

Systemic Disorders

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What is a systemic disorder?

One that affects a number of organ systems and tissues, or affects the body as a whole, involving pathological changes on a cellular level.

E.g cardio-vascular, hepatic, renal, immune, endocrine, neurological, haematological, dermatological.

Commonly-occurring systemic pathologies that you may encounter include:

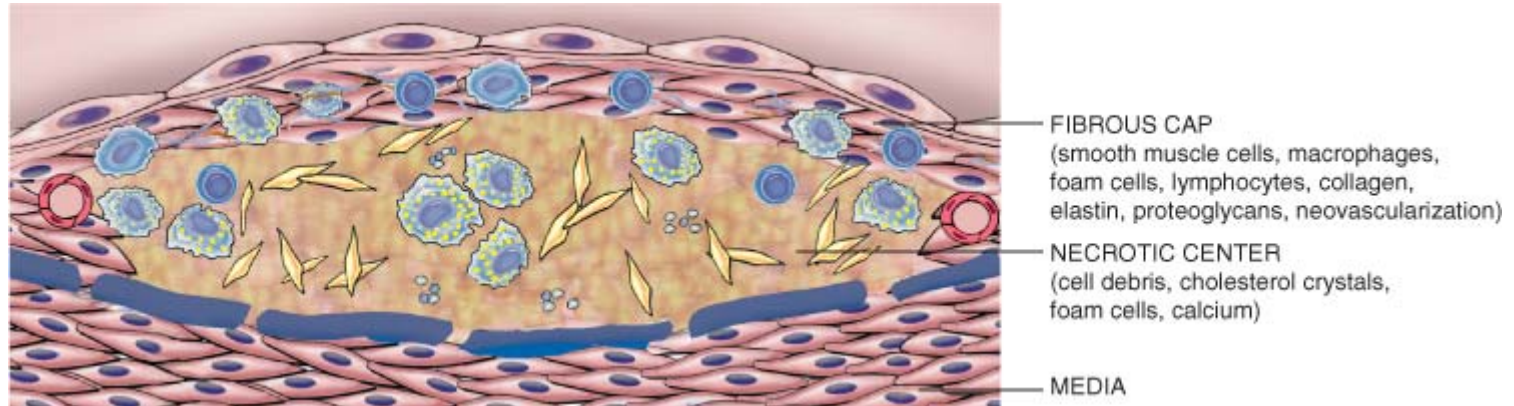
Diabetes mellitus

Rheumatoid arthritis

Cardio-vascular disease

Hepatic cirrhosis

1. Atheroma



atheroma (plural: atheromata) is an abnormal accumulation of inflammatory cells (macrophages, WBCs), lipids, and a variable amount of connective tissue within the walls of arteries.

Can begin as young as 1 year of age, and appears in ALL children over 10 years of age.

Why is it a problem?

It leads to the narrowing of the vessel, and therefore interferes with the flow, and dynamics of flow.

Consequences:

MI, CVA, ischaemia, angina, occlusion, thrombosis, embolism, and many more.....

Who does it affect ?

Most patients have underlying atherosclerosis.

