patients to diagnose Asthma, since it's a Muscarinic Cholinergic Agonist, it will increase Bronchial Smooth Muscle Contraction and Mucus Production.
- Etanercept – Alpha Tumor Necrosis Factor Antagonist, and is used in treatment of Severe Rheumatoid Arthritis, especially in patients who failed Methotrexate Therapy.
- Check for PPD, since it causes Reactivation of Tuberculosis.
- Woollsorter's Disease – is caused by Bacillus Anthracis, and has a structure where it has D-Glutamate instead of Polysaccharide.
- COX 2 Enzyme in Colon Cancers – increased expression of COX 2 enzyme, has been seen in Colon Adenocarcinomas and Polyposis, so prevention with NSAIDS has been useful
- Fexofenadine – Second Generation Anti Histamine that causes minimal sedation
- Mucor Rhizopus Infection – causes fungus in Ketoacidosis Diabetic Patients and must be Biopsied to Diagnose. It branches at 90 degree angles and Aspergillosis at 45 degrees
- Lamotrigine – anticonvulsant used in Refractory Partial Seizures and has been shown to cause a Hypersensitivity Rash as a Side Effect.
- Prolactinomas – associated with increased production of Prolactin will suppress GnRH and thus causes Osteoporosis by decreasing levels of Estrogen.
- Atherosclerotic Plaque – expresses increased number of PDGF and causes adherence of Platelets to it and thus increasing Intimal Thickness.

- Intussusception – usually seen in children less than 2 years of age and are presented with a mass in the abdomen, poor feeding and Currant Jelly Stool
- NSAID in Acute Gout – are the first line of treatment in patients presenting with Acute Attacks of Gout, Glucocorticoids are used as a first line of treatment in Elderly Patients or those with Renal Failure.
- Loss of Nissl Substance in Neurons – indicates an Irreversible Damage to a Neuron
- Left Sided Colon Cancers – usually present with Obstruction Type of Symptoms, where Right Sided Colon Cancers present with Iron Deficiency Anemia, since they tend to bleed.
- Mutation of K-Ras gene – usually causes an increase in Growth of Colonic Polyp.
- Mutation in APC Gene – usually causes Adenomatous Polyps
- Mutation of p53 gene – usually causes a Malignant Transformation of Adenomatous Polyps.
- Odds Ratio – is calculated from formula $OR=ad/bc$
- Relative Risk – is $[a(a+c)]/[b(b+d)]$
- Incomplete closure of Caudal Region – of abdomen, will cause extrophy of the bladder or cloaca extrophy
- Fibrates and Bile Resins – will increase cholesterol content of bile and increase the risk of gallstones. Fibrates are drugs like Gemfibrozil and Bile Resins are Cholestyramine
- Extracellular Propeptidases – cleave disulfide rich extensions from procollagen molecule and thus will form triple helix.
- Niacin – decreases synthesis of triglycerides and VLDL, by suppressing the release of fatty acids from peripheral tissue. Side Effects are flushing, which can be prevented by administration of Aspirin.
- Shiga Like Toxin – produced by E.Coli are identical in structure to Shigella Toxin, work by inhibiting 60S subunit of ribosomal protein and thus preventing protein synthesis
- Toxic Shock Syndrome – has superantigen, which interacts with MHC complex on antigen presenting cells and T-lymphocytes and they cause widespread of activation of T cells with release of IL-2 from T-cells, IL-1 and TNF from macrophages.
- Hepatitis D antigen – must be coated by external coat HBsAg antigen of Hepatitis B Virus.
- Blastomycosis – can cause a pulmonary disease in immunocompromised patients, where Aspergillus may cause aspergillosis in old cavities created by TB etc.
- Methotrexate – inhibits dihydrofolate reductase and side effects include stomatitis (mouth ulcers) and hepatotoxicity.
- Biopsy in Hirschprung Disease – must include the submucosa of the narrow part, because usually submucosa and myenteric plexus are absent in this disease.
- Poststreptococcal Glomerulonephritis – is usually caused by accumulations of Immune Globulin Deposits.

- **Glucose Transport** – into cells occurs by **Facilitated Diffusion**
- **TCA antidepressants** – such as **imipramine**, **amitriptyline**, must be used with caution in patients with **BPH**, because they have strong **anti-cholinergic** side effects and may cause **acute urinary retention**
- **Enterococci** – produce **aminoglycoside modifying enzymes**, that transfer chemical groups and will impair an antibiotic binding and thus resistance
- **IgA Protease** – facilitates **Mucosal Penetration**.
- **Nitroglycerin** – works primarily as a **Venodilator**, where cardiac workload is decreased, because the blood is collected in the venous system and thus the **preload** is decreased as well
- **Release of Lysosomal Enzymes** – from ischemic tissue in the brain, results in **necrosis** of the tissue in the affected region.
- **Anencephaly** – along with **duodenal**, **esophageal** or **intestinal atresia** are the main cause for **Polyhydramnios**, where the **swallowing** is decreased.
- **TB Meningitis** – will result in a **Communicating Hydrocephalus**, where the impaired function is of **Arachnoid Granulations**.
- **RhoGam Therapy** – where the **Rh- negative** mother is given an **Anti D Globulin**, and that globulin is **IgG**.
- **Common Peroneal Nerve** – is mostly commonly injured in the trauma near the head of fibula and will cause **Foot Drop**.
- **Calcium during Muscle Contraction** – will cause an increased degradation of **Glycogen** and have it converted into **Glucose-1-phosphate**.
- **Risk of Fractures** is lower in **Blacks** – some of the risk factors of **osteoporosis** are **smoking**, **menopause**, **corticosteroid therapy**, **Caucasian race**, **physical inactivity**, **alcohol use**.
- **Collagen Molecule** - has a **triple helix formation**, where there is a **Glycine Amino Acid** in every third position.
- Patients presenting with signs of **Polydipsia** – **polyuria** but at the same time they have **Hyponatremia**, are usually caused by **Psychogenic Polydipsia**, or **Pathologic Water Drinkers**.
- **Aldosterone** – increase **sodium** and **water reabsorption** in the **collecting ducts**.
- **ADH** – increases **water reabsorption** in the **collecting tubules**.
- **Retinoblastoma Protein (Rb)** – is a **regulator** of **G1 to S phase transition**.
- **p27 protein** – is a **cell cycle inhibitor**, so malignant cells will have low number of **p27** cells.
- **Gluconeogenesis** – is a major controller of **glucose**, during an **overnight fast**, where it converts **pyruvate** to **oxaloacetate** and **oxaloacetate** to **phosphoenolpyruvate**.
- **ADH acts in Medullary Segment** – of **collecting duct**, where it acts to **absorb water**

- **Aldosterone** – mainly acts in Cortical Segment of Collecting Ducts.
- **Staph. Scalded Skin Syndrome** – produce Exfoliating Exotoxin, and there is a presence of Nikolsky Sign.
- **Memory Loss and Confabulations** – are hallmarks of Korsakoff Syndrome and are permanent deficits, which don't change with Vitamin Supplementation.
- **Risperidone** – is an anti-psychotic, that blocks D2 synthesis of Dopamine, and thus its side effects are Hyperprolactinemia, that will cause Amenorrhea.
- **Avascular Necrosis** – of femoral head are the major complications of Sickle Cell Anemia, Systemic Lupus and Steroid Therapy.
- **Damage to Organ of Corti** – occurs from prolonged exposure to extremely loud noises.
- **Ergot Compounds** – such as Pergolide and Bromocriptine, are associated with Side Effects that cause Raynaud Phenomenon.
- **Enterococcal Endocarditis** – is usually seen in elderly patients who have undergone a procedure such as colonoscopy, where Enterococcus has infected and caused Endocarditis
- **Growth Factors and PDGF** – rely on Tyrosine Kinase and MAP pathways, and RAS protein is a part of MAP pathway.
- **Villous Adenomas** – can look like Cauliflower and secrete a lot of mucus, that will cause diarrhea and thus Hypovolemia
- **Jervell and Lange Nielsen Syndrome** – is associated with Neurosensory Deafness and QT prolongation.
- **ARDS Patients** – will have a normal Pulmonary Capillary Wedge Pressure, where there is no edema involved.
- **Red Ragged Muscle** - is seen on the biopsy in Mitochondrial Myopathy. This is a mitochondrial disease and thus only transmitted through mother.
- **Caudal Regression Syndrome** – where Sacral Agenesis causes lower extremity paralysis is usually seen in mothers with poorly controlled diabetes.
- **Niacin** – is the most effective in raising HDL levels. Omega fatty acids will raise HDL but at very low levels.
- **Patients with CF**- their symptoms might be corrected with administration of Pancreatic Enzymes, since they have its deficiencies.
- **Infiltrative Ophthalmopathy** – is usually seen in Hyperthyroid Patients where their ocular muscles are infiltrated by glycosaminoglycans and hence there is Exophthalmos.
- **Best indicator of MS stenosis level** – is a length of interval between S2 and OS (opening snap)
- **Lipooligosaccharide (LOS)** – of N. Meningitidis is analogous to Lipopolysaccharide of Gram Negative Rods and this will determine the severity of the disease. Usually seen in military recruits.

