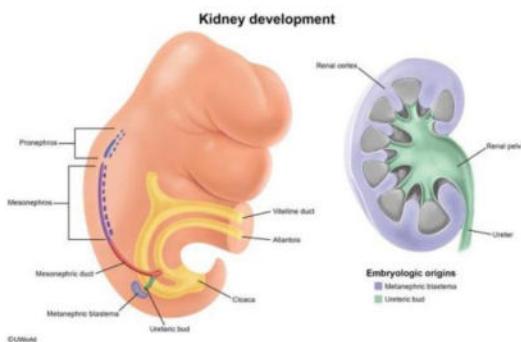


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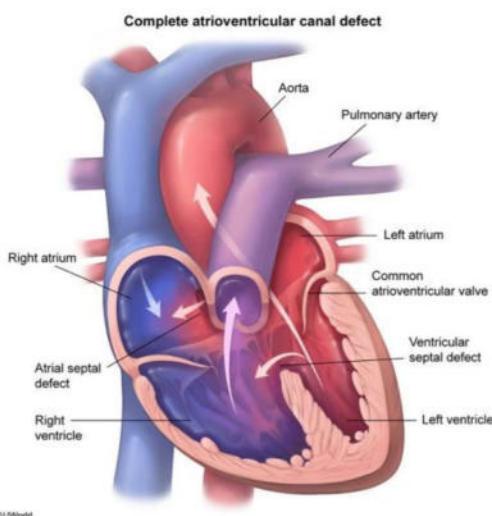
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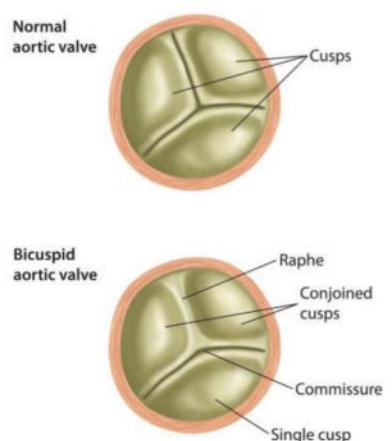


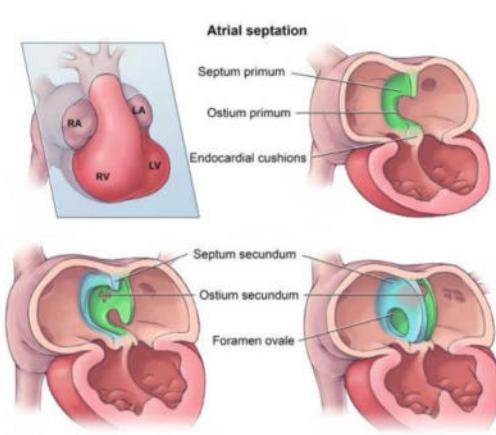
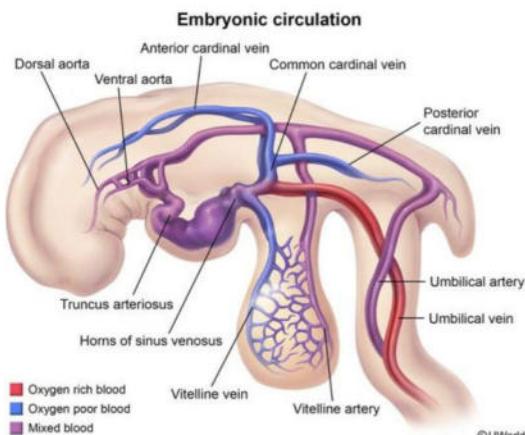
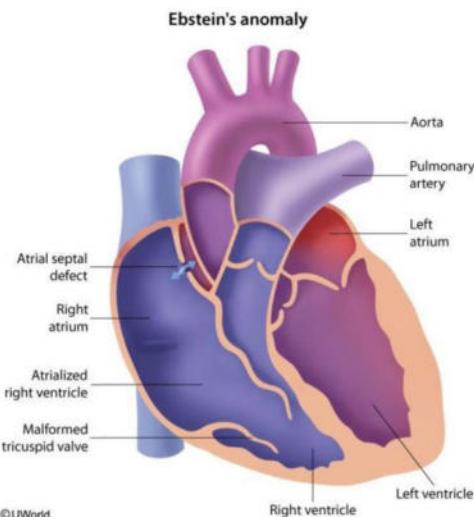
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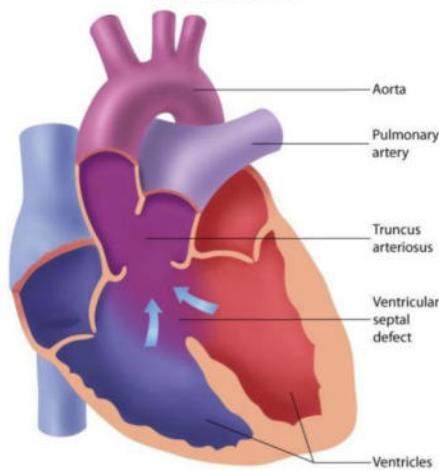
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### Bicuspid aortic valve disease





### Truncus arteriosus



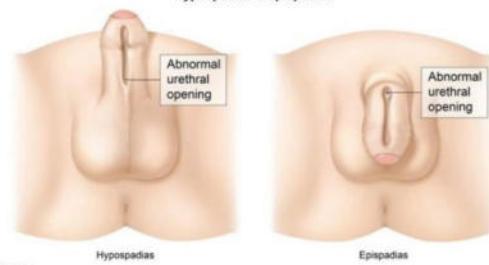
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#### Hypospadias & epispadias