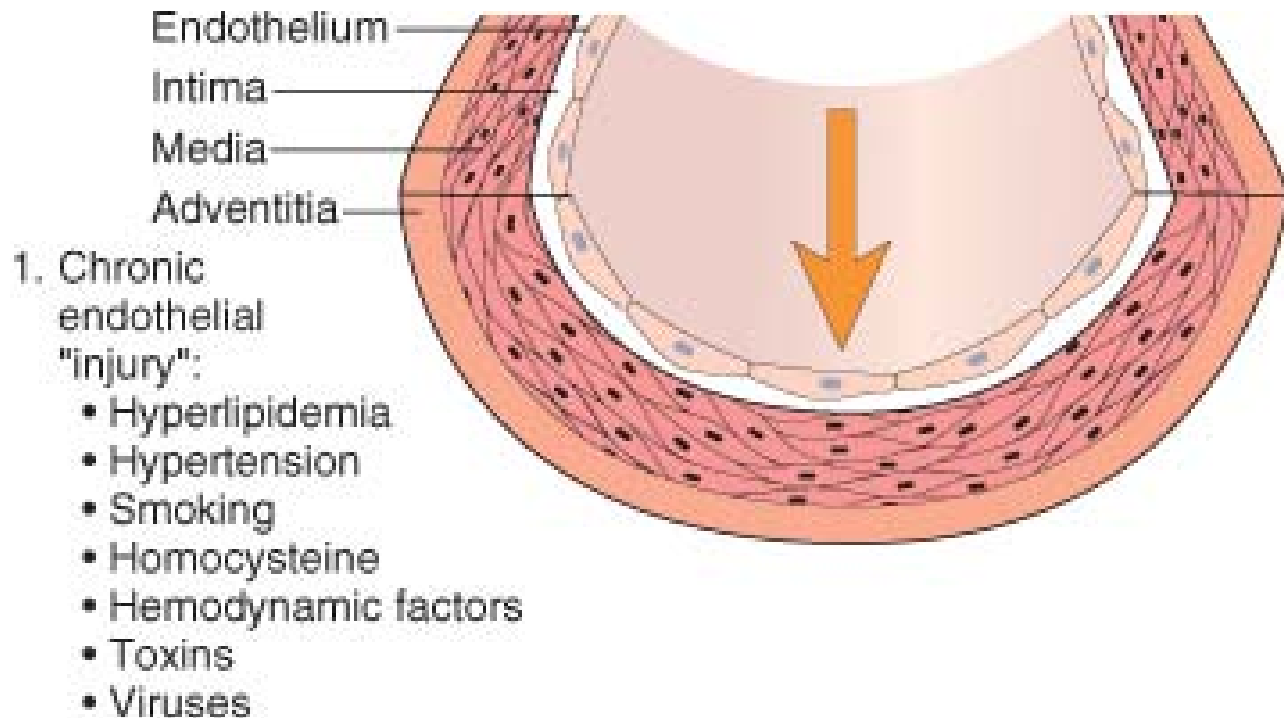
Major risk factors include hypertension, elevated levels of low-density lipoprotein, reduced levels of high-density lipoprotein, cigarette smoking, diabetes mellitus, obesity, male sex, elevated homocysteine levels.



"Would you like a bypass with that?"

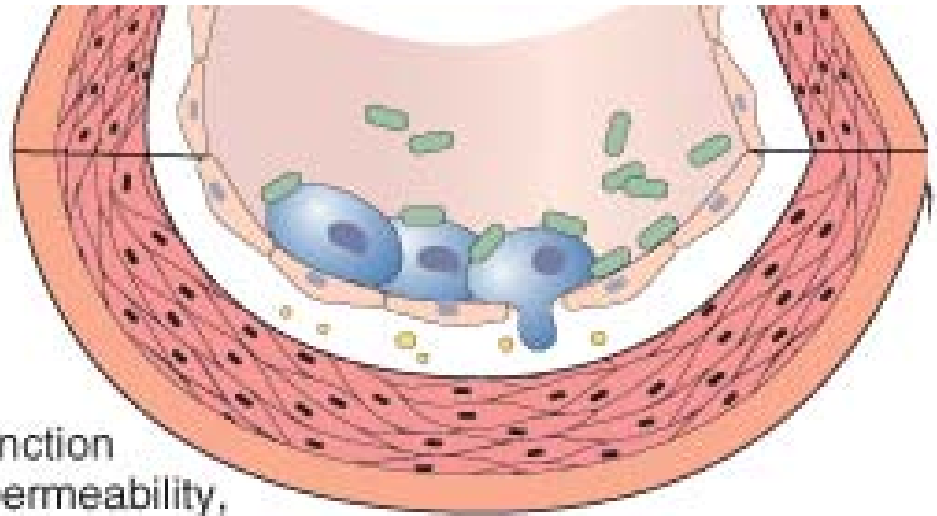
How does it develop ?

Stage 1- chronic endothelial injury



Stage 2.