- Patients older than 65 – are prone to developing pneumonia after Infection with Influenza, and the causative agents are Strep. Pneumonia, Staph. Aureus and H. Influenza
- Patients with ANtiphospholipid Antibody Syndrome with Lupus – present with positive VDRL test, have Anti-Phospholipid Antibodies circulating. These antibodies are associated with increased risk of Thromboses, Miscarriages
- ACE – is expressed in the Lung Vascular Endothelium and converts Angiotensin I to functional Angiotensin II
- Preload will increase End Diastolic Sarcomere Length – in the ventricular myocardium, and will increase Stroke Volume and Cardiac Output.
- Insulin – activated Protein Phosphatase in the cells, and it works through Tyrosine Kinase receptor in the cells to stimulate synthesis of fatty acids, protein, glycogen.
- Patients with Bilateral Cataracts and no Hepatic Involvement – have a deficiency of Galactokinase and thus Galactose is shifted and converted into Galactitol by Aldose Reductase and thus it accumulates in the lens of the eye without Hepatic Involvement.
- Patients with Classic Galactosemia – have a deficiency of Galactose 1-phosphate Uridyl Transferase deficiency and thus G1P accumulates and will cause lethargy, vomiting and will present with Cataracts.
- Mycoplasma – lacks a cell wall, so antibiotics such as PCN, Cephalosporins and Vancomycin will not be effective in these bacteria. So it must be treated with Tetracyclines and Erythromycin that act on Ribosomal Subunits.
- Reid Index – is a ratio of Mucus Gland Layer to the total thickness of cell wall and cartilage, and this is an index of progression of Bronchitis.
- Agranulocytosis – might be caused by Anti-Thyroid Drugs, so WBC counts must be checked prior to administration.
- Pituitary Apoplexy – is a complication of Hemorrhage into Existing Pituitary Adenoma. It will present with Severe Headache and Cranial Nerve Involvement.
- Crohn's Disease will present with Oxalate Stones – because impaired bile acid absorption, caused by fat malabsorption, will cause the loss of Calcium in the bile, and since Calcium binds Oxalate, then there will be a formation of Oxalate Stones.
- Capsule of Strep. Pneumonia – is the major Virulence Factor, and it will swell up when Anti-Capsule agents are added.
- Endocarditis caused by Staph. Aureus – usually occurs in IV drug abusers, or individuals with unaffected valves, and primarily affects the Tricuspid Valve. While Strep. Viridans usually involved Mitral Valve and is due to dental work etc.
- Absolute Relative Risk – is calculated $\text{Event Rate (control)} - \text{Event Rate (treatment)}$
- Ethanol and Pancreatitis – ethanol induces secretion of Pancreatic Juice with a high content of Protein and Low Fluid. Thus the secretions are viscous and will form plugs and obstruct bile flow.

- **Nasal Mucosal Ulcerations and Glomerulonephritis** – is seen in Wegener's Granulomatosis and will have Anti-Neutrophil Antibodies (c-ANCA)
- **Proton Pump Inhibitors** – are the drug of choice for Gastrinomas, which secrete Gastrin.
- **Acetyl CoA** – is an allosteric activator of Gluconeogenesis and acts by increasing activity of Pyruvate Carboxylase.
- **Cortisol** – increases the transcription of enzymes involved in Gluconeogenesis
- **TCA overdose** – may have a Quinidine like Side Effects where they might cause QRS and QT interval prolongation and to reverse that, Sodium Bicarbonate must be used.
- **Digitalis Toxicity** – might be treated with supplementation with Potassium, since it blocks Na/K channel
- **To calculate the Risk** – divide the number of diseased individuals by the total number of patients in the group.
- **Subperiosteal Thinning** – is a feature of Hyperparathyroidism, where there is an increased resorption of the bone.
- **Alkaline Phosphatase** – is a group of enzymes involved in many different organs, such as liver, bone, intestine, kidney. To clarify whether it's the liver infection, you must measure GGTP levels – which are Gamma Glutamyl Transpeptidase.
- **Axonal Reaction** – is a repair of axons, where there is a nucleus pushed to the side and the cell is compressed and finely granular Nissl substance is seen.
- **Cortisol** – sensitizes vasoconstrictive effects of Catecholamines and thus exerts Permissive Effects on the Vasculature.
- **Endogenous Administration of Thyroid Hormone** – such as Levothyroxine, will increase the Free Levels of T3 and thus in its turn suppress TRH and then TSH levels.
- **Pentazocine** – is an opioid narcotic with partial agonist activity and weak antagonist activity on Mu Receptors. Administration of this drug in patients dependent on opioids, might trigger an Opioid Withdrawal Symptoms.
- **GTP** – is synthesized in the Succinyl CoA reaction in TCA cycle, and used as an energy source for decarboxylation of Oxaloacetate to Phosphoenolpyruvate by PEP Carboxykinase in Gluconeogenesis.
- **Lysine and Leucine** – are strictly Ketogenic Amino Acids and would not increase blood Lactate Levels in patients with Pyruvate Dehydrogenase Deficiency.
- **Patients with Friedrich's Ataxia** – present with degeneration of Dorsal Columns, as well as 50% of them will develop Hypertrophic Cardiomyopathy.
- **HBsAg** - is a component of the envelope of Hep. B virus and will form spheres and tubules.
- **Transposition of Great Arteries** – results from failure of Aorticopulmonary Septum to Spiral during Septation.

- **Ataxia Telengectasia** – is an autosomal recessive, where there is a Cerebral Atrophy that will lead to ataxia, these patients are also susceptible to DNA radiation, since they have a deficiency of Exonuclease activity.
- **Terbinafine** - is a common drug used for Dermatophytosis, where it inhibits synthesis of Ergosterol by inhibiting Enzyme Squalene Epoxidase.
- **Acute Pancreatitis** – is usually caused by Gallstones and Alcoholism, high levels of Triglycerides lead to increased production of Fatty Acids.
- **Astrocytes** – are found at the periphery of the infarct, and are responsible for maintaining the same form, they are responsible for Gliosis.
- **Supraspinatus** – is an Abductor of the arm, vulnerable to injury due to impingement between acromion and the head of the Humerus.
- **Subscapularis** – is responsible for Medial Rotation of the Arm
- **Latissimus Dorsi** – is the major Adductor of the Arm.
- **Neurons** do not store Glycogen – and are highly sensitive to Ischemia, profound hypotension during Cardiac Arrests will cause Global Cerebral Ischemia.
- **De Quervain Thyroiditis** – or Granulomatous Thyroiditis, presents after Viral Infections and will present areas of infiltration by Lymphocytes and Multinuclear Giant Cells.
- **Ceruloplasmin** – and unabsorbed copper will be Secreted into Bile and excreted Hepatically in the stool
- **Dystrophic Calcification of Aortic Valves** – is preceded by the Cell Necrosis, where there is a destruction by Calcification and that will cause Aortic Stenosis.
- **Procollagen** – is synthesized within Endoplasmic Reticulum, then it's released into Extracellular Space by transport through Golgi, and then converted into Collagen by peptidases that will cleave off N and C terminal portions. Only then they are crosslinked with other Collagen Molecules after residues are oxidized by Lysyl Oxidase.
- **Malassezia Furfur** – are characteristics of Pityriasis Versicolor and appear as Spaghetti and Meatballs.
- **Abdominal Aorta** – is mostly involved in the process of Atherosclerosis, then followed by Coronary Arteries, Popliteal, internal carotids and Vessels in the Circle of Willis.
- **Extrahepatic Biliary Atresia** – is a congenital obstruction of Extrahepatic Bile Ducts seen by the 3rd week of Life.
- **C peptide and Insulin** – packaged together into secretory granules and are released into an extracellular space.
- **Fenfluramine and Phenteramine** – extensive consumption of Appetite Suppressors is associated with the risk of Pulmonary Hypertension. Which can progress to Cor Pulmonale.
- **Henoch Schonlein Purpura** – consists of Leukocytoclastic Angiitis and associated with deposits of IgA and C3, and is common in children between 3-11 after recent infection.
- **Lack of T tubules** – would lead to uncoordinated contraction of individual fibers in myofibrils.