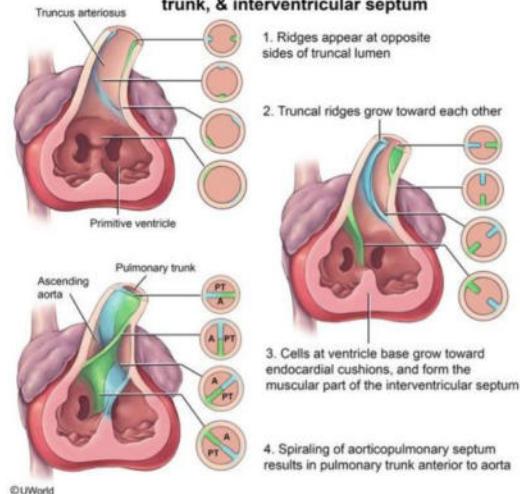
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#### Formation of aorta, pulmonary trunk, & interventricular septum



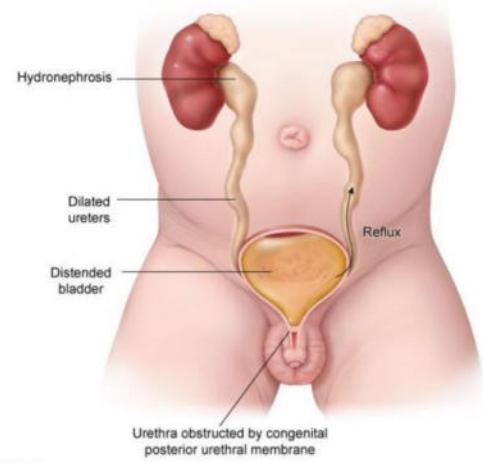
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Posterior urethral valves

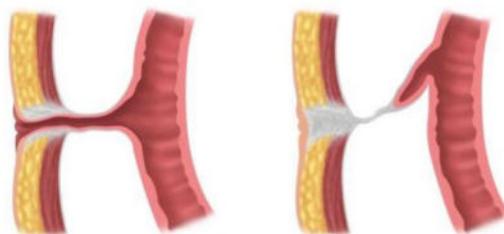


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Vitelline duct abnormalities



Persistent vitelline duct

Meckel diverticulum

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Hirschsprung disease

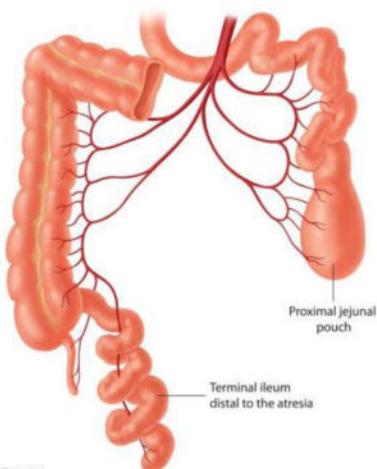


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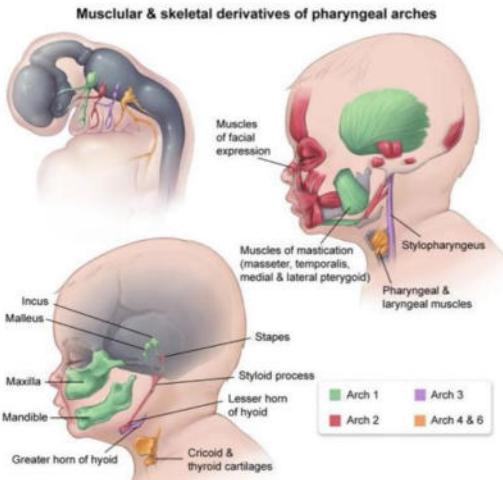
### Apple peel atresia



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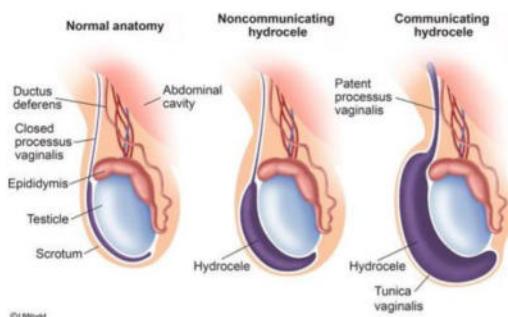
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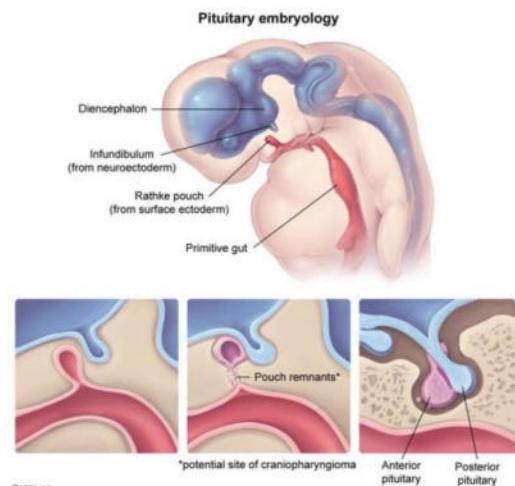
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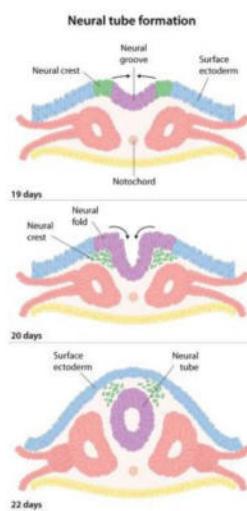
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02:16

Holoprosencephaly spectrum



Median cleft lip/palate



Single-nostri nose,  
hypotelorism (close-set eyes)



Hypotelorism, proboscis  
(non-functioning nasal structure)