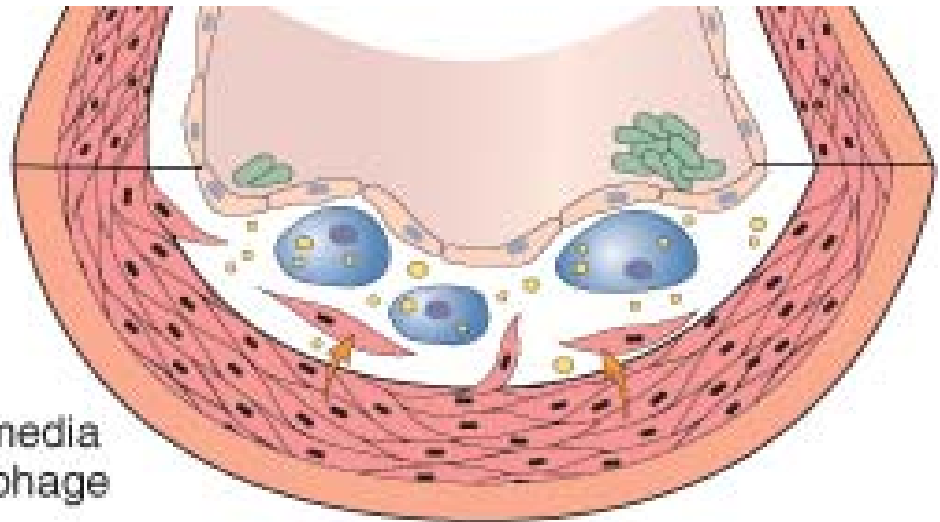
Endothelial dysfunction, allowing
adhesion and invasion



2. Endothelial dysfunction
(e.g., increased permeability,
leukocyte adhesion)
Monocyte adhesion
and emigration.

Stage 3

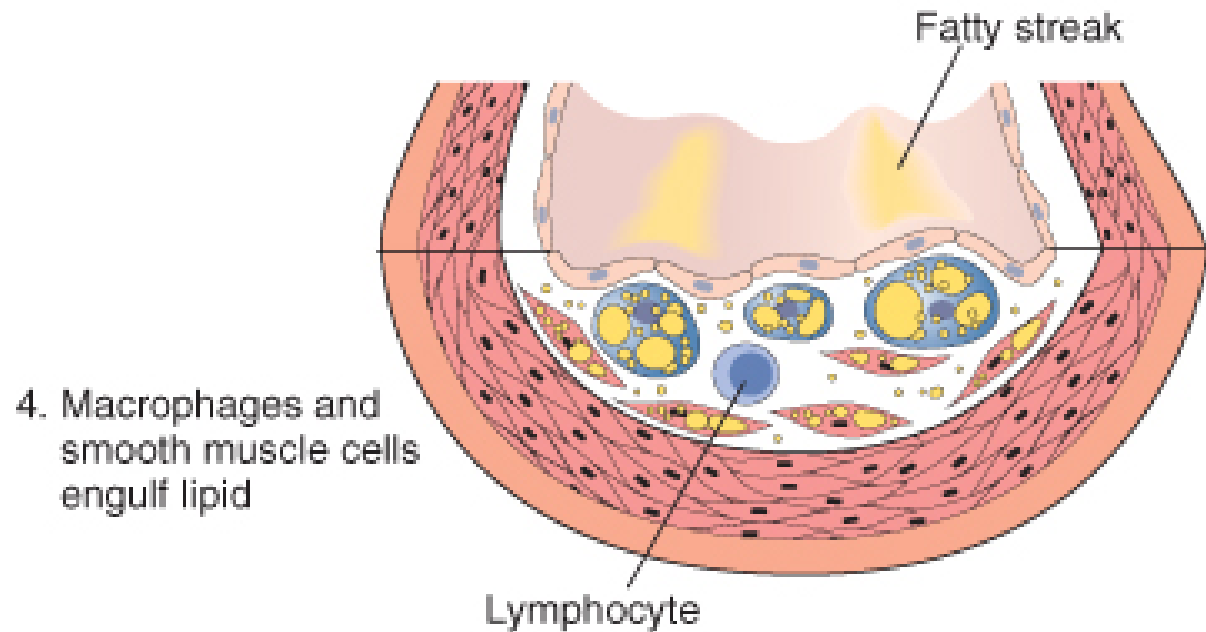
Smooth muscle begins to emigrate,
macrophage activity.