- **Ureteric Bud** – gives rise to collecting ducts, minor and major calyces, renal pelvis and ureters.
- **Metanephric Mesoderm** – gives rise to Glomerulus, Bowman's capsule, proximal, distal convoluted tubes and a connecting tubule
- **Pulmonary Vascular Sclerosis** – will occur in patients with Eisenmenger Complex.
- **Low Volume of Distribution of the Drug** – such as 4-5 L, may be due to High Molecular Weight, High Plasma Protein, Hydrophilicity and High Charge
- **Staph Epidermidis** – must be treated with Vancomycin and Rifampin.
- **Indirect Inguinal Hernias** – are located Laterally to Inferior Epigastric Vessels
- **Direct Inguinal Hernia** – is located Medially to Inferior Epigastric Vessel.
- **MAO Inhibitors** – such as Phenelzine and Tranylcypromine, are particularly useful in treatment of Atypical Depressions, such as in patients with Hyperphagia and Weight Gain.
- **Osteoarthritis** – will present with Short Morning Stiffness, and will involve DIP and PIP joints.
- **Rheumatoid Arthritis** – will present with a Long Morning Stiffness that will improve with Exercise, and will involve MCP and PIP joints.
- **Spironalactone** – may be used in a female that complains of increased Hair Growth on her face, since it will block androgen receptors at hair follicles and decrease production of Testosterone.
- **CFTR** – is an ATP gated transmembrane ion transporter that pumps Chloride ions out of the cell against a Concentration Gradient.
- **Lead Time Bias** – is an artificial increase in the survival time among tested patients, who actually have an unchanged diagnosis
- **Hepatitis B Prodromal Period** – may last from 30-180 days, will present with the Serum Sickness Symptoms, where patients will experience fever like condition, skin rash, and lymphadenopathy.
- **V. Cholera** – doesn't invade the Intestinal Mucosa, so it will present with watery mucus and some epithelial cells.
- **Chronic Rejection of a Transplant** – will present with Obliterative Intimal Smooth Muscle Hypertrophy and Fibrosis.
- **Improperly Fitted Crutches** – will impinge the Radial Nerve and cause symptoms such as inability to Flex the Arm and Wrist
- **Thyroid Hormones** – alter Gene Transcription by Binding to Receptors Inside the Nucleus.
- **Protein M** – is a major Virulence Factor of Strep. Pyogenes and Inhibits Phagocytosis and Complement Activation
- **Lancet Shaped Gram Positive Diplococci** – is indicative of Strep. Pneumonia, which is Optochin Sensitive.

- **Polyribosyl Ribitol Phosphate (PRP)** – is a part of H. Influenza Capsule and is part of Hib Vaccine and its conjugated with Diphtheria and Tetanus Toxoid.
- **Posterior Urethral Trauma** – is associated with Pelvic Fractures, and it will present with Inability to Void, despite Full Bladder and Elevated Prostate on Rectal Exam.
- **Retinal Damage in Infants** – will usually be due to Reperfusion Oxygen Damage, in infants born with Respiratory Distress Syndrome.
- **Use of Terbutaline** – will present in Infants with Intracranial Hemorrhage, Hypoglycemia, Hypocalcemia and Ileus.
- **Reye's Syndrome** – due to ASA in patients treated for Influenza or Varicella Infection and will present with Microvesicular Steatosis of Hepatocytes.
- **Porcelain Gallbladder** – Calcium Ladden Gallbladder and will increase the risk of Gallbladder Carcinoma
- **Hereditary Pancreatitis** – may be due to mutation which would activated Trypsinogen to convert into Trypsin and it would auto digest Pancreas, before it would be released into duodenum as normally.
- **Lithium** – causes Nephrogenic Diabetes Insipidus, Hypothyroidism and associated with Ebstein's Anomaly.
- **Osler Weber Rendu Syndrome** – Hereditary Hemorrhagic Teleniectasia, may affect the Lips, Oropharynx, Respiratory Tract, Skin, GI tract.
- **Von Hippel Lindau** – Capillary Hemangioblastomas in Retina and Cerebellum, presents with Congenital Cysts in Liver, Kidney, Pancreas and Increased Risk of Renal Carcinoma
- **Tuberous Sclerosis** – may cause cysts in the liver, kidney, but in CNS it will be Subependymal Hamartomas, Renal Angiomyolipomas and Cardiac Rhabdomyoma, clinically will present with Seizures!!!
- **Sturge Weber** – will present with Cutaneous Facial Angiomas, as well as Leptomeningeal Angiomas, patients will have Mental Retardation, Seizures and Skull will have Tram Track Calcifications.
- **Aging** – will present with Decreased Ventricular Size at the Apex and will cause Sigmoid Septum.
- **Fc Portion Closer to the Hinge Region** – is where Complement Binds.
- **Heme** – serves as a Negative Feedback on ALA Synthase. Diagnosis of Accute Intermittent Porphyrria is made by increase in Aminolevulinic Acid and Porphobilinogen
- **Duodenal Ulcers Location** – is near Pylorus because of the most Acid Present.
- **Infants with Bilateral Renal Agenesis** – will present with Respiratory Problems, since Amniotic Fluid that needs to be swallowed and urinated out, is essential in the process of Lung Maturation
- **LH** – stimulates Leydig Cells to Produce Testosterone, FSH will stimulate Sertoli Cells to Produce Inhibin B, which will Negatively Feedback on LH and FSH
- **Until 4 hours** – into Ischemia will not present with any changes on Light Microscopy

- **Bosental** – is an Oral Endothelin Receptor Antagonist and is used in Patient with Pulmonary Hypertension
- **Reperfusion Arrhythmia** – may be due to Fibrinolytics that will cause Reperfusion on Arterial Re-Opening.
- **Acute Fibrinous or Serous Pericarditis** – acute onset Pleuritic Chest that decreases on Sitting Up and Leaning Forward.
- **Cardiac Defects in DiGeorge Syndrome** – are associated with Tetralogy of Fallot and Interrupted Aortic Arch
- **Addition of Spironolactone** – will significantly Reduce Mortality in Heart Failure Patients, since it will block Aldosterone.
- **Chocolate Agar for Neisseria Gonorrhea** – consists of Vancomycin, Polymixin and Trimethoprim.
- **Cryptococcus** – that is Round Budding Yeast with Clear halos will cause Meningitis in HIV + Patients.
- **Down Syndrome** – patients will have Ostium Primum Endocardial Cushion Atrial Septal Defect.
- **Nifedipine** – is a selective Vascular Calcium Channel Blocker and is different from Calcium Channel Blockers used in Arrhythmias
- **Slow Onset of Anesthetic** – is associated with High Solubility of the Drug
- **Thrombocytopenia in Hospital Patients** – is mostly due to Heparin Infusions, and is more present with Unfractionated Heparin rather than Low Molecular Weight.
- **On Off Phenomenon** – seen in Parkinson Patients where they will have days with Increased Mobility and other times with Decreased, that is due to the effect of L-Dopa Therapy.
- **Cauda Equina Syndrome** – will present with Saddle Anesthesia and Loss of Anocutaneous Reflex, and that will involved a Lesion from S2 – S4 Areas.
- **Differential Cyanosis** – in Upper and Lower Extremities is due to PDA.
- **Alzheimer's Disease** – mostly affects Hippocampus and Frontal Lobe
- **Alpha 1,4 Glucosidase** – deficient in Pompe's Glycogen Storage Disease is also Called Acid Maltase
- **C-Myc** – is a nuclear Phosphoprotein and functions as Transcription Activator that controls Cell Proliferation, Differentiation and Apoptosis
- **Bcr –Abl** – encodes a Protein that Inhibits Apoptosis while Promoting Mitogenesis and Increased Tyrosine Kinase Activity.
- **Poststreptococcal Glomerulonephritis** – will present with Elevated Anti Streptolysin (ASO) titers, Decreased C 3 and Total Complement Levels and presence of Cryoglobulins. C4 Levels are usually Normal.
- **Attributable Risk Percent ARP** – is calculated by $RR-1/RR$