Single, central orbital fossa,  
proboscis

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02:17

Palpable purpura (Leukocytoclastic vasculitis)

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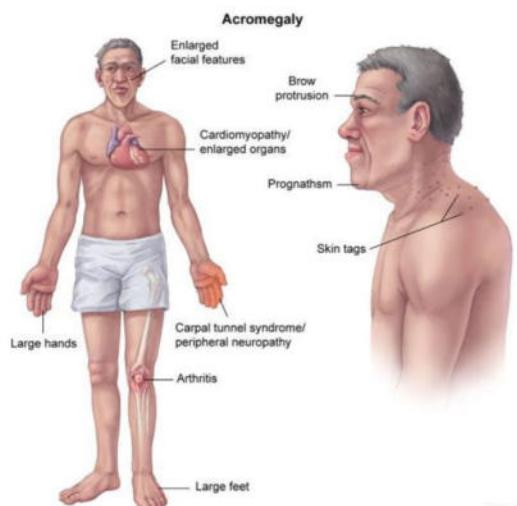
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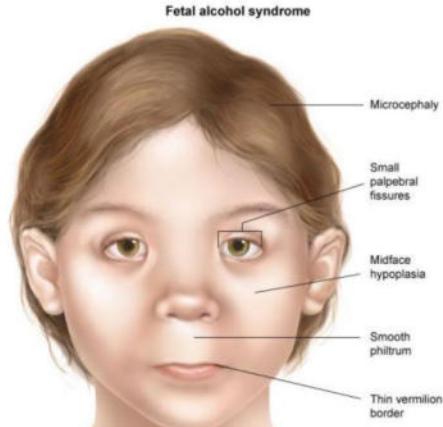
Tinea Versicolor



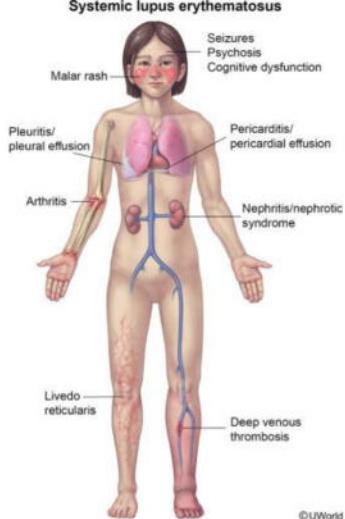
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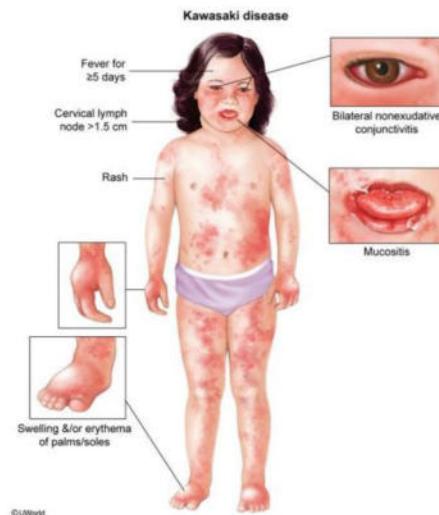
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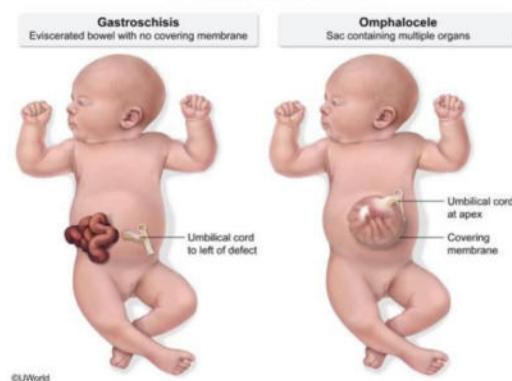


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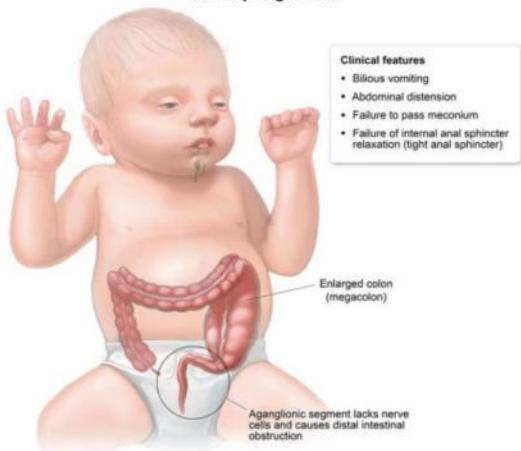
### Gastroschisis vs. omphalocele



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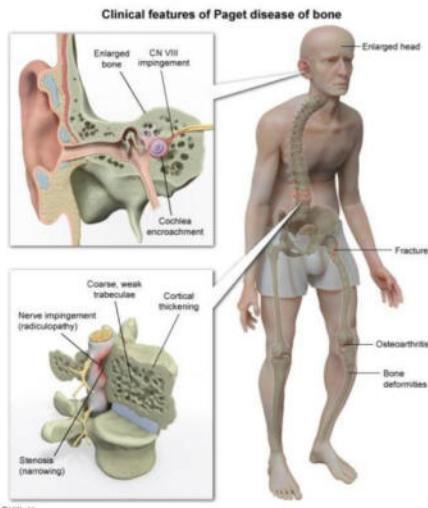