3. Smooth muscle emigration from media to intima. Macrophage activation.

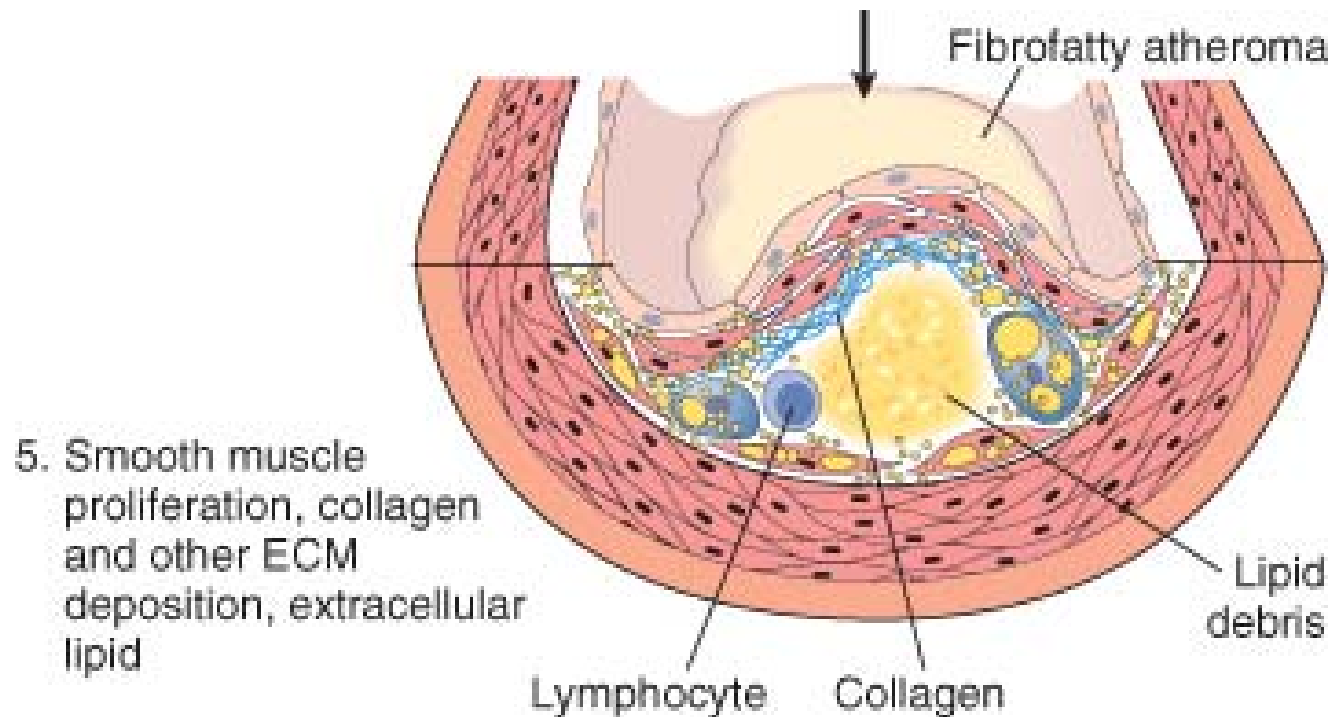
Stage 4.

Engulfment of lipid material into artery wall,
development of 'fatty streak'.



Stage 5.

Smooth muscle proliferates, extra collagen laid down, lipid debris, narrowing of lumen.