- **Celiac Disease** – must be diagnosed with Colon Biopsy where there is Flattening of Mucosa, Loss of Villi and Chronic Inflammatory Infiltration of Lamina Propria.
- **Apolipoprotein E -4** - may be involved in formation of Senile Plaques in Alzheimer's Disease
- **Beta HCG** – is detected in maternal serum on the 8th day, but can take as long as 11. Blastocyst implants itself on the 6th day
- **Hibernating Myocardium** – can be caused by repetitive ischemia of the myocardium or persistent hypoperfusion, and when the blood flow is restored it will regain the circulation and strength
- **Glucagonoma** – are pancreatic tumors that are characterized by necrolytic migratory erythema, erythematous rash affecting the groin
- **Pancoast Tumors** – are Superior Sulcus Tumors characterized by Ipsilateral Horner's Syndrome, rib destruction and other upper extremities' deficits in the distribution of C8, T1 and T2
- **Alanine** – can be Transaminated by Alanine Aminotransferase to Pyruvate with Amino Group transferred to Alpha Ketoglutarate to form Glutamate
- **HbS** – where charged Glutamic Acid Residue is replaced by Nonpolar Hydrophobic Valine Residue at the 6th position and will cause aggregation of Hemoglobin under Hypoxic Conditions
- **Chemoreceptor Trigger Zone** – is located at the base of 4th Ventricle, at the Dorsal Surface of Medulla.
- **Duration of Diastole** – is a critical factor in determining Coronary Blood Flow
- **Ergot Compounds and Nonergot Compounds** – Directly Stimulate Dopamine Receptors. Ergot Compounds (Bromocriptine and Pergolide) and Nonergot Compounds (Pramipexole and Ropinerole)
- **Patients on Thiazides** – have overall higher levels of Calcium and thus it's bone protective, so Hypocalciuria will decrease formation of Renal Stones
- **Nonnucleoside Reverse Transcriptase Inhibitors** – do not need to be phosphorylated to be activated and some of them are: Nevirapine, Efavirenz and Delavirdine
- **HIV Associated Esophagitis** – is caused by Candida, CMV and Herpes Virus
- **After MAO Therapy** – it will take 2 weeks to regenerate enzyme, to have adequate neurotransmitter metabolism
- **Primidone** - is metabolized to Phenobarbital and PEMA, all three are active compounds that are Anticonvulsants
- **Superior Mesenteric Artery Syndrome** – when Transverse Portion of Duodenum is trapped between SMA and Aorta. That can happen due to rapid weight loss.
- **Bronchogenic Carcinoma** – is the most common Lung Cancer due to Asbestos Exposure, where Mesothelioma is 2nd Most Common.
- **Majority of Anal Fissures** – occur in the Posterior Midline Distal to the Dentate Line.

- **Pyrazinamide** – is effective in Acidic Environment, where other TB drugs are effective against extracellular mycobacteria.
- **Liver Cirrhosis and Hepatocellular Carcinoma** – are 2 outcomes associated with mutation of HFE protein which promotes attachment to Transferrin Protein and Facilitates Iron Absorption, which are seen in Hemochromatosis
- **Acute Rheumatic Fever** – is the most common cause of Mitral Stenosis. Where Infective Endocarditis is more associated with Vegetations and Destruction of the Valves.
- **Valproic Acid** – is the first line therapy for Myoclonic Seizures. Where Phenyotin and Carbamazepine are 1st line in Tonic Clonic Seizures.
- **Nephrotic Syndrome** – will present with loss of Antithrombin III and that's why will present with Thrombosis
- **H. Influenza B Vaccine** – is mixed with Diphtheria and Tetanus Toxoid, and this in turn will Increase Immunogenicity of the Vaccine, where Conjugate becomes T cell dependent Antigen
- **Carcinoid Heart Disease** – will present with Fibrous Intimal Thickening with Endocardial Plaques and will be limited to Right Heart. The symptoms are flushing, wheezing and diarrhea, due to production of Serotonin, Kalikrein, Bradykinin, Histamine etc.
- **Lispro and Aspart** – are the best Short Acting Insulins
- **Hydrocele and Indirect Hernia** – are formed by a similar mechanism. Both are caused by incomplete Obliteration of Processus Vaginalis.
- **Gallstone Ileus** – will cause an obstruction of the bowel and will present with Air in the Biliary Tract.
- **Increased Fecal Blood Loss** – is the side effect of ASA Therapy. Because there is a loss of Gastric Protection in addition to Impaired Platelet Aggregation.
- **HSP 90 and HSP 56** – are Heat Shock Proteins that bind Inactive Zinc Fingers that are involved in Steroid Hormone Synthesis.
- **Complications of Ankylosing Spondylitis** – may be impaired Pulmonary Ventilation due to deformation of the spine, and in the heart it will present with Ascending Aortitis leading to Dilatation of the Aortic Ring.
- **Colon Cancer** – most common location for this is Ascending Colon, which will present with Bleeding, where the Left Side that would involve Recto Sigmoid Region would present with Obstruction.
- **Spread of Bronchogenic Carcinoma** – may present with Obstruction and Compression of Upper Vasculature such as Vena Cava, and patients will present with Facial Swelling, Dilated Carotids.
- **Hypermethylation of Histones** – is the cause of Altered Gene Expression of Huntington Disease.
- **Gastroduodenal Artery** – is mostly eroded by Posterior Duodenal Ulcers and can be a source of Life Threatening Hemorrhage
- **Femoral Hernias** – will present with a Bulge in the Upper Thigh, and will be accentuated on Valsalva Maneuver.

- **Pol Gene Mutations** – render the ability of HIV Retroviral Therapy to take its effect
- **Treatment for Gonococcal Infection** – must always involve treatment for Chlamydia, since it often co infects at the same time. Ceftriaxone is used for N. Gonorrhea and Azithromycin or Doxycycline are used for Chlamydia
- **NF-kB Protein** – activity is reduced in Crohn's Disease and this protein is responsible for Cytokine Production
- **Acarbose and Miglitol** – are Alpha Glucosidase Inhibitors that decrease Activity of Membrane Bound Disaccharides on the Intestinal Brush Border.
- **Increase in cAMP in Vascular Smooth Muscle** – will cause Vasodilation, which is a Side Effect of Phosphodiesterase Inhibitors in Hypotensive Patients.
- **Fibrinous or Serofibrinous Pericarditis** – develops in 20% of the Post MI patients between day 2 and 4, due to infiltration of Inflammatory Cells of the Transmural Infarction. Dressler Syndrome occurs on Day 7 and is an Autoimmune Process.
- **Niacin and Fibrates (Ezetimibe)** – are the most useful Treatment in patients with Hypertriglyceridemia
- **Airway Resistance** – is Minimal in Bronchioles and Maximal in Large Segments of Bronchi.
- **Cold Agglutinins** – are antibodies that will be produced in Response to Mycoplasma Pneumonia Infection, also might be present with Epstein Barr Virus Infection
- **Calcium Channel Blockers** – might present with AV Nodal Blocks and Bradycardia
- **Local Defense against Candida** – is produced by T cells, that's why we see Local Candidiasis in HIV+ Patients, since their T cell Levels are Low
- **Defense against Systemic Candidiasis** – is produced by Neutrophils, that's why Neutropenic Patients will present with Systemic Candidiasis
- **To prevent Neonatal Tetanus** – is to ensure that Mothers are Vaccinated with Toxoid to allow transfer of IgG Toxoid through Placenta
- **Cervical Cancer Risk** – Number 1 is History of Sexual Partners, since HPV can be transmitted
- **Endometrial Cancer Risk** – is due to Nulliparity, early Menarche and Obesity, where increased Estrogen Stimulation of the Endometrium
- **Breast and Ovarian Cancers** – Number 1 Risk is Family History
- **Minimal Change Disease** – is usually due to the Loss of Polyanion in the Basement Membrane, which will lose the Charge.
- **Rifampin** – is used as Prophylaxis against Meningococcal Diseases, as it will Penetrate into Respiratory Tract and Eliminate Nasopharyngeal Colonization
- **Niacin** – or Nicotinic acid has been used to treat Hyperlipidemias, the side effects of Flushing are due to release of Prostaglandins