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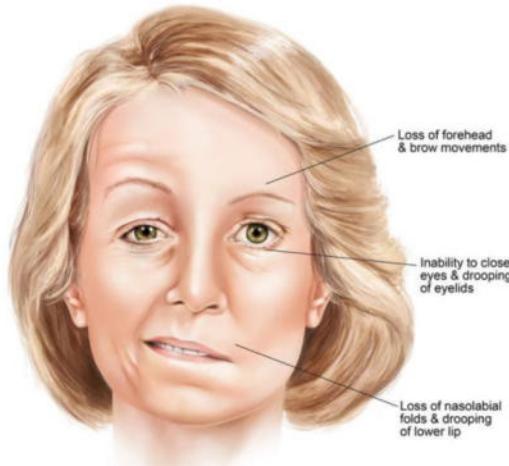
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### Peripheral facial palsy

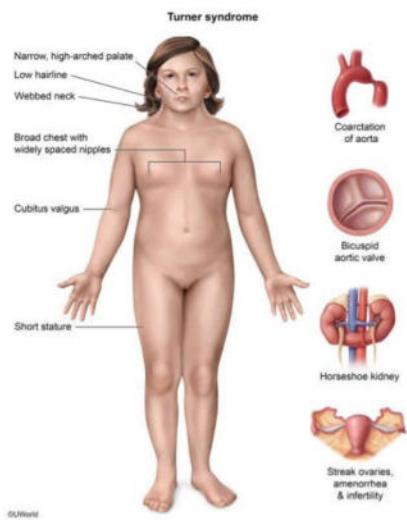


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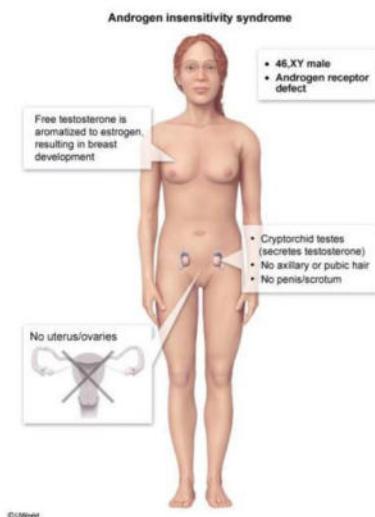
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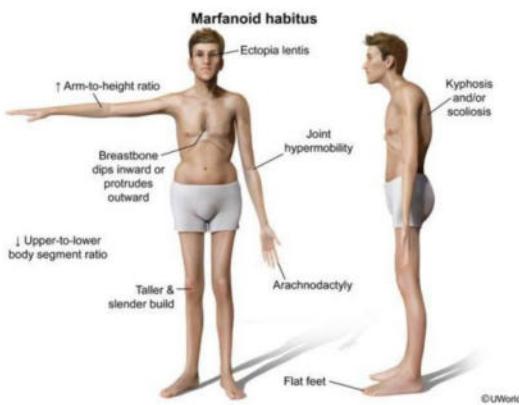
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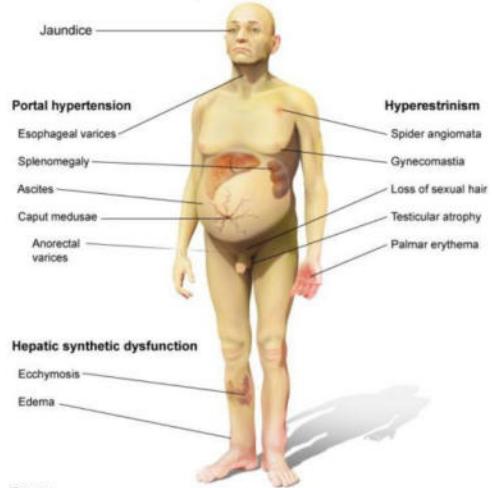
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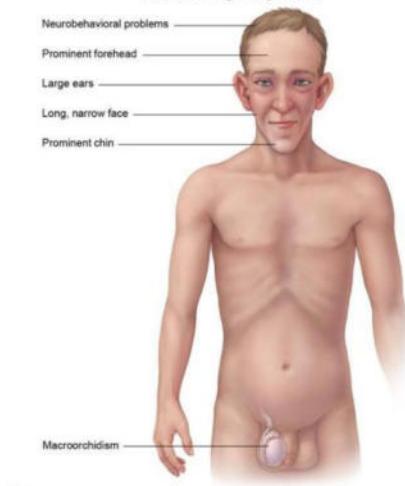
### Signs of liver cirrhosis



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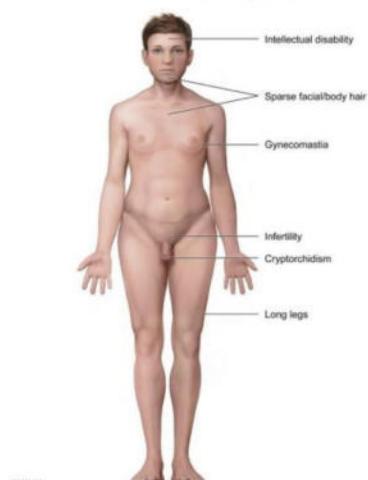
#### Features of fragile X syndrome



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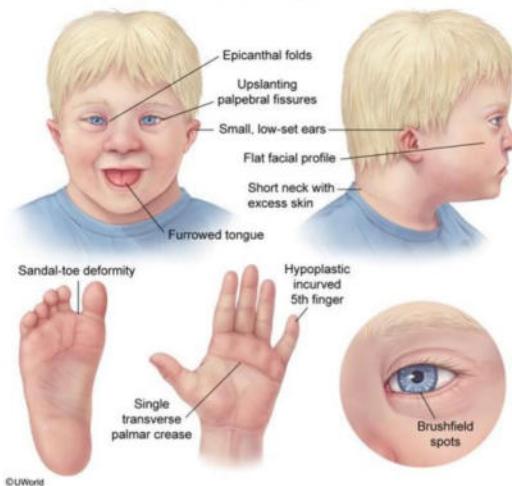
#### Klinefelter syndrome (47,XXY)