Signs & Symptoms

Acute Occlusion

Sudden onset of
pain

Coldness

Numbness

Pallor

Absent pulses

Chronic Occlusion

Insidious onset of
ischaemia

Intermittent
claudication

Night cramps

Potential consequences in the limb



Management of atheroma

- Stop smoking
- Increase exercise (gently!)
- ? Vasodilators
- Percutaneous transluminal angioplasty
- Grafting, bypass
- Thrombolytic therapy
- Growth factor therapy

In which disorders do we commonly see atheroma?

- DM
- Hypertension
- Coronary heart disease
- Cerebral vascular disease
- Peripheral vascular disease

2. Neuropathy

Loss of function of neurons, involving sensory, motor, and autonomic divisions.

Can involve large fibres, small fibres, or be classified as idiopathic.

May be due to many different factors - e.g. glucose levels, demyelination, trauma, compression, ischaemia.

Glucose levels

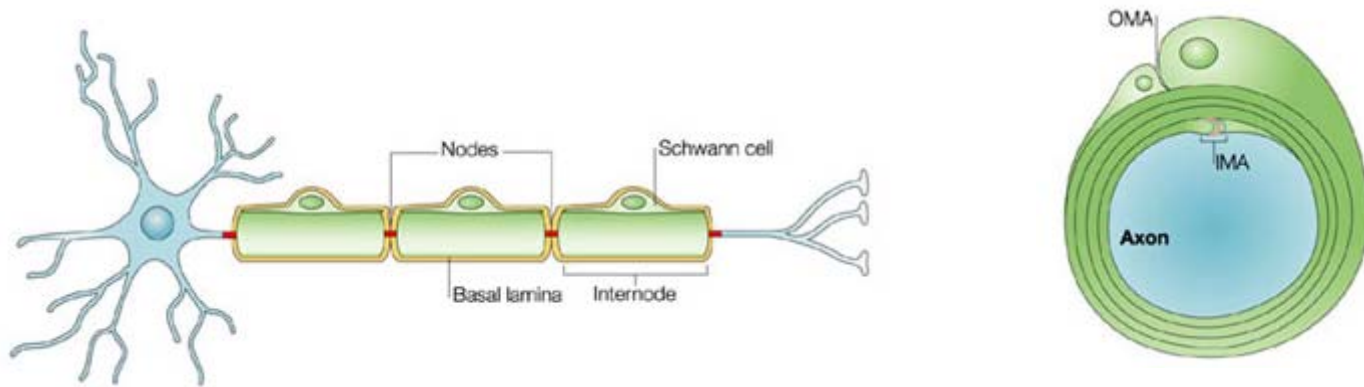
Increased activity in the polyol pathway leading to structural cell damage.

Nerve cells have no insulin receptors

Ischaemia - no blood supply = no oxygen or nutrients !

Demyelination

Neurons are surrounded by a layer of myelin which acts as an electrical insulator



Loss of myelin will affect conductance of action potentials, and therefore impair nerve function