- **Left Ventricular Dysfunction** – will cause **Pulmonary Vessel Vasoconstriction** and will contribute to **Pulmonary Hypertension**
- **Digitalis Toxicity** – will present with **Hyperkalemia** and at times with **Bradycardia, Ventricular Tachycardia or Fibrillation**
- **Splitting of S2 in ASD** – will be permanent and will not change with **Respiration**
- **Sixth Aortic Arch** – gives rise to **Pulmonary Arteries and Ductus Arteriosus**
- **Neuropathic Incontinence** – with **Neurogenic Detrusor Spasticity**, will result from damage from **T11 till L2**, will cause relaxation, since those nerves inhibit it. **S2-S4** are responsible for excitation of the bladder
- **MCHC** – **Mean Corpuscular Hemoglobin Concentration** is the best Index in making **Diagnosis of Hereditary Spherocytosis**, **Diagnosis** is best confirmed with **Osmotic Fragility Test**
- **Musculocutaneous Nerve** – provides innervation of **Flexor Muscles of upper arm** **Sensory to the Lateral Part of the Arm**
- **Haptoglobin** – binds **Free Hemoglobin**, in **Intravascular Hemolysis**, due to destruction of **Erythrocytes**, **Free Hemoglobin** Increases, and Exceeds levels of **Haptoglobin** and thereby **Decreasing the Levels of Haptoglobin**
- In **HIV** – **Nucleocapsid Proteins p24 and p7** are from **GAG Gene**. **Envelope Glycoprotein gp41 and gp120** are from **ENV gene**. **Transcription and Translation** are from **POL gene**. **TAT and REV** are required for **Replication**
- **Dietary Fructose** – is **Phosphorylated in the Liver to Fructose 1 Phosphate** and **Rapidly Metabolized**, because it **Doesn't Pass through PFK 1**, which is a **Regulatory Enzyme of Glycolysis**.
- **Ecthyma Gangrenosum** – is a **Cutaneous Necrotic Disease** and it's associated with **Pseudomonas Aureginosa**. **P. Aeruginosa** are common in **Neutropenic, Diabetic, Burn Patients**.
- **Glucocorticoids and HIV-1 Protease Inhibitors** – are associated with **Cushingoid Appearance and Fat Distribution**
- **Gouty Arthritis** – is a **Side Effect of Niacin Therapy**, which increases **Serum Uric Acid**. **Hepatotoxicity** may occur at **High Doses**. In **Diabetics** it might cause **Hyperglycemia**
- **Amphotericin B** – **Polyene Antifungal** and its **Side Effects** are **Renal Failure with Hypokalemia and Hypomagnesemia**.
- **Antiphagocytic Polysaccharide Capsule in H. Influenza B** – has **Ribose** in it, instead of **Hexose** and may be the reason for **Increased Virulence**
- **Patients with Crohn's Disease** – are prone to developing **Gallstones**. **Decreased Bile Acid Reabsorption and Loss in the Feces** will increase **Cholesterol Levels** and formation of **Gallstones**
- **Polymyositis** – presents with **Symmetrical Muscle Weaknesses**, on **Biopsy** there is **necrosis, regeneration, large amounts of MHC I molecules infiltrated with CD8 T cells**.
- **Primary Biliary Cirrhosis** – **Autoimmune Destruction of Hepatic Bile Ducts and Cholestasis**.

- All Sickle Cell Patients – at some point will present with Asplenism and thus the increased risk of H. Influenza and Strep. Pneumonia Infections
- AL Amyloidosis – is Associated with Multiple Myeloma.
- Generalized Lymphadenopathy – is another Side Effect of Phenytoin, where it might present as a Lump in the Neck.
- Polycystic Ovarian Syndrome – is associated with Endometrial Hyperplasia, due to Unopposed Effect of Estrogen and Increased Risk of Endometrial Carcinoma. Patients also have a Higher Risk of Developing Type II Diabetes
- Hematogenous Osteomyelitis – will primarily affect Metaphysis of the Bone, due to Rich Vascularization
- Very Long Chain Fatty Acids – which Cannot Undergo Beta Oxidation, is due to Peroxisomal Absence or Defect, which will lead to Defects from Improper CNS Myelination
- Half Life – $Vd(.7)/CL$. 1 Half Life is 50%, 2 Half Lives is 75%, 3 Half Lives – 87.5%, 4 Half Lives – 93.75%
- Sarcoidosis – will usually present in African Americans with Dry Cough, Pulmonary Infiltrates and Hilar Adenopathy. On Biopsy it will be a Non Caseating Granuloma
- Major SE of Metformin – is Lactic Acidosis, which will damage the Kidneys and GI Upset.
- Anemia in SLE – is due to Autoimmune Hemolysis and will be due to formation of IgG Warm Antibodies to RBCs. Which is characterized by Spherocytosis, + Coombs Test, and there will be Thrombocytopenia, due to Antibodies against Platelets
- Benzodiazepines, Barbiturates and Alcohol – will Bind to GABA Receptor and Stimulate Influx of Chloride Ions into Neurons
- Mycoplasma Pneumonia – can cause Hemolysis, due to similarity between Antigens of Cell Membrane of M. Pneumonia and Cell Membrane of Erythrocytes
- Hydrocephalus Ex Vacuo – there is a Ventricular Enlargement in the Brain, which is Due to Atrophy of Cerebrum (Picks, Alzheimers). CSF Pressure is Not Increased
- Common Peroneal (Fibular) Nerve – is usually damaged when patients wear a Cast and compress the head of the Fibula
- Takayasu and Giant Cell Arteritis – are very similar in Mechanism. Takayasu involves Aorta and its Branches and it usually occurs in Patients Younger than 40. If Patients are older than 40, we presume it's Giant Cell Temporal Arteritis
- Skeletal Muscles are Resistant to Calcium Channel Blockers – because they largely Depend on Intracellular Calcium for Excitation and Contraction Coupling. Where Smooth Muscle depends on Extracellular Calcium
- PDGF – is largely secreted by Smooth Muscle Cells and it will promote migration to the Affected Site of Inflammation, with Production of Intimal Thickening and Collagen Deposition
- Palmar Erythema – will be due to Cirrhotic Hyperestrinism and it will also include Gynecomastia, Testicular Atrophy, Spider Nevi and Decreased Body Hair

