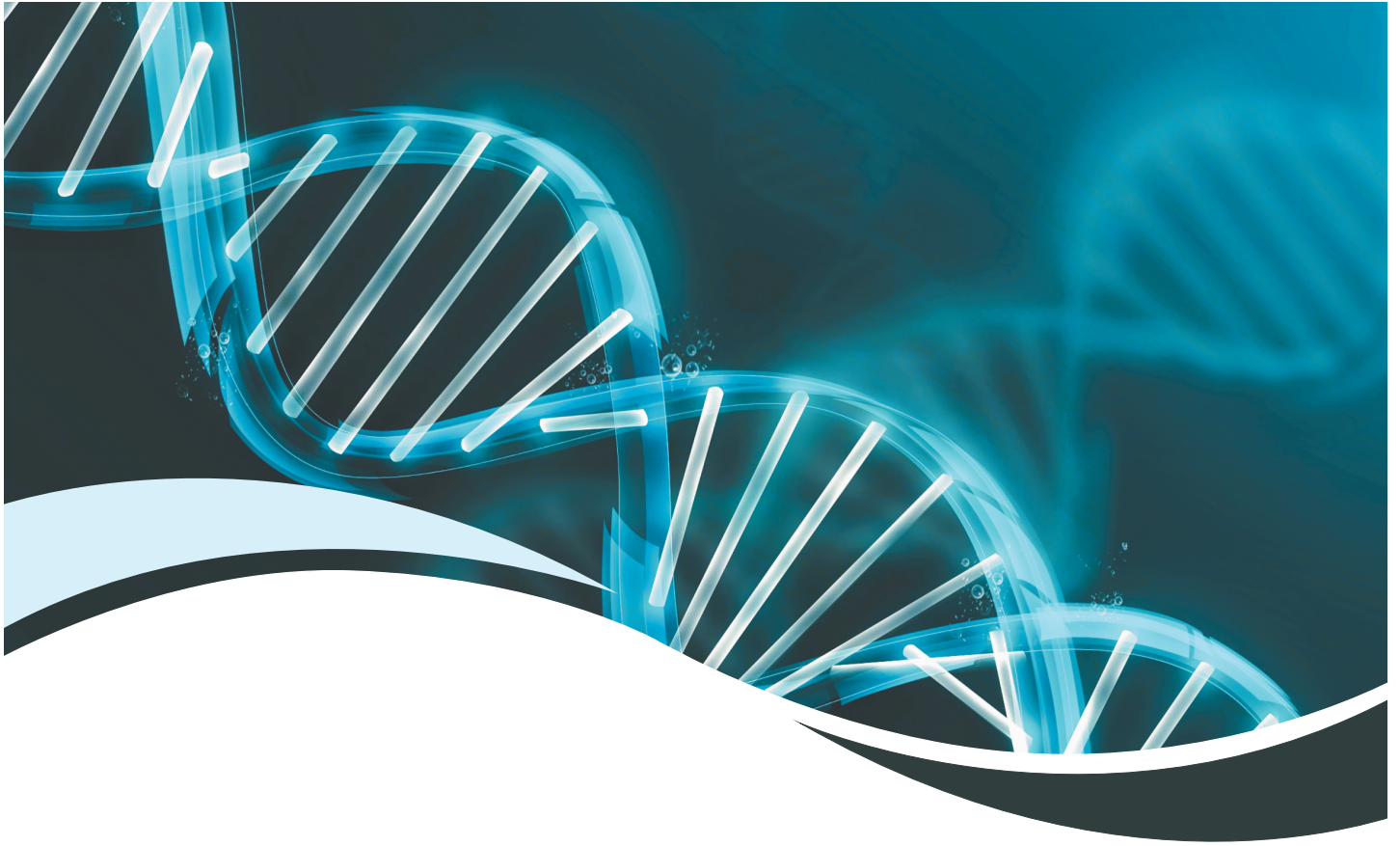




OneShot 4.0
Biochemistry



BIOCHEMISTRY

<i>Sl. No.</i>	<i>CHAPTER</i>	<i>Page No.</i>
1.	<i>How to Approach MCQ on Clinical Disorders</i>	3
2.	<i>Vitamins</i>	23
3.	<i>Minerals</i>	33

“

Success doesn't come from what you do occasionally; it comes from what you do consistently. Every small effort you make today is a step closer to your dreams. Stay focused, stay determined, and remember that while the journey may be tough, the reward will be worth it.

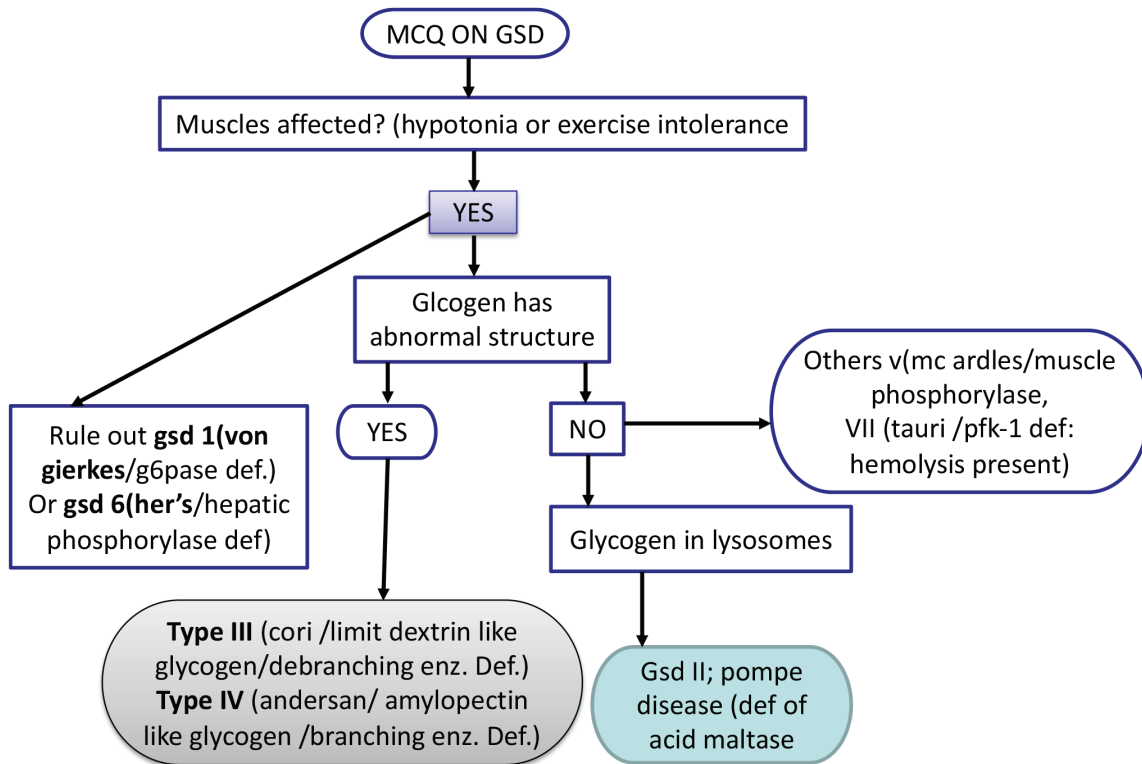
- Dr. Amit Jain

”