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Features of Down syndrome



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Wheal and flare



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Poison ivy contact dermatitis

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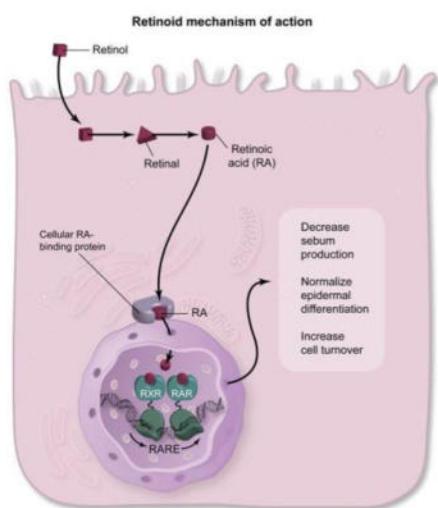
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Perifollicular hemorrhage , Vit C def

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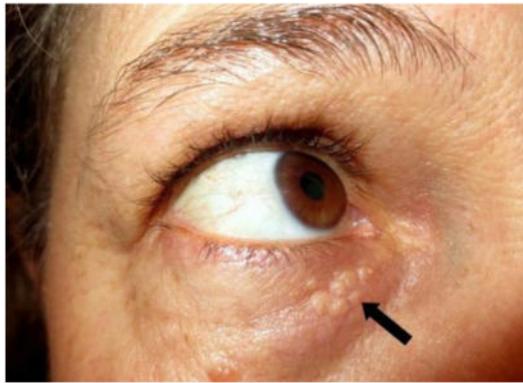
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Nodulocystic Acne



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02:21

Xanthelasma

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02:22

Vitiligo



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02:22



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02:22

Irritant contact dermatitis

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Solar Lentigines – found on sun exposed areas.

vs

freckles (ephelides)

both are disorders involving melanocytes.

freckles --> increased production of melanin

Solar Lentigines --> increased number of melanocytes.

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02:23



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Bacillary angiomatosis

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02:23

Seborrheic keratosis

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02:23



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02:24

Wickham striae

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02:24



**UWORLD IMAGES**

Dermatitis herpetiformis

02:24



**UWORLD IMAGES**

Seborrheic keratosis

02:25



**UWORLD IMAGES**

Pityriasis rosea

02:26

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02:26

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02:26

Cutaneous horn – actinic keratosis

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[UWORLD IMAGES](#)

02:27

Atopic dermatitis



[UWORLD IMAGES](#)

02:27

Atopic dermatitis

U

[UWORLD IMAGES](#)

02:27

Urticaria



[UWORLD IMAGES](#)

02:27

Cutaneous horn

U

[UWORLD IMAGES](#)

02:28

Actinic keratosis



**UWORLD IMAGES**

02:28

Actinic keratosis

**UWORLD IMAGES**

02:28



**UWORLD IMAGES**

02:28

Rash seen in

Urticaria (edema in superficial dermis)

Mast cell dependent + IgE / non IgE dependent

vs

Eczema / atopic dermatitis (edema in epidermis)

vs

Angioedema (edema in deeper dermis and s.c. tissue)

Hereditary Complement deficiency, Aspirin – Mast cell independent

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02:29



Target-shaped lesions on the extremities and trunk that have central dusky area, surrounding a pale ring of edema and peripheral halo of erythema

seen in Erythema Multiforme

M/C cause HSV (usually in adults) , Mycoplasma (in children)



Ichthyosis Vulgaris :-

Inherited disorder due to mutation in Filaggrin gene --> epidermal hyperplasia and defective epidermal desquamation (vs Pemphigus vulgaris – excessive premature desquamation) --> accumulation of epithelial keratinocytes --> dry, scaly/flaky skin (on trunks and extremities esp on legs) with loss of normal barrier function (concomitant pr. of Atopic dermatitis possible)

condition presents since childhood and worsens :-

with aging

in winter months (due to decrease in humidity)

family history of disease present

Palmar hyperlinearity (clue)

can be misdiagnosed as Xerosis cutis



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02:30

seborrheic dermatitis

due to excessive sebum production, hence in scalp, central face, ears and chest

(note)

the superficial scaling with underlying erythematous plaques

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02:30



**UWORLD IMAGES**

02:30

verruca vulgaris (cutaneous warts) caused by HPV

(note)

discrete hyperkeratotic papules

**UWORLD IMAGES**

02:30



**UWORLD IMAGES**

02:30

nodular and ulcerating subcutaneous lesions caused by fungi

Sporothrix

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02:30



**UWORLD IMAGES**

02:31

Mucormycosis

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02:31



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02:31

tinea capitis



Tinea Corporis



Maculo-Papular Rash of Measles (Paramyxo virus)

how ?

note the rash is coalescing and darkening

vs

Rubella

MP rash (Toga CREW) which does not coalesce.

+

spreads faster with postauricular and/or occipital LAD.

both rash starts at the head and spreads downwards.

DD of MP rash :-

Parvo virus -

(slapped) cheek rash --> MP rash in trunk and extremities

VZV

MP rash (more pustular) begins on the trunk --> spread centrifugally

HHV-6 or Roseola (exanthem subitum – means sudden onset)

high grade fever --> subside --> rash on chest and trunk

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pruritic, papulopustular rash which is diffuse and most noticeable on the trunk and extremities,

superficial, self-limited *P. aeruginosa* infection.

usually following exposure to water source  
(swimming pool, resort)

infection of the hair follicles = "hot tub folliculitis"

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SJ Syndrome

rapid onset of erythematous macules with necrosis and skin sloughing. May cause target lesions (vs Erythema Multiforme)

preceded by

Systemic S/S, due to exposure to drugs  
(sulfonamides, allopurinol, phenytoin)



Erythema Multiforme –  
erythematous, round papules that evolve into Target lesions with a  
dusky central area,

(note)

a dark red inflammatory zone surrounded by a pale ring , and an  
erythematous halo in the lesions periphery.