- **TZDs (Thiazolidinediones) – New Group of Anti Diabetic Drugs, Decrease Insulin Resistance by Binding to Peroxisome Proliferator Activated Receptor Gamma, which is a Transcriptional Regulator of the Genes involved in Glucose Metabolism**
- **Benzodiazepines – are First Line in Alcoholic Seizures, because they will Substitute Alcohol Effect on GABA Receptors**
- **Adenomyosis – presence of Endometrial Glands in the Uterine Myometrium, and it will cause an Enlargement of the Uterus with Bleeding, and Painful Menses**
- **Endometriosis – presence of Endometrial Tissue Outside of the Uterus, it will present with Painful Menses, Dyspareunia, but no Uterine Enlargement**
- **Cause of Death in Acute Rheumatic Fever – in Rare Cases is Acute Myocarditis, where Mitral Stenosis takes years to form**
- **Adenosine – is DOC in treatment of Paroxysmal Supraventricular Tachycardia, where there are palpitations. Side Effects include Flushing, Burning in the Chest and Shortness of Breath**
- **Medullary Sponge Kidney – is characterized by Cystic Dilatations of Medullary Collecting Ducts. Cortex is spared. Patients will present with Kidney Stones and Hematuria.**
- **Lidocaine – is very Specific to Depolarized Tissue such as Ischemic Tissue. That is why it's a Treatment of Choice in Post Myocardial Infarction Arrhythmias**
- **Dysplasia – is different from Cancer, because it's Reversible, where Cancer is not.**
- **Atheroembolic Disease of Renal Arteries – will present with Renal Failure and Big Toe Discoloration in Elderly Patients**
- **CEA Levels – in patients with Colon Cancer are usually used to Monitor Tumor Recurrence**
- **Cryptococcus Neoformans – is the only Fungus that has a Polysaccharide Capsule, that appears Red on Mucicarmin Stain and Clear Unstained Zone on India Ink**
- **3rd Aortic Arch – gives rise to Common and Proximal Internal Carotid Arteries.**
- **4th Aortic Arch – gives rise to True Aortic Arch and portion of Subclavian Arteries**
- **6th Aortic Arch – gives rise to Pulmonary Arteries and Ductus Arteriosus**
- **MCA – supplies Broca's and Wernicke's Areas, Frontal Eye Fields, Face and Arm Areas of Motor and Sensory Cortex**
- **Shiga and Shiga Like Toxin of E.Coli – inactivated 60S Subunit of the Ribosome and thus inhibit Protein Synthesis and Eventual Death**
- **Formation of Biliary Sludge – will be formed due to Incomplete Emptying of Gallbladder in Response to CCK, thus Bile will Precipitate**
- **Chloramphenicol – will cause Aplastic Anemia, it will bind to 50S Subunit and Inhibit Peptidyl Transferase Enzyme**

- **Kallman's Syndrome** – will present with Delayed Puberty Plus Anosmia, where there is a Failure of GnRH Neurons to Migrate to Olfactory Placode and Hypothalamus. Boys will be feminine with Poorly Developed Secondary Sexual Characteristics
- **Intimal Tear** – is the Initiating Process of Dissecting Aortic Aneurysm
- **Weakened Vesicoureteral Junction** – will be due to Frequent Bladder Infections and will Facilitate Reflux
- **Suppression of 7 α Hydroxylase Activity** – due to the drugs such as Clofibrate, will reduce Solubilization of Cholesterol into Bile and there will be Excess Cholesterol
- **Deficiency of Lipoprotein Lipase** – will cause impaired Tryglyceride Clearance from Blood Stream. Lipoprotein Lipase is secreted from Uniloculated Adipocytes, which are Adipose Tissue, also by Skeletal and Cardiac Muscle
- **Effect of Hypothalamus on Prolactin** – is Inhibitory via Dopamine Production
- **Senile Cardiac Amyloidosis** – is due to Deposition of Abnormally Folded (β Pleated Sheet) ANP Derived Proteins and is confined to Cardiac Atria
- **Women in Hemochromatosis** – tend to not present until Menopause, since Menstruations will be like Phlebotomy. So After Menopause, the symptoms will kick in.
- **Neonates born to Hep B mothers** – are at High Risk of Chronic Disease, Fast HBV replication and Moderate Hepatic Injury
- **Mesothelioma** – associated with Asbestos Exposure, it will present with Long Microvilli and Abundant Tonofilaments, which will differ it from Bronchoalveolar type of Adenocarcinoma, which will present with Short Microvilli
- **To prevent Recurrent Seizures** – in patients with Status Epilepticus. First Line of Treatment is Addition of Phenytoin to Regular Benzodiazepine Therapy.
- **Corticosteroids** – are the Strongest and Most Predictable Effects in patients with Asthma
- **Nitrates** – mimic Action of Endothelial Derived Relaxing Factor, which will lead to Increased cGMP and Myosin Dephosphorylation, and Reduced Intracellular Calcium
- **Isosorbide Mononitrate** – is the most Bioavailable Oral Nitrate.
- **Loss of GABA Neurons in Striatum** – is characteristic of Huntington due to Increased CAG Repeats on Chromosome 4
- **Acute Acalculous Cholecystitis** – is an Acute Inflammation of Gallbladder without formation of Stones and it's mostly present in Hospitalized or Severely ill
- **Ethylene Glycol Ingestion** – will lead to Acute Renal Failure with Precipitation of Oxalate Stones, such as Calcium Oxalate Crystals in Urine
- **Partial Mole** – has a Triploid Karyotype, patient will present with Vaginal Bleeding and Lower Abdominal Pain

- **Tertiary Syphilis** – will present with **Neuro Involvement** and **Gummas**. That are **Necrotizing Granulomas** that appear on **Skin, Mucosa, Subcutaneous Tissue, Bones and Within Organs**. Similar to **Chancre** in **Primary Syphilis**
- **Watershed Areas** – are **Splenic Flexure** and **Distal Sigmoid Colon**, are **Most Susceptible to Ischemia** During **Hypotension** and **Low Perfusion States**
- **Splenic Hypertrophy in Pyruvate Kinase Deficiency** – is due to **Increased Work to Remove Deformed Erythrocytes from Circulation**
- **MacConkey Agar** – is used for **Many Enteric Bacteria**
- **Thayer Martin VCN** – is for **Neisseria Species** (**Vancomycin, Polymyxin and Nystatin** to remove all other bacteria)
- **Blood Agar** – are used to distinguish between **Enterococcal** and **NonEnterococcal Infections**. **Enterococcal** such as **E. Faecalis** and **E. Faecium** will grow in both **Bile Salts** and **6.5% Hypertonic Saline**. Where **NonEnterococcal (Strep. Bovis)** will grow in presence of **Bile Salts**, but **Not 6.5 % Solution**
- **Cysteine Tellurite Agar** – is for **Clostridium Diphtheria**
- **Bordet Gengou** – is for **Bordetella Pertussis**
- **Primary Billiary Cirrhosis** – is due to **Autoimmune Granulomatous Destruction of Hepatic Bile Ducts** and **Cholestasis**. **Side Effects** will include **Pruritis**, worse at **Night**.
- **Gonococcal Arthritis** – is a complication of **Neisseria Gonorrhea**, and must be suspected in **Sexually Active Young Adults**
- **Slow Acetylators** – are at **increased risk of Toxicity** to certain drugs, such as **Isoniazid, Dapsone, Hydralazine and Procainamide**
- **Imperforate Anus** in an **infant** – may also be associated with **abnormal development of Urorectal, Urovesical and Urovaginal Fistulas**
- **Chronic Rejection** – might produce **Chronic Obstructive Lung Disease** and cause **Bronchiolitis Obliterans**. **Pathology** includes **Lymphocytic Inflammation** and **Necrosis of Bronchiolar Walls**.
- **Acute Rejection** – will present with **Mononuclear Infiltration** on **Histological Examination**
- **Beck's Triad** – of **Hypotension, JVD** and **Distal or Muffled Heart Sounds** is indicative of **Tamponade**
- **Serine and Threonine Residue Phosphorylation** – by **Tyrosine Kinase** can lead to **Insulin Resistance**, and can be caused by **TNF- α , Catecholamines, Glucocorticoids and Glucagon**
- **Chronic Systemic Use of Steroids** – will **Promote Osteoporosis** and cause **Vertebral Fractures**, by **Inhibiting Vitamin D** and **Promoting PTH activity**
- **Anaplastic Tumors** – bear no resemblance to the **Tissue of Origin**
- **Lacunar Infarcts** – occur due to **Hypertensive Arteriolosclerosis** in **Basal Ganglia, Pons and Internal Capsule**