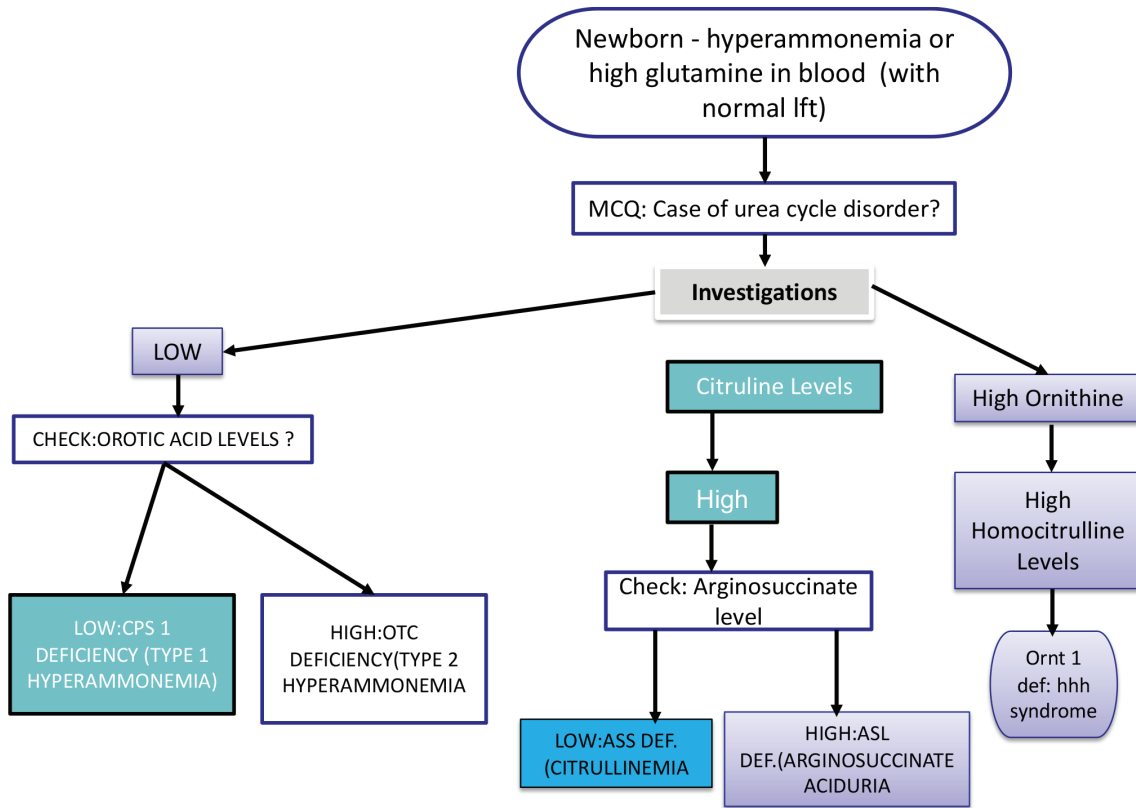
HOW TO APPROACH MCQ ON CLINICAL DISORDERS