Locations :-

skins of the extremities, trunk, face, neck and can involve the oral  
mucosa and tongue.

Pathogenesis :-

cell mediated immune response (hence, CD8+ T- cells infiltrate)  
against Ag deposited in the skin.

Inciting factors :-

Infection (Mycoplasma, HSV)

drugs (Sulfa, phenytoin, beta-lactams)

Malignancy

Auto Immune

DD :-

Stevens Johnson Syndrome (systemic s/s + h/o drug exposure +  
lesions are necrotic)



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02:33

Dermatitis Herpetiformis

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02:34

necrobiosis lipoidica diabetorum

a dermatologic amnifestations of DM  
(pancreatic beta cell dysfunction)

other manifestations :-

skin tags or acrochordons  
acanthosis nigricans

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02:34



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Porphyria cutanea tarda

condition characterized by skin fragility and blistering lesions in sun exposed areas.

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Bullous vulgaris

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tender papules --> vesicles and flaccid bullae which ruptures to leave significant tan colored crusting

in

### Bullous Impetigo (*S. Aureus*)

Apparently the differentiating feature between it and impetigo is that there is no significant blistering in the latter nor the flaccid bullae.

Exfoliative exotoxin A which is a serine protease which cleaves desmoglein 1 (a cadherin component of desmosomes).

desmosomes are glues which keep the keratinocytes in superficial epidermis together.

vs

SSSS

Bullous Vulgaris

Pemphigus Vulgaris

Herpes Infection

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note the clusters of papules and vesicles caused by HSV .

muco

cutaneous

papules and vesicles, that may evolve into ulcerated and crusted lesions.

localized peri-oral or genital

Gingivostomatitis

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desquamation seen in Pemphigus Vulgaris

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Lentigo Maligna – pigmented lesion in elderly patients.

melanoma-in-situ or malignant melanoma (controversial)

characteristic histologic finding :-

"Multinucleated Giant Melanocytes"

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02:36



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02:36

Ecthyma Gangrenosum – cutaneous necrotic disease due to P. Aeruginosa bacteremia.

in  
immunocompromised,  
febrile neutropenic,  
burns

bacteria gains access to perivascular vessels in dermis and s.c  
-->  
release of toxins [P,E,E,P]  
-->  
vessel destruction --> insufficient blood supply --> necrosis.

vs

Sepsis --> DIC

can occur in same person  
normal platelet count, PT and aPTT.

vs

Necrotising Fasciitis (S. Pyogenes) – excruciating pain + single site of infection --> which spreads progressively  
(no cutaneous necrosis, only erythema, warmth and edema)

vs

TTP-HUS

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Telangiectasias –

small, permanent dilation of superficial capillaries/venules.

blanch under pressure (as the RBCs are contained within the vessel)

commonly seen in :-

aging,  
chronic solar damage,  
long term glucocorticoid,  
rosacea,  
other systemic disorder

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Ecchymosis (> 1 cm)

frequently indicate a deep hemorrhage (hematoma) due to

bony fracture,  
ligamentous rupture,  
muscular injury.

do not blanch under pressure (as the RBCs are not contained in the vasculature eg like in Spider angioma, but are extravasated)

evolution of color change --> used to estimate the age of injury.

blue, red --> brown, green, yellow

Petechia (< 5 mm)

Purpura (> 5 mm to 1 cm)

both are cutaneous or sub-cutaneous collections of extravasated blood.

Associated with Platelet dysfunction or capillary fragility.

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Actinic keratosis -->

premalignant condition characterised by dysplasia of epidermal cells

in elderly, on the sun exposed areas --> damage to keratinocytes.

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localised

papulo-vesicular erythematous rash with blisters, ulcers and weeping drainage.

seen in

acute Allergic Contact Dermatitis (ACD)

or

Eczematous dermatitis (eczema)

a delayed type 4 HST Disorder (to localised antigen exposure)

histologically,

"spongiosis" accumulation of edema fluid in the intercellular spaces of the epidermis

-->

intraepidermal vesicles (note)

--> (chronic)

lesion will be less edematous and weepy

with

thickening of Stratum spinosum + Hyperkeratosis (Lichenification)

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explosive appearance of multiple SEBORRHEIC KERATOSIS

("stuck on")

associated with metastatic Internal adenocarcinoma (GI)

if gastric adenocarcinoma then associated presenting s/s

Specific S/S :-

virchow's (left supraclavicular LAD)

sister mary joseph's nodule (perumbilical mass)

epigastric pain, hematemesis, occult blood loss,

General S/S :-

fatigue, weight loss, early satiety

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Facial Angiofibroma

as a part of Neurocutaneous Syndrome (Tuberous Sclerosis)

along with

hypopigmented macules,  
periungual fibromas,

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localized area of pruritus (vs Atopic dermatitis – diffuse rash)

seen in Contact Dermatitis

(Type 4 HST) to nickel belt buckle exposure.

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White, Lacy markings – Wickham Striae

seen in Lichen Planus

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02:39

Rash of Atopic dermatitis (intense pruritus)

intermittent presentation with relapsing remitting course.

ass. with Allergic Rhinitis and Asthma (allergic triad)

appearance early in childhood (<5 years)

due to defect in epidermal surface protection Proteins.

increased IgE + Eosinophilia.

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#### 5 Ps of Lichen Planus

Pruritic,  
Purple/Pink  
Polygonal papules  
Plaques

distributed symmetrically over the flexor surfaces of the wrist, ankles, nail, oral mucosa, genitalia.  
associated with hepatitis C.