- **Hypertrophic Cardiomyopathy** – may involve a mutation in Beta Myosin Heavy Chain and Cardiac Cell Sarcomere Protein (Troponin, Tropomyosin)
- **External Branch of Superior Laryngeal Nerve** – is susceptible to injury in patients undergoing Thyroidectomy, this nerve innervates Cricothyroid Muscle, all other Muscles are innervated by Recurrent Laryngeal Nerve
- **Intracranial Schwannomas** – are usually located in Cerebropontine Angle, which is between Pons and Cerebellum
- **Octreotide** – Synthetic Analog of Somatostatin with a Long Half Life is used in Carcinoid Syndrome.
- **Intrapartum Antibiotics** – may be used to decrease Incidence of Group Beta Strep Meningitis in Newborns
- **Disruption of Macrophage Phagolysosomes** – in Patients with Silicosis, will make them susceptible to Infection with TB
- **Neural Tube Defects** – are associated with Increased Levels of Alpha Fetoprotein and Acetylcholinesterase
- **Seizures Side Effects** – are usually seen in therapy with Bupropion, Isoniazid and Imipenem
- **Tremor in patients** – may be treated with Anticholinergics, such as Benztropine, but must be avoided in patients with BPH and Closed Angle Glaucoma
- **Suspensory Ligament** – must be occluded during Surgery to Remove ovaries, to reduce the risk of accidental ligation of Ureters
- **Clonal T Cell Receptor Gene Rearrangement** – is seen in Malignant Lymphadenopathy
- **Adrenals** – are the Most Common Site of Metastases of Lung Cancers, other sites include Bone, Brain and contralateral Lung
- **Carotid Massage** – will Increase Firing of Baroreceptor Rate thus Increasing Parasympathetic Stimulation and thus Prolong AV Node Refractory Period
- **Crescent Formation** – in Light Microscopy is Diagnostic of RPGN, and there will be Accumulations of Fibrin, Monocytes and Macrophages
- **TNF- α Therapy** – is associated with Reactivation of Latent Tuberculosis. Thus PPD Screens are required before Initiating Therapy. Drugs include (Infliximab, Etanercept)
- **Envelope proteins gp41** – are Fusion Inhibitors that allow Virus to Fuse with Membrane. Drugs Enfuvirtide are useful to prevent this Fusion
- **Gp120** – is used for Viral Attachment to CD4 membrane on T cells
- **Apical Subpleural Blebs** – will be seen in patients with Spontaneous Pneumothorax
- **Mifepristone** – is Progesterone Antagonist and is Abortifacient, Misoprostol is Prostaglandin Analog, that will cause Uterine Contractions and is used in combination with Mifepristone
- **Disseminated Histoplasmosis** – is associated with Hepatosplenomegaly in Immunosuppressed Patients

- Pruritis – is usually a First Symptom of Primary Billiary Cirrhosis, where there are antibodies against Hepatic Bile Ducts and will cause Cholestasis
- Neisseria Meningitis – will proceed from Pharynx into Blood, then Choroid Plexus and then Meninges. Where H. Influenza will go from Pharynx to Lymphatics and then to Meninges
- Hyper IgM Syndrome – will present with inability of B Lymphocytes to Undergo Isotype Switching, and will present with Lymphoid Hyperplasia and Recurrent Sinus Infections. Most commonly it's due to absence of CD 40 Ligand on B Lymphocytes
- Fibromyalgia – usually affects women of 20-50 and presents with Diffuse Musculoskeletal Pain with pain in the Spine of Scapula, Lateral Epicondyle, Medial Fat Pad in the Knees and pain associated with Exercising
- Tamoxifen – in Breast Tissue is Anti Estrogenic Effect and Hyperestrogenic Effect in Endometrial Tissue, thus increasing the Risk of Endometrial Cancers, Polyps and Hyperplasia
- Patients on Levodopa – should not be taking Vitamin B6 Supplements due to Increase Metabolism of Levodopa caused by Vitamin B 6
- Hepatic Angiosarcoma - is associated with Exposure to Arsenic, Polyvinyl Chloride and will express CD 31 Tumor Markers
- Tuberoinfundibular Dopaminergic Pathway – is associated with connecting Hypothalamus to Pituitary and responsible for Dopamine Inhibition of Prolactin
- Sucrose – is a combination of Glucose and Fructose.
- Lactose – is Galactose and Glucose
- Maltose – is Glucose and Glucose
- Corneal Reflex – is associated with Nasocilliary Branch of V 1 Nerve. Motor Component is due to Facial Nerve Temporal Branch
- Conversion of Tyrosine to DOPA – requires enzyme Tyrosine Hydroxylase
- DOPA to Dopamine – Dopamine Decarboxylase
- Dopamine to Norepinephrine – Dopamine Beta Hydroxylase
- Norepinephrine to Epinephrine – require PNMT (Phenylethanolamine –N- MethylTransferase) and Cortisol Increases Transcription of this Enzyme
- Presence of Jejunal Ulcers – is Highly Indicative of Gastrinoma, there will also be Diarrhea and Abdominal Pain
- Respiratory Acidosis – will be seen in patients with Heroin Overdose. Bicarbonate Levels will be Low, because it will take 24 hours for Bicarb Levels to Compensate
- Sudden Standing or Valsalva Maneuvers – will increase Intensity of Murmurs in patients with Hypertrophic Cardiomyopathy
- IGF-1 of the Liver – is responsible for Growth Hormone Effect in Human Growth
- IGF -1 from Hypothalamus – is not Responsible for the Growth, but more for CNS Activity

- **Akathisia** – usually present as feeling on the Edge, Restlessness, Restless Leg Syndrome
- **Side Effects of Protease Inhibitors** – are usually associated with Hyperglycemia, Lipodystrophy (Buffalo Hump etc) and Inhibition of p450
- **Main Side Effect of Cholestyramine** – are GI Upset, Increased Triglyceridemia and Impaired Absorption of Nutrients and Drugs
- **End Stage Renal Disease** – will be associated with Osteitis Fibrosa Cystica, with Retention of Phosphorus, Loss of Calcium and Activation of 2ndary Hyperparathyroidism
- **Dense Pigment containing Epinephrine Metabolites** – is seen in the Lysosomes of the Liver in patients with Dubin Johnson Syndrome
- **Silicosis** – will present with Egg Shell Calcification of Lung Hilar Nodes and Birefringent Particles Surrounded by Collagen Fibers
- **Berilliosis** – may present with Non Caseating Granulomas
- **Hamartomas** – are the most common Benign Lung tumors composed of Collagen, Fibrous and Adipose Tissue
- **Small Cell Lung Carcinoma** – is usually associated with Neuroendocrine Markers and will present in the Center of the Lung usually in Smokers
- **ACE Inhibitors** – can cause an Increase in Creatinine and Decrease in Hydrostatic Pressure and Decreased Renal Perfusion
- **Acute Appendicitis** – is usually due to Obstruction of Lymph Flow of Fecalith. Bacterial Infection will be a pathogenesis of Obstructed Appendix.
- **Positive Kussmaul Sign** – will be seen in Patients with Chronic Constrictive Pericarditis.
- **Midsystolic Click** – is usually seen in Patients with Mitral Valve Prolapse
- **Immunocompromised Patients with >200 CD4 Count** – will have Strep. Pneumonia as a cause of their Lung Infections
- **Incidence of Squamous Cell Carcinoma** – and Esophageal Adenocarcinoma are now Equal
- **Smoking** – is the most Important Risk Factor for Pancreatic Cancer. Diabetes, Chronic Pancreatitis and Age >50 are Strong Risk Factors as well
- **Dating Error** – where the expectance Date was miscalculated, might be the most Important Reason for Increase in Alpha Fetoprotein
- **Digoxin** – will decrease AV Nodal Conduction, by Increasing Parasympathetic Tone of the Cardiac Muscle
- **Pancreatic Pseudocyst** – is a most common complication of Acute Pancreatitis, and is composed of Granulation Tissue and Fibrosis