Glycogen storage disorders



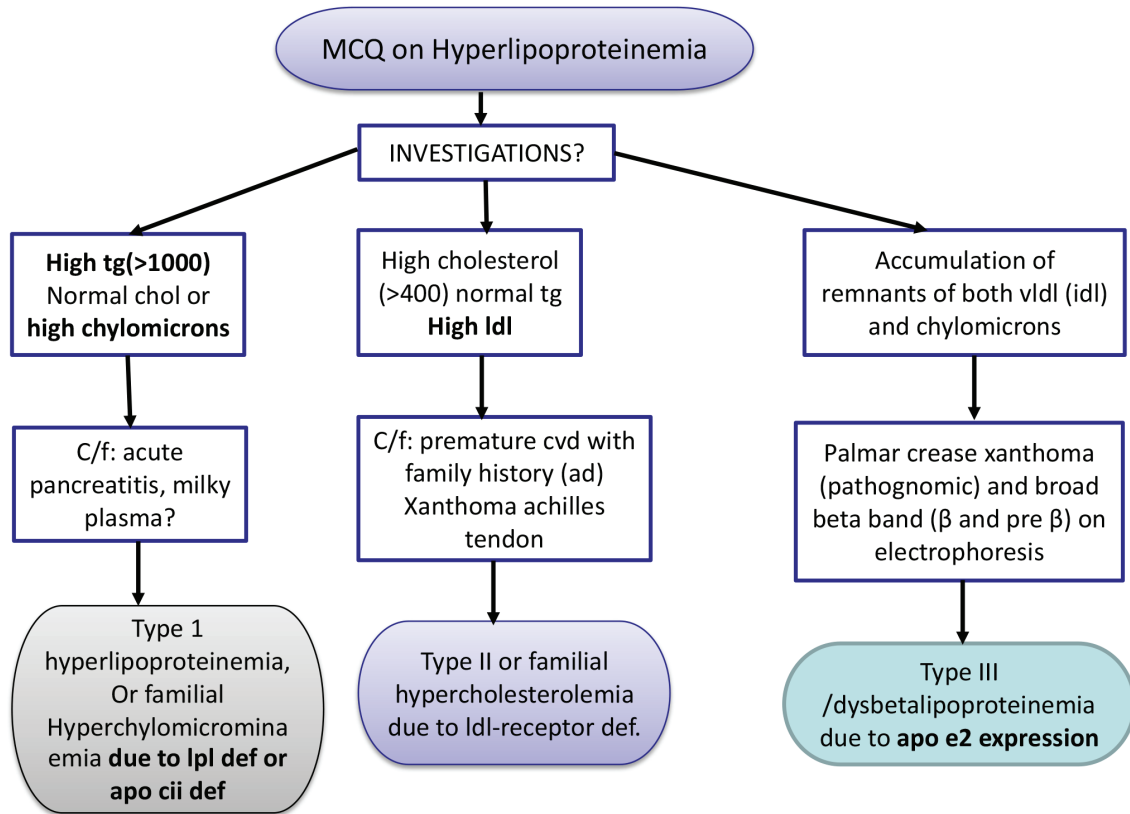


Urea cycle disorders





Hyperlipoproteinemia



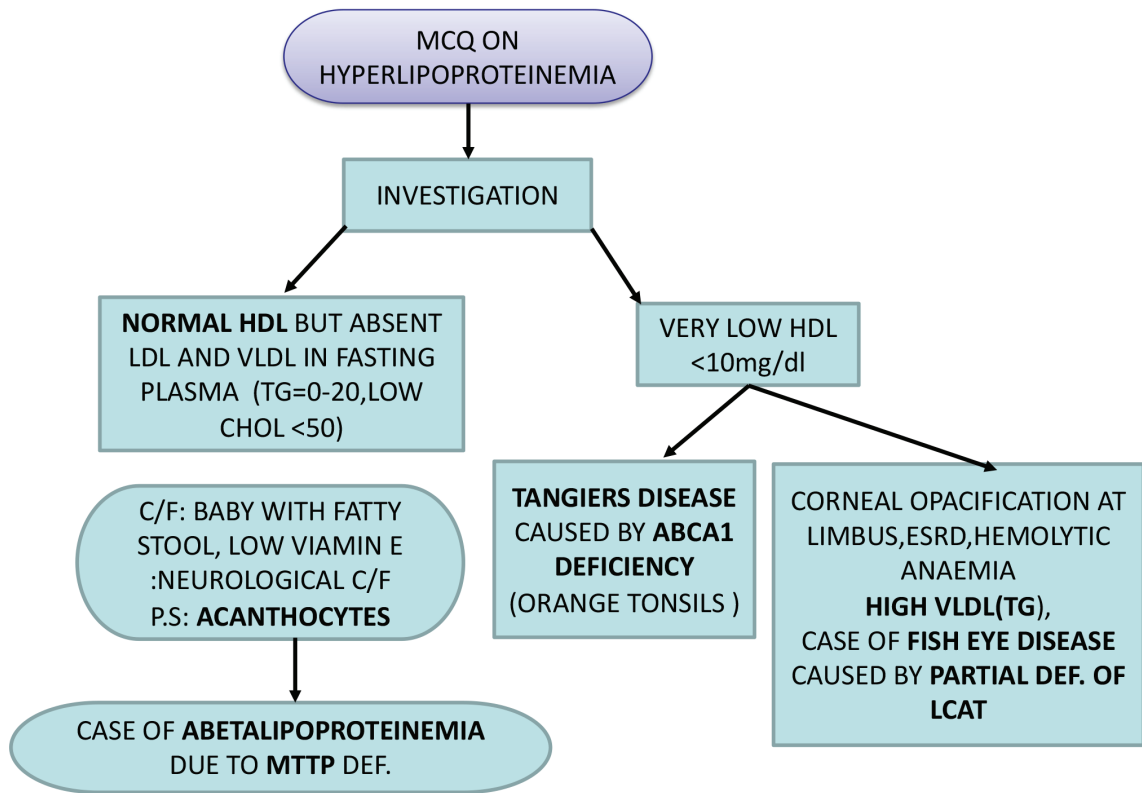
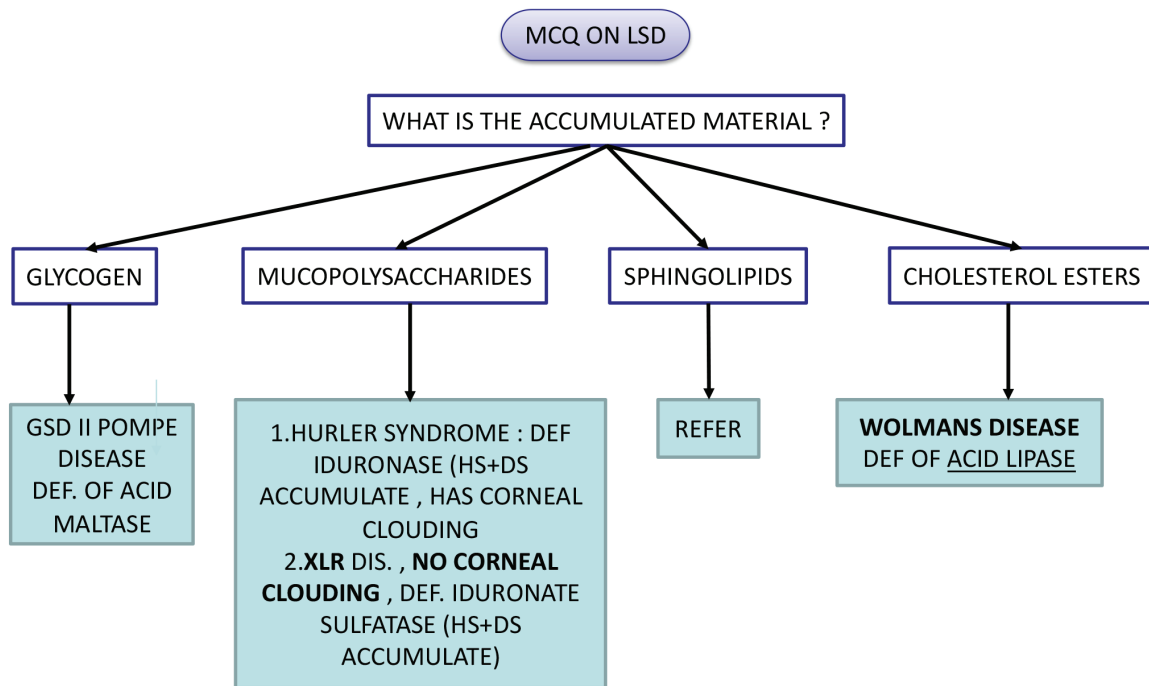