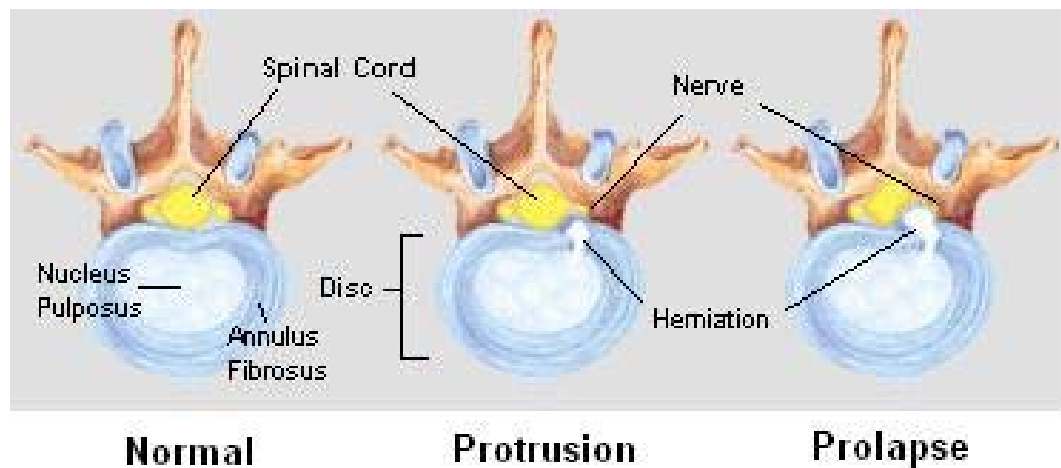
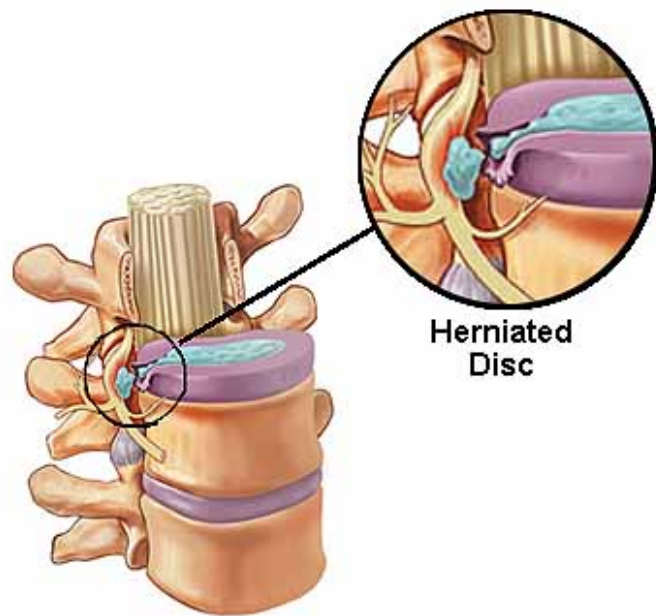
Causes of demyelination