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subcutaneous nodules spreading along the lymphatics -->

Sporotrichosis (a subcutaneous mycosis)

introduced by a break in skin.

initially, reddish nodule --> Ulcerates.  
biopsy --> granuloma.

treatment :- Itraconazole / SSKI

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#### CHERRY HEMANGIOMA

benign vascular tumor in adults,  
only affecting the skin NOT mucosa

typically appear in 30s-40s --> do not regress --> may multiply with age.

vs

#### STRAWBERRY HEMANGIOMA

in infancy --> increase in size --> may regress in childhood  
(5-9 years)

both are a capillary hemangioma

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#### SKIN TAGS / Acrochordons

pedunculated outgrowths of normal skin.

seen in areas of friction (neck, axilla, inframammary, groin) in pts. with obesity and DM.

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**ACTINIC KERATOSIS :-**

usually small (<1 cm). erythematous epidermal lesions with adherent scale that are the result of chronic sun exposure.

**Histology :-**

atypical keratinocytes (dysplasia)  
hyperkeratosis,  
parakeratosis.

May progress to SQUAMOUS CELL CARCINOMA.

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**Basal cell carcinoma of the skin**

note the pink, pearly papule with central ulceration/depression

on microscopy :-

1. nests of basaloid cells with peripheral palisading of nuclei.

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Basal cell Carcinoma of the skin

waxy, pink, pearly nodule with central ulceration

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Psoriasis

ass. with arthritis esp. those with nail pitting. (triad)

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Erythema Nodosum (painful red nodules)

+

Pyoderma Gangrenosum

dermatologic manifestations of IBD

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dermatologic manifestations with IBD :-

Pyoderma Gangrenosum -

(esp ulcerative colitis) ??

Erythema Nodosum – painful red macule/patch

(not raised nodule as in the name)

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Lichenification in the flexural distribution

(neck, wrists, antecubittal fossa and popliteal fossae)

manifestation of Atopic dermatitis / Eczema

in children or adult.

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MOLLUSCUM CONTAGIOSUM

single or multiple smooth, 2–6 mm wide, skin-colored and firm,

pearly papules often with central umbilication.

caused by DNA Pox Virus

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Candida intertrigo causing

erythematous plaques and erosions with satellite papules and pustules  
in

axillae,  
genital areas,  
skin folds,  
breast folds.

(causing pruritus --> scratching)

on microscopy – Budding Yeast can be seen

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02:43



#### UWORLD IMAGES

02:43

small erythematous papules on the palm with excoriations (due to intense pruritus --> scratching)

which extend to the wrist creases, arms, axillae.

Sarcoptes scabiei –

an ectoparasite which burrow into the "stratum corneum"

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#### UWORLD IMAGES

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Psoriasis –

symmetric, sharply defined skin plaques with overlying silver scales

usually found on

the extensor elbows, knees and scalp.

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Deposition of calcium phosphate salts (in the arterioles)

leads to  
calcific uremic arteriolopathy (calciphylaxis)

in pt. with ESRD receiving hemodialysis – presenting with  
painful nodules, plaques and ulcers.

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Stasis Dermatitis – erythema, induration, fibrosis and deposition of hemosiderin (due to extra vasated RBCs) manifesting as  
reddish-brown discoloration of skin.

a complication of Chronic Venous insufficiency.

symptoms are B/L usually worse at or above the ankles.

poor wound healing  
weeping and ulceration.

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Cutaneous Candidiasis (in the intertriginous area)

can become invasive if there is disruption in the normal skin barrier.

causes inflammatory, moist, weeping, erythematous lesions.

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Tinea Corporis – microbial infection of keratinized structures in the stratum corneum only.

fungal infection with dermatophytes (trichophyton rubrum – most frequent culprit)

esp in hot and humid weather via Skin Contact.

note the annular/polycyclic rash with raised, scaly border and central clearing

DD :-

Erythema Migrans – Lyme's disease

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02:45

ERYTHEMA MARGINATUM –  
a fleeting pink or red rash with central clearing that can appear,  
disappear and reappear within hours.

along with,

J -Migratory arthritis

O-Carditis

N-Subcutaneous nodules

S-Sydenham chorea

for the diagnostic basis of Acute Rheumatic Fever.

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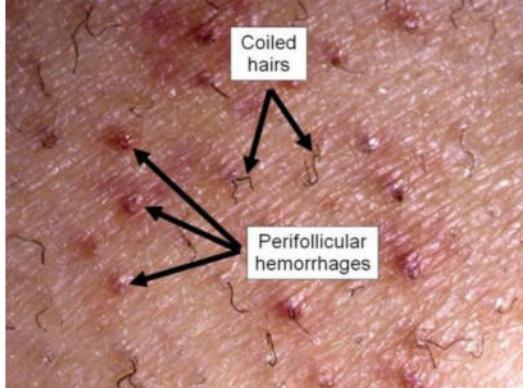
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Gingival Swelling and Bleeding – VITAMIN C deficiency

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**UWORLD IMAGES**

02:45

seen in Vitamin C deficiency

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erythematous plaques with overlying silvery scales over the elbow  
(and/or knees)

**PSORIASIS**

chronic inflammatory cascade

precipitated by minor trauma (Koebner phenomenon) in predisposed individual

explosive onset may be associated with HIV Infection

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(just so you can have mental image of the term – FISSURES)

Irritant contact dermatitis present with pruritic or painful erythema in areas of exposed skin (eg hands).

It can occasionally cause small vesicles or fissures.

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02:46



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02:46

Mites – which cause scabies

affects the interdigital skin (vs Taenia Pedis) and

presents with small papules --> pustules and burrows.

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02:47

seen in scabies

affects the interdigital skin.

presents with small papules, pustules and burrows.