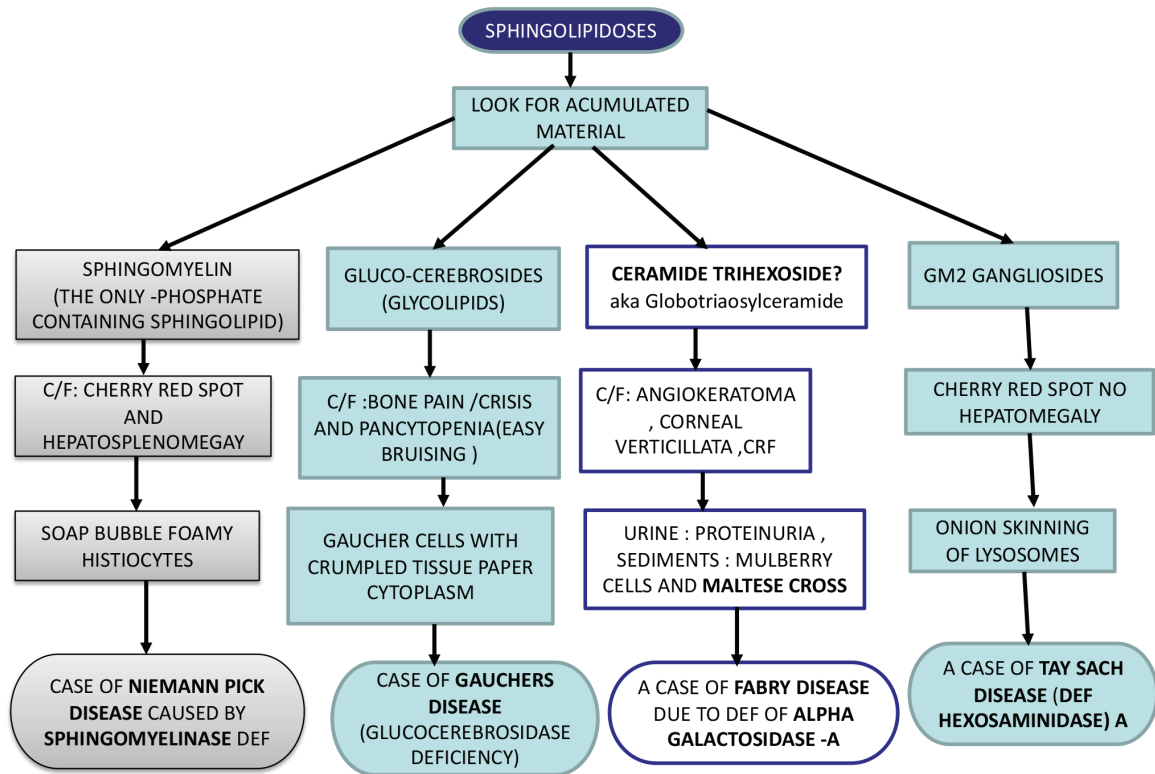


Figure 1: Bilateral Achilles Tendon Xanthomas



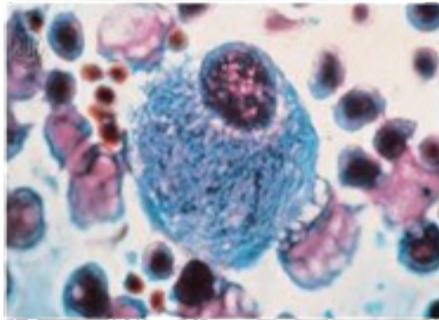




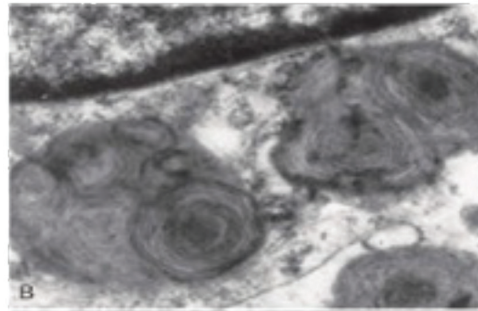




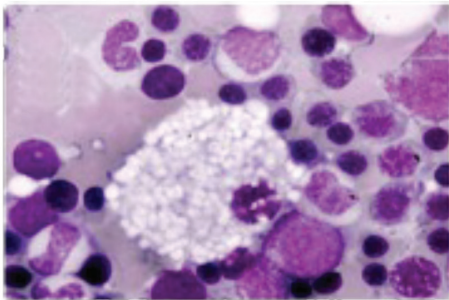
Gauchers disease : wrinkled or crumpled tissue paper appearance of histiocytes



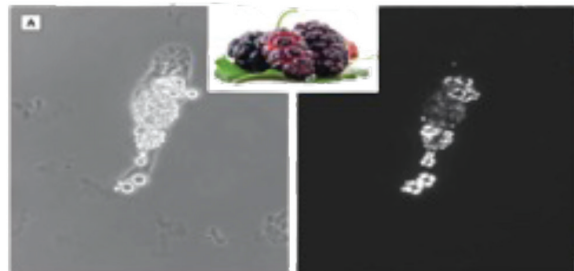
Tay sach disease: lysosomes with onion skin