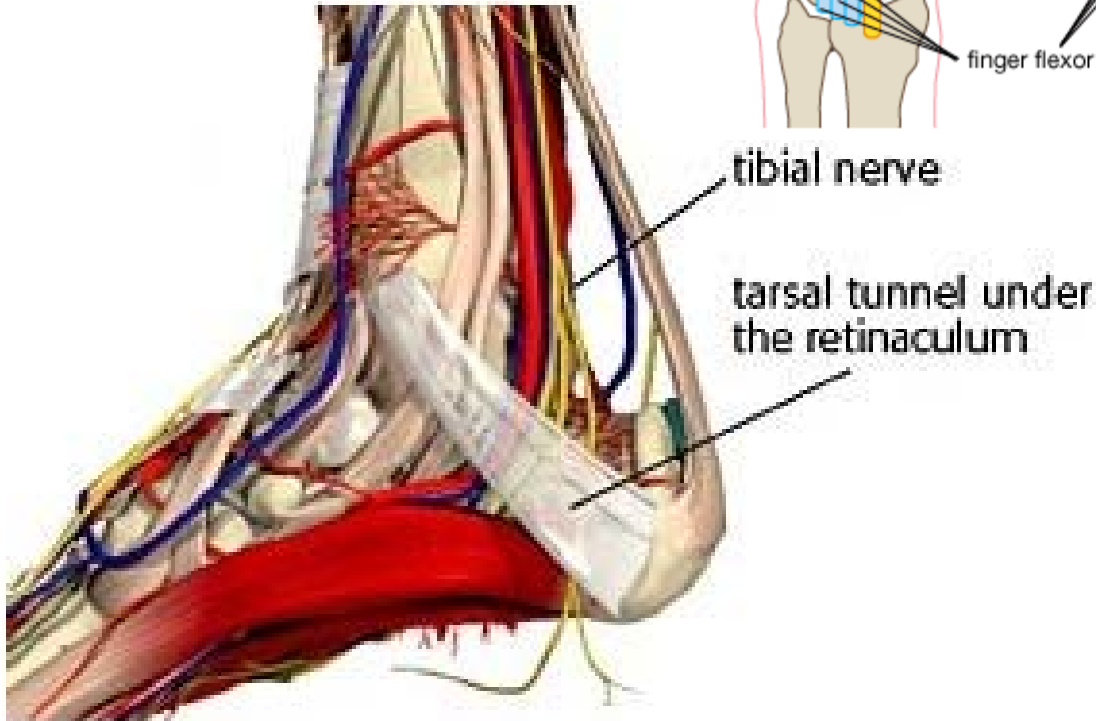
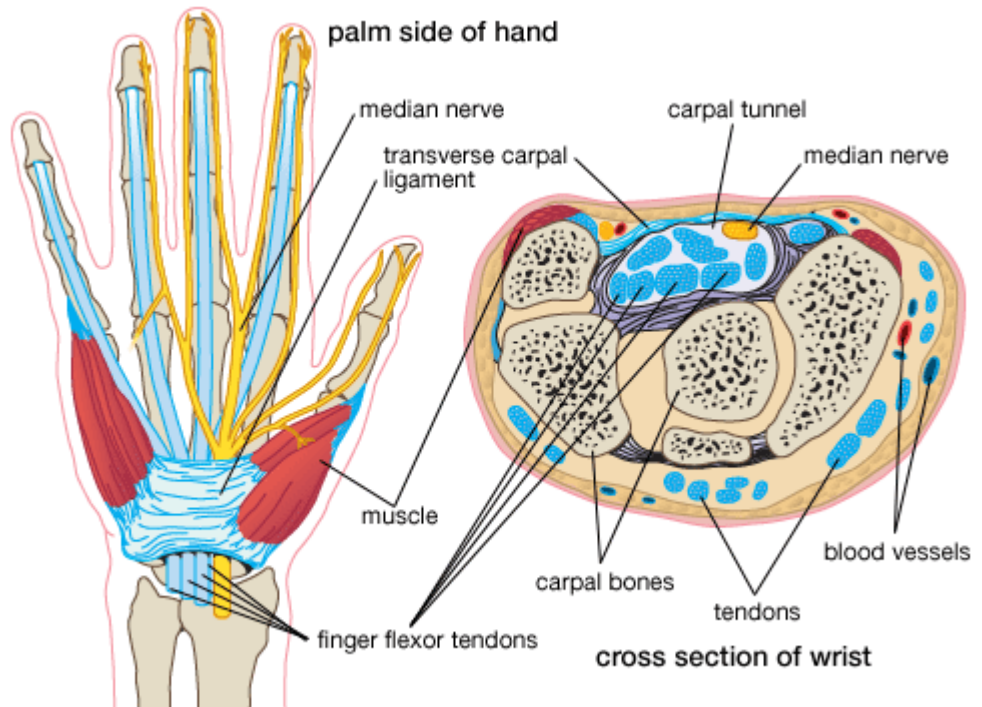
- Pernicious anaemia
- Autoimmune damage - RA, ?MS
- Lack of thiamine - Beriberi,
Wernicke-Korsakoff syndrome

Compression / trauma

Compression on either the spinal cord, or on individual spinal nerves, leads to loss of motor, sensory, or autonomic function.

Can via disease process, eg RA in cervical vertebrae, degenerative, eg, prolapsed disc, or traumatic, eg, injury.





Carpal tunnel

Tarsal tunnel

3. Immunosuppression

A reduction in the efficiency of the immune system.

May be:

purposely induced (transplant therapy)

drug-induced (steroid therapy)

pathological (auto-immune disorders)

Consequences

Primary cancers - cerebral lymphomas, Kaposi's sarcoma, viral carcinomas

Secondary cancers - leukaemias, non-Hodgkins lymphoma, lung, skin, breast, pancreatic

Susceptible to bacterial infection - respiratory in particular

Delayed and deficient healing



In summary

Systemic disorders affect all organ systems and tissues, involving pathological change.

There are certain changes which are common to many disorders, and explain many of the clinical presentations we see.

Don't try and learn everything - that's what text books and the internet are for (amongst other things!)

kitteh helps with online dating

loser...
loser...
dog luvr...
loser...

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