- **Langerhan Cells** – present in Histiocytosis have a Tennis Racquet Shape Intracytoplasmic Granules and are called Birbeck Granules
- **JAK/STAT Signaling Pathway** – is used by Colony Stimulating Factors, Growth Hormones and Cytokines associated with Tyrosine Kinase Receptors
- **Cysteine** – becomes an Essential Amino Acid in patients with Homocystinuria, where there is a defect of Cystathionine Synthetase and accumulation of Methionine
- **Atherosclerotic Plaques with more 75% Occlusion** – are a cause of Stable Angina. Where plaques that occlude less than 75% of the Coronary Vessel will be Asymptomatic.
- **Ulcerated Plaque** – with partially obstructive thrombosis is associated with Unstable Angina or Subendocardial Infarction.
- **Ruptured Plaque** – is associated with Transmural Infarction with a Full Obstructive Thrombus
- **Friedrich's Ataxia** – is associated with Degeneration of Spinocerebellar Tracts, Kyphoscoliosis, Foot Abnormalities (High Arch), Hypertrophic Cardiomyopathy and Increased Risk of Diabetes Mellitus
- **Cleft Lip** – is associated with Impaired Fusion of Maxillary Prominence and Medial Nasal Processes
- **Cleft Palate** – is due to incomplete Fusion of Palatine Shelves of Maxillary Prominences
- **Spinal Scoliosis** – is usually seen in Marfan's Syndrome
- **Coccidioides Immitis** – presents as Flu Like Symptoms, Cough and Erythema Nodosum. Will Have Thick Walled Spherules with Endospores
- **Histoplasma Capsulatum** – will present with Pulmonary Symptoms similar to TB, and has Oval Yeast Within the Macrophages (found in caves, infested with bats)
- **Blastomycis** – Large Round Yeast with Broad Based Bud, presents with Pulmonary Pneumonia
- **Caspofungin** – which are Echinocandins, Inhibit Synthesis of Polysaccharide Glucan and used as Anti Fungal.
- **Wilson's Disease** – will affect degeneration of Putamen as well as Damage to Basal Ganglia.
- **MAP Kinase** – signal pathway includes RAS Protein which is a G Protein
- **Colon Adenocarcinoma in UC Patients** – will present in 30s and will be Uniformly Spread out. Unlike Sporadic, that arise in patients in 60s and more localized to the Left Side.
- **Carcinoid Syndrome** – when Localized to Intestine, it's products will be Metabolized by the Liver and Patients will not have Symptoms. When it's Metastasized to the Liver, then Secretory Products are Not Degraded and Patients Will Experience Symptoms.
- **Carcinoid Tumors** – arise from Chromaffin Cells of the Intestine, have Eosinophilic Cytoplasm and Oval Shaped Nuclei
- **4 Stages of Lobar Pneumonia** : 1) Congestion (first 24 hours) – Vascular Dilatation, Alveolar Exudate Contains Mostly Bacteria 2) Red Hepatization (2-3 Days) Alveolar Exudate – Erythrocytes, Neutrophils and Fibrin 3) Grey Hepatization (4-6 Days) No RBCs, mostly Neutrophils and Fibrin

- **Polyarteritis Nodosa** – will present with Fibrinoid Necrosis with Transmural Inflammation of Arterioles, fever, malaise, melena. Associated with Hep. B Infection
- **Alpha 1 Antitrypsin Deficiency** – presents with red-pink PAS Granules of Unsecreted A1AT in Periportal Hepatocytes
- **Hepatic Abscess** – will present with Fluid Filled Cavity in the Liver, usually due to Staph Aureus, due to Hematogenous Spread. Where Entamoeba Hystolytica will have Aerobic and Non Aerobic Bacteria containing Abscess
- **Hemosiderin Laden Macrophages** – are usually due to Elevated Pulmonary Pressure, secondary to Left Sided Heart Failure
- **Paraneoplastic Cerebellar Degeneration** – is an Autoimmune Process and presents with Limb and Truncal Ataxia, Dysarthria. Occurs in patients with Ovarian, Small Cell Carcinoma of the Lung, Breast and Uterine Cancers.
- **Space Constant** – how far along an axon signal will travel is Decreased in patients with Multiple Sclerosis
- **Class Switching for IgE** – is due to IL-4 and IL-13 produced by TH2 cells.
- **IL-5** – is responsible for Eosinophilia and Class Switching and Synthesis of IgA
- **Central Retinal Artery Occlusion** – presents with Painless, Permanent Monocular Blindness and will have Cherry Macula
- **Patients with Essential Fructosuria** – Metabolism of Fructose by Hexokinase to Fructose 6 Phosphate is primary method of Metabolizing Dietary Fructose
- **Carbamoyl Phosphate Synthase and N-Acetylglutamate Synthetase** – have increased levels of Ammonia and Neurological Defects.
- **Mycoplasma Pneumonia** – will require Cholesterol to grow on Artificial Media, due to Single Layer of Cholesterol Phospholipid Bilayer. They Completely Lack Peptidoglycan Cell Wall, Envelope or Capsule. Usually seen among Military Recruits
- **Optic Nerve Damage** – will cause neither pupil to react to Light, but when Light is shined into an opposite eye, both eyes will Constrict due to Intact Motor Function
- **Occlusion of Right Coronary Artery** – will result in Transmural Ischemia of Left Ventricle, producing ST Elevation in Leads II, III and avF
- **Occlusion of LAD** – will result in Anteroseptal Transmural Ischemia with ST Elevation in V1-V4
- **Occlusion of Left Circumflex** – will result in Transmural Ischemia of Lateral Wall of Left Ventricle and ST Elevation in V5 and V6
- **Combination of Statins and Fibrates** – increases the Risk of Myopathy and Hepatotoxicity
- **Combination of Fibrates and Bile Acid Resins** – will result in Increased Risk of Cholesterol Stones, due to Increased Cholesterol in Bile

- **Neuron Specific Enolase, Chromogranin** – along with Synapthophysin are Neuroendocrine Markers in Patients with Small Cell Carcinoma, which is located Centrally in Smokers.
- **Meniere's Disease** – characterized by Triad of Tinnitus, Vertigo and Sensorineural Hearing Loss. Due to Increased Pressure and Volume of Endolymph in Vestibular Apparatus
- **α 3 chain of Type IV Collagen** – is targeted by anti-glomerular basement membrane antibodies in Goodpasture's Syndrome
- **Drug Induced Nephritis** – due to NSAIDS will predominantly affect Interstitium, leaving Glomeruli Intact.
- **Beta Endorphin and ACTH** – are derived from the same Origin. Beta Endorphin has Increased Affinity to Delta and Mu Receptors.
- **Pulsion Diverticulitis** – is usually seen in Older Patients due to Increased Pressure, and will affect primarily Sigmoid Colon.
- **Li Fraumeni Syndrome** – Autosomal Dominant Syndrome, due to Mutation of p53 Gene and will cause Breast, Brain and Adrenal Cortex Sarcomas and Tumors mainly.
- **Niacin** – potentiates the effects of Anti Hypertensive Medications and Decrease the Effect of Diabetic Medications.
- **Eplerenone and Spironolactone** – are Aldosterone Antagonists are a usual Therapy for Conn's Syndrome
- **Portal Vein Thrombosis** – will present with Normal Liver, because the Defect is Distal to the Liver, will cause Portal Hypertension without affecting the Liver.
- **Pick's Disease** – is pronounced with Frontal Lobe Atrophy, and patients present with Dementia, Mood Disturbance and Speech Difficulties
- **Estrogen and Progesterone in Pregnancy** – Estrogen will cause Increased Cholesterol Synthesis by Upregulating HMG CoA Reductase and Progesterone will reduce Bile Acid Secretion and Slow Gallbladder Emptying
- **Muddy Brown Granular Casts** – are seen in Ischemic Tubular Necrosis in hospitalized patients.
- **Papillary Necrosis** – occurs in patients with Sick Cell, Diabetes Mellitus, Analgesic Nephropathy and Obstructive Pyelonephritis.
- **Hypersensitivity to Intradermal Injections of Tobacco** – are seen in Buerger's Disease, which is Thromboangitis Obliterans among Heavy Smokers.
- **Opening Snap** – is an abrupt Opening of Stenosed Mitral Valve.
- **Villous Adenomas** – are more likely to undergo Malignant Transformation, unlike Tubular Adenomas
- **Amifostine** – thiol based cytoprotective free radical scavenger used in patient on Cisplatin, to prevent nephrotoxicity.