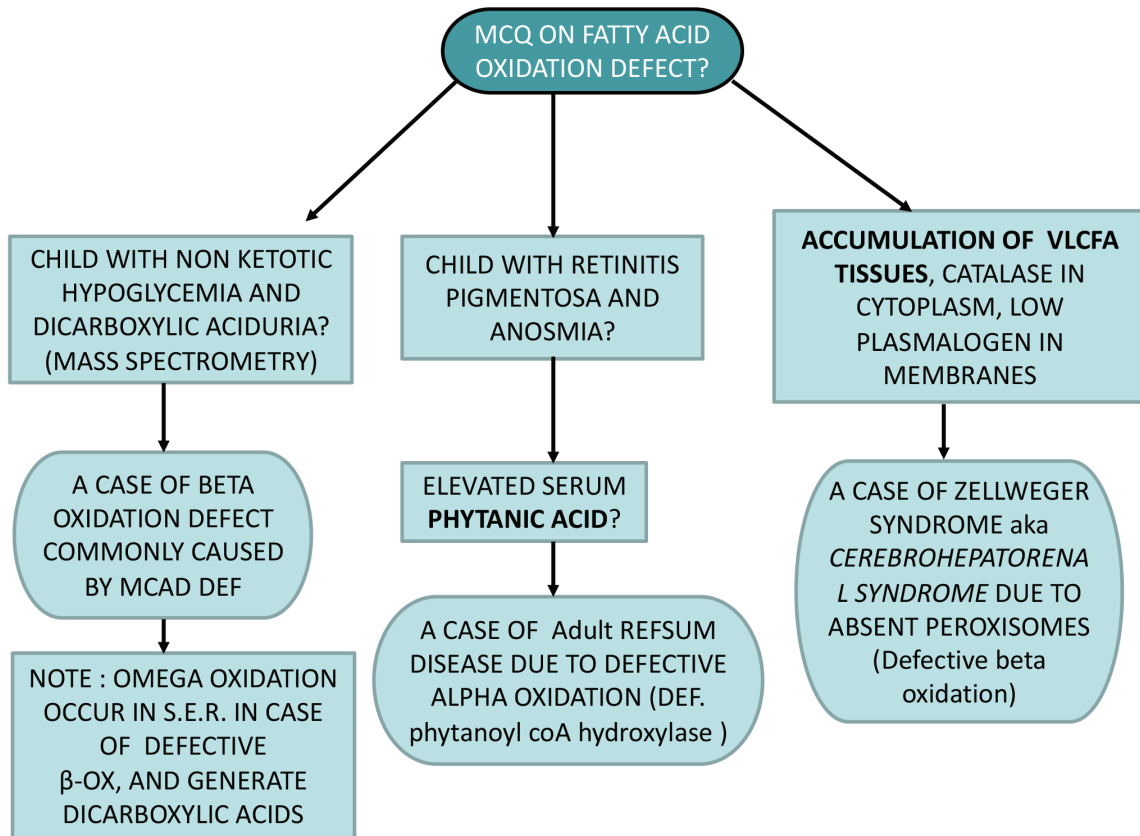


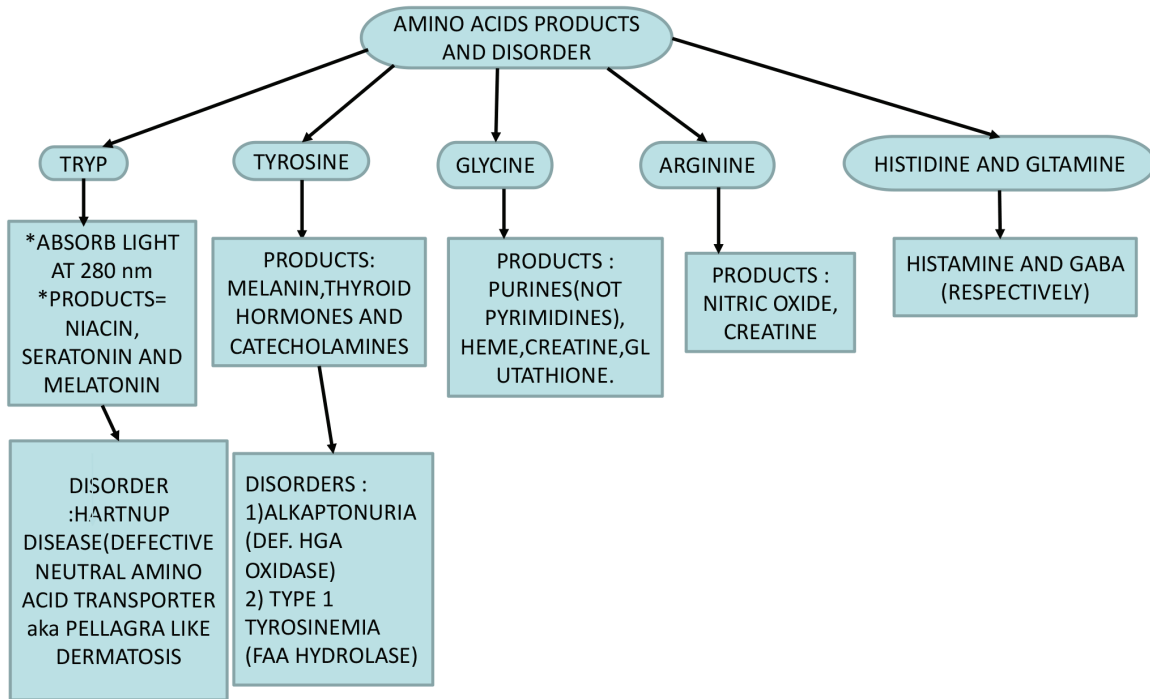
Niemann pick disease : Foamy histiocytes/ foam cell with bubbly appearance



Fabry disease: maltese cross and mulberry cell in urine: a tell tale sign









Name the Porphyria presenting with ?

- *Acute symptoms but no sun sensitivity =*
- *Acute C/F and sun sensitivity =*
- *Erythrodontia and severe sun sensitivity =*

**Quick formula for numericals based Q (enzymes /total cholesterol)**

- Michaelis menton equation $V = \frac{V_{max} \times S}{K_m + S}$
- Enzyme efficiency = $\frac{K_{cat}}{K_m}$
- Friedwalds formula : $LDL = Total\ chol - (HDL + \frac{TG}{5})$

Metabolic Inhibitors as MCQ

	Inhibitor	Enzyme
1	Iodoacetate	G3PD (glycolysis)
2	Fluoride	Enolase (glycolysis)
3	Arsenic	PDH complex, alpha KGDH (TCA) Uncoupler of SLP by PGKinase (glycolysis)
4	Lead	ALA dehydratase, ferrochelatase (heme synthesis)
5	Flouroacetate	Aconitase (TCA)
6	Malonate and carboxin	Succinase dehydrogenase (TCA / complex II ETC)
7	Ricin	28S rRNA (peptidyl transferase)
8	Alpha amnatin	RNA polymerase II
9	ETC complexes I	Rotenone
10	II	Malonate, carboxin
11	III	Dimeric paralol (BAL), Antimyc in
12	IV	CN, CO, H2S, azide
13	ATP ADP TRANSCLOC ASE	Atractyloside
14	UNCOUPLERS of oxidative phosphorylation	Dinitrophenol, (thyroid hormones, Long Chain fatty acid and UCP-1 are physiological uncouplers)
15	ATP synthase	Oligomycin

Obligate Allosteric Activators	Enzyme
Acetyl coenzyme A	Pyruvate carboxylase (gluconeogenesis)
N-acetylglutamate	CPS-I (urea cycle)

Non vitamin coenzyme	Enzyme
BH ₄	NO SYNTHASE, HYDROXYLASE OF TRYPTOPHAN, PHE
SAM	SERATONIN → MELATONIN, NE → EPINEPHRINE, CREATINE SYNTH
THIOREDOXIN	Ribonucleotide diphosphate reductase reductase
Heme	Cytochromes

ATP produced	ATP USED
Glycolysis = 7	Glyconeogenesis = 6
Acetyl coenzyme A (TCA) = 10	Urea cycle = 4
Beta oxidation (of 16C saturated fatty acid palmitic acid) = 106	



Atp synthase : β subunit is catalytic





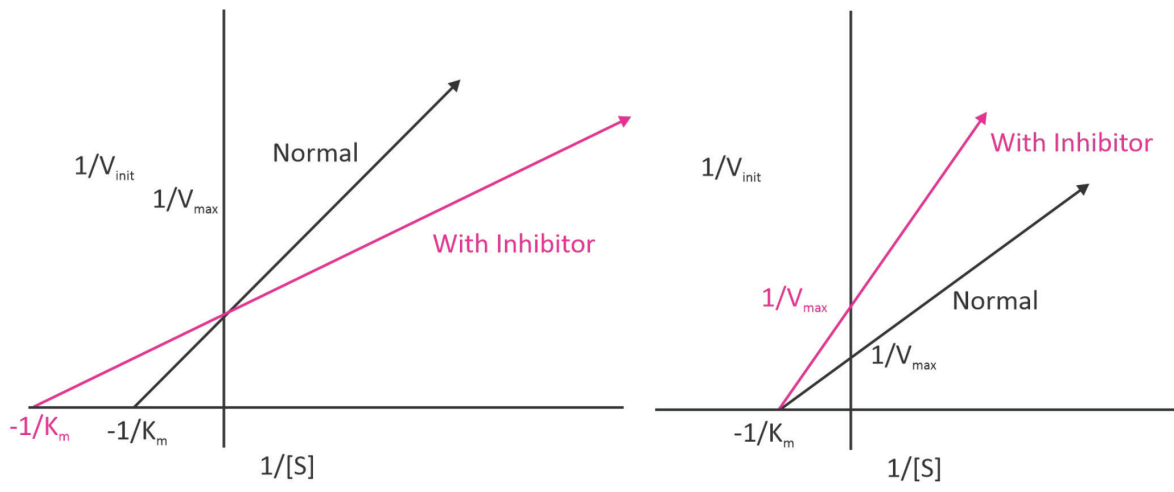
All biochemistry test (LFT, KFT, hormones, lipids, drugs, amino acids : serum sample (plain vial)

Plasma glucose : grey vial





Enzyme Inhibitors





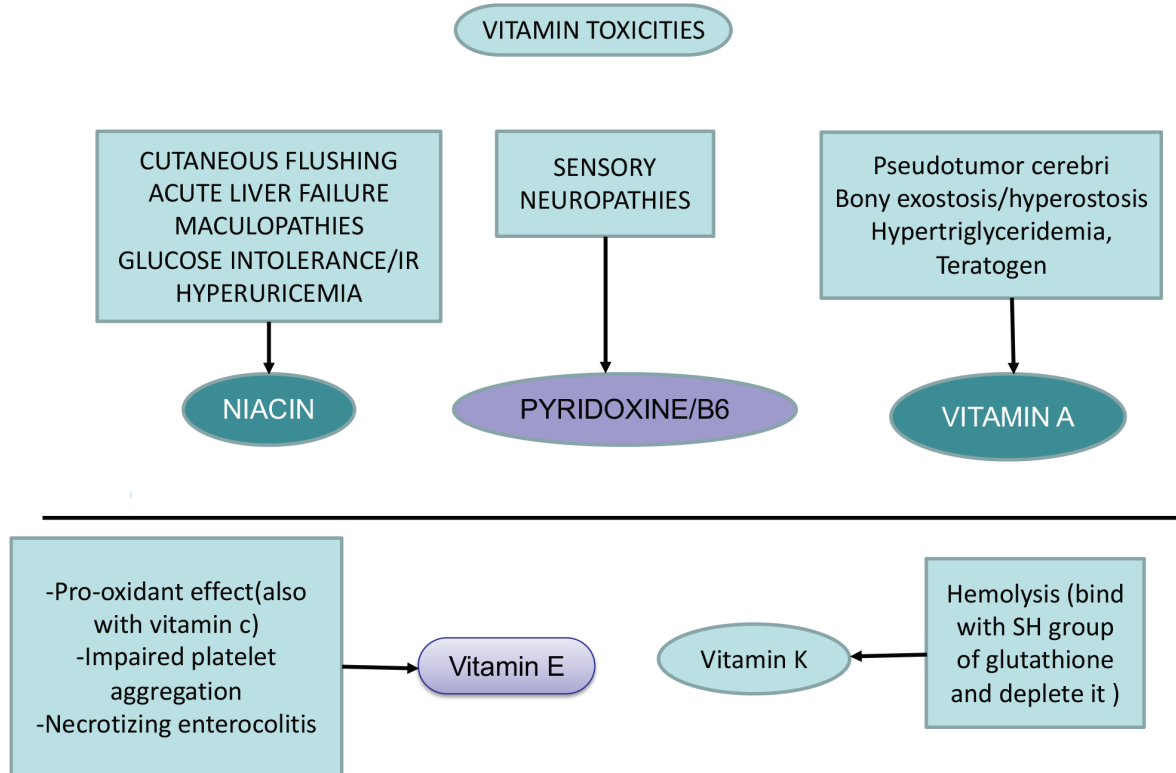
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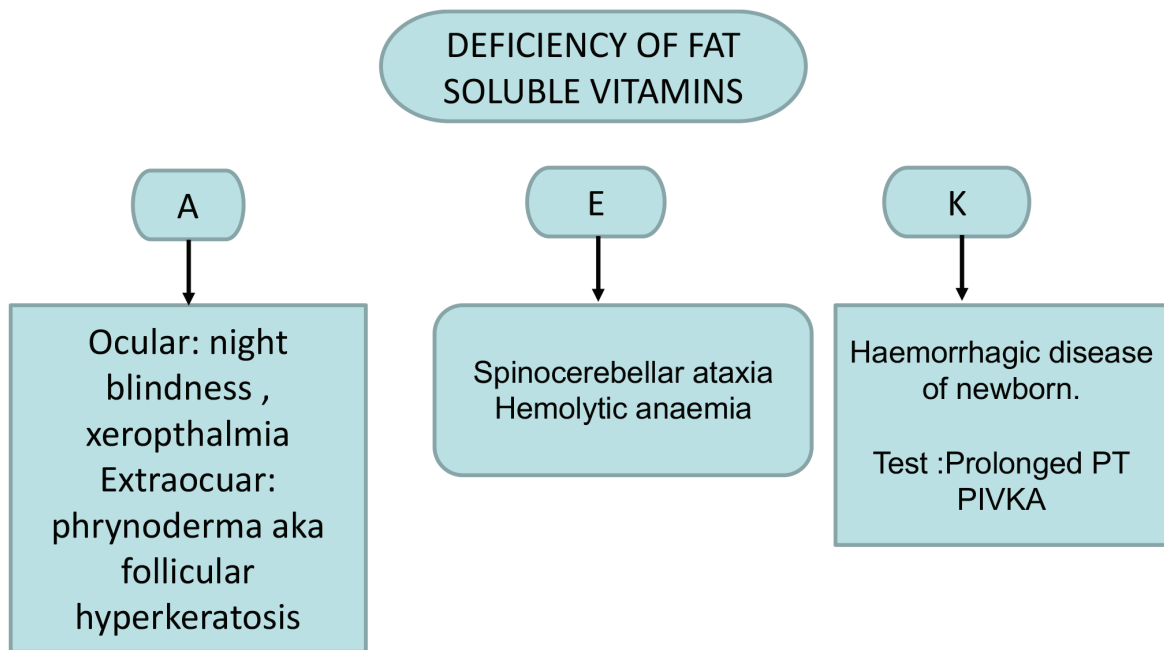


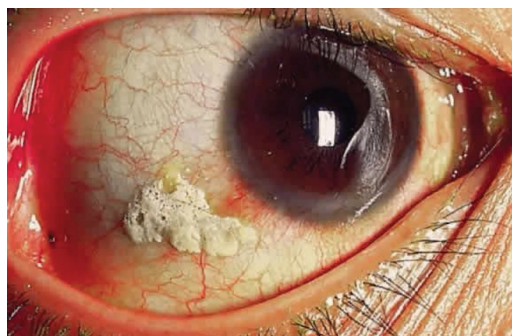
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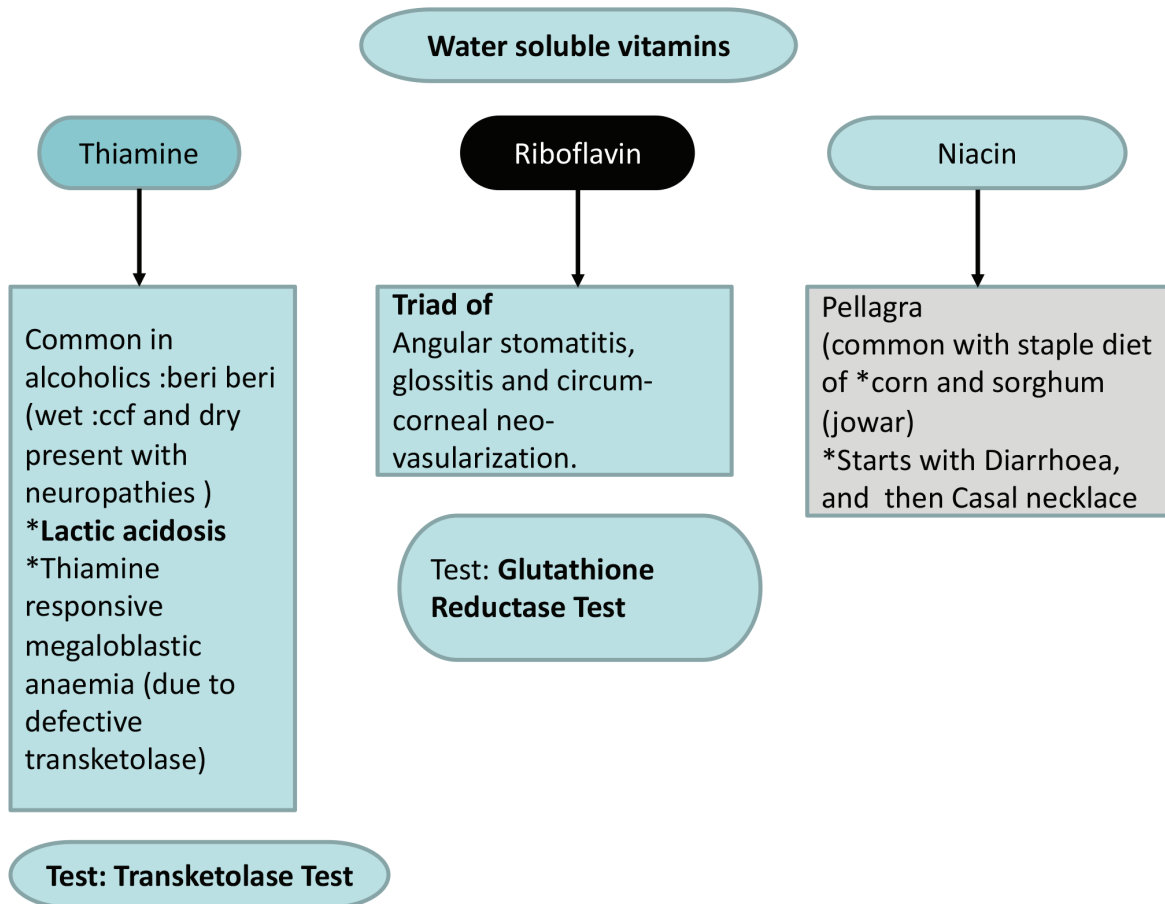


VITAMINS



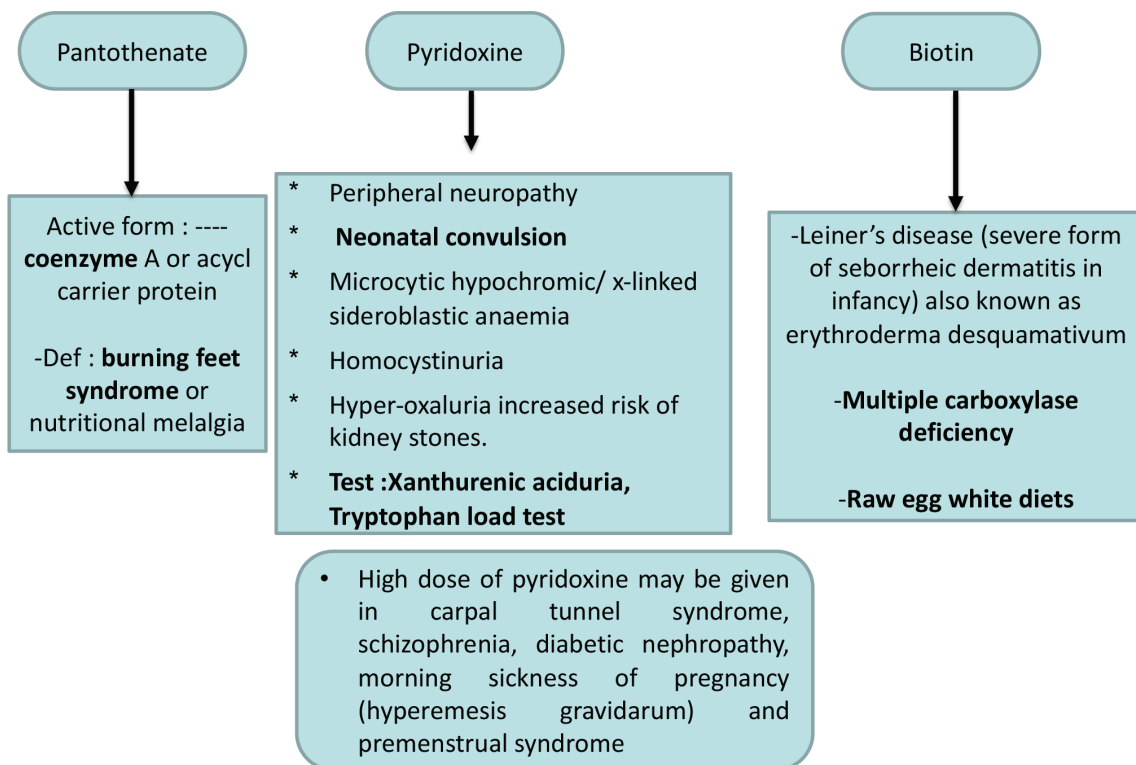




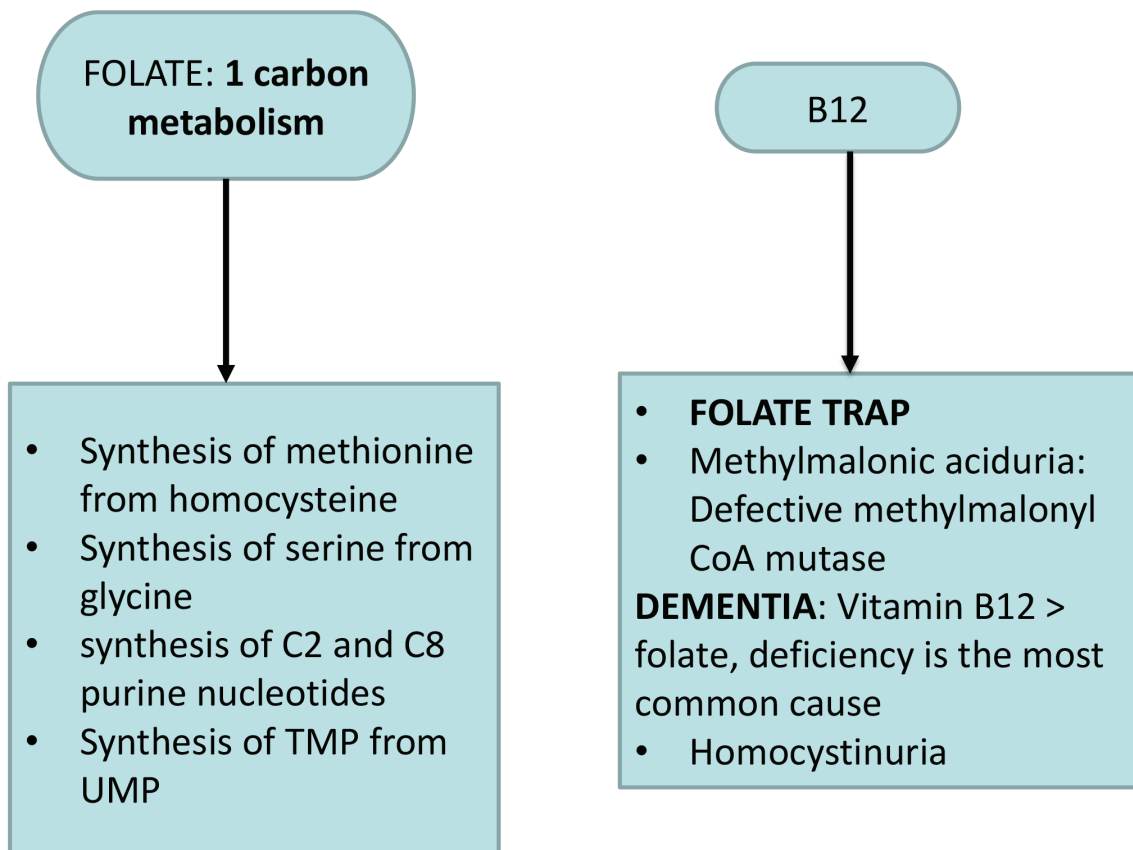






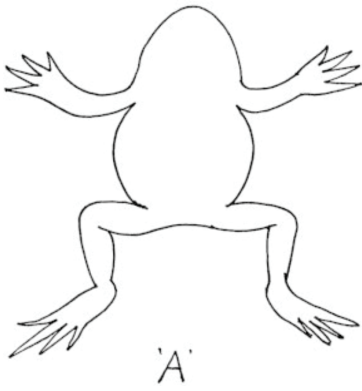








Vitamin C





MINERALS

1. Copper

Enzymes :

1. *Cytochrome oxidase*
2. *Tyrosinase*
3. *Dopamine beta hydroxylase*
4. *Lysyl oxidase*

Deficiency : Menke disease due to *ATP 7A* defects in intestine





2. Zinc

Enzymes :

1. *Alcohol dehydrogenase*
2. *Carbonic anhydrase*
3. *Alkaline phosphatase*

Zinc as mineral :

1. *Important for insulin structure*
2. *Part of Zinc fingers (steroid receptors)*
3. *Deficiency*
 - a. *Hypogonadism*
 - b. *Acrodermatitis enteropathica*
 - c. *Hypogeusia*



Acrodermatitis Enteropathica on 15 month old female characterised by periorificial and acral dermatitis and alopecia. There are annular, well demarcated, erythematous, crusted plaques and vesicles distributed symmetrically around orifices and hands.

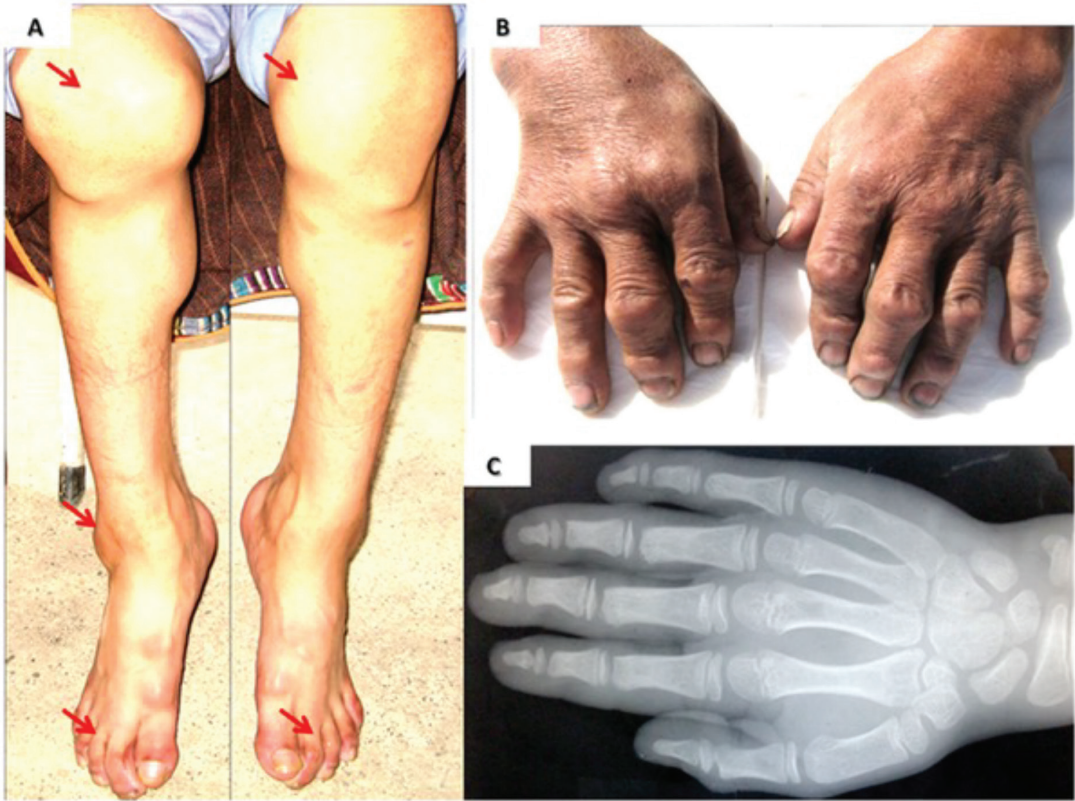


3. Selenium

Enzymes :

1. *Glutathione peroxidase*
2. *Deiodinase*
3. *Thioredoxin reductase*

Deficiency : *Keshan disease (cardiomyopathy) and Kashinbecks disease (osteoarthropathy caused by selenium and iodine deficiency)*





NOTES



NOTES