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pruritic red/brown, Serpiginous Tracks in the skin seen in Cutaneous Larva migrans.

hookworms – Ancylostoma Duodenale, Necator americanus

threadworms – S. stercoralis.

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chronic *Tenia Pedis* causing hyperkeratotic rash extending up the sides of the feet (moccasin pattern)

Initial treatment with,

Topical anti-fungals (Clotrimazole, Miconazole)  
Terbinafine.

Oral therapy reserved for pt. who fail initial treatment.

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#### UWORLD IMAGES

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Leukoplakia – a benign lesion of the tongue.

caused by hyperplasia of the squamous mucosa that can evolve into dysplasia --> carcinoma in situ --> invasive cancer.

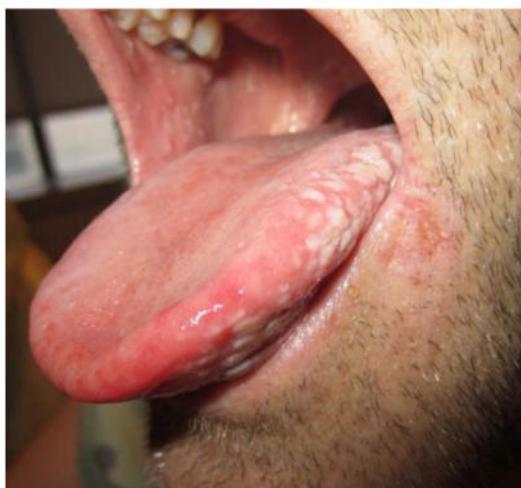
appears a white patches/plaque which CANNOT be scrapped

vs

Thrush caused by Candida which can be easily scrapped off.

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Thrush caused by candida.

creamy white, plaque-like lesions on the

buccal mucosa

palate

tongue

pharynx

can be easily scrapped off, revealing underlying erythematous mucosa.

vs

Leukoplakia – white patches/plaques on the oral mucosa which cannot be easily removed with scraping.

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cluster of vesicles on the fingers – HERPETIC WHITLOW

in HSV 1

vs

diffuse blisters/vesicles on the palms

in COXSACKIE A

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Vesicular rash involving the foot as part of HFM Disease caused by Coxsackie A Virus.

remember :-

vesicular lesions in HFM Disease affect

(COXSACKIE A)  
buccal mucosa,  
tongue and  
soft palate

vs

cluster of vesicles on  
hard palate and lips in HSV 1  
with  
swollen gum involvement

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02:49

"vesicular rash" – as seen in Chicken Pox

diffuse vesicular rash of different stages.

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02:49

MP Exanthem – seen in measles

(starts at the neck and spreads down to the trunk (centrifugal) sparing  
the palms and soles)

paramyxoviridiae :-

Parainfluenzae (croup – steeple sign, barking cough with ins stridor)  
measles,  
mumps,  
RSV,

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erythema migrans – erythematous, migrating bull's eye rash

seen in

Early localised LYME'S Disease (+ fever, myalgia, arthralgia)

Late Disseminated disease S/S –

Carditis, B/L Facial Palsy and Arthritis.

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Impetigo –

usually peri-oral (in newborns and children)

no pruritic papules --> pustule which breaks down

to leave a golden yellow/ honey crustings

causative organisms :-

staph. Aureus > GAS

treatment :-

Topical antibiotic (mupirocin)

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02:49



**UWORLD IMAGES**

02:49

M-P rash seen along with fever, LAD, Condyloma Lata

in secondary syphilis.

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02:50



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02:50

Generalised Macular eruptions seen in 2ndary syphilis.

along with

Condyloma Lata (painless wart like lesions in the genital region)  
LAD

with constitutional s/s

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Petechial Rash

may be seen in various conditions.

meningococcemia

ricketssia. transmitted by Dermacentor Tick bite

causing triad of headache, fever, rash (vasculitis)  
@ wrist and Ankles – spread centripetally.

bcz the bacteria localised and proliferated in Blood Vessel endothelial cells.

one of the 3 conditions where rash involves HANDS AND SOLE

RMSF

2nd Syphilis

Coxsackie B

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Erythema Multiforme

a hypersensitivity reaction following infection with HSV.

Target shaped lesions which are PRURITIC @ the distal extremities

vs

ERYTHEMA MIGRANS (with central clearing) caused by Borrelia by ixodes tick bite

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02:50



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bacillary angiomatosis (in immunocompromised pts)

due to Bartonella Henselae.

in immunocompetent –  
cat scratch disease – a local papule with regional LAD

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02:51

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02:51

Staph. Aureus

colonizes in Anterior Nares --> spread to skin.

defects in the mucosal or cutaneous barrier can lead to invasion.  
commonly,  
skin and soft tissue abscess

a localised pustule that evolves over days

into

a painful nodule (in the diagram) with a necrotic, purulent center and surrounding indurated erythema.

colonization with MSSA < risk of illness.

colonization with MRSA > likely to cause disease due to expression of Virulence Factor – LEUKOCIDIN.

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02:51



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02:51

M-P rash seen in Measles

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02:51



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02:51

"slapped cheek rash" in Parvo Virus infection.

(ds DNA virus)

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02:52



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02:52

vesicular lesions on the foot as part of

HAND, FOOT, MOUTH Disease in infant due to coxsackie virus infection.

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vesicles on Hand :-

seen in

Coxsackie Virus (in Infants)  
Syphilis (secondary)  
Rocky Mountain Spotted Fever

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02:52



**UWORLD IMAGES**

02:52

Molluscum contagiosum

infection with DNA Poxvirus.

smooth, whitish, skin-colored, firm pearly papules with central umbilication.

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02:52



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02:52

Condyloma Acuminata or genital warts

caused by HPV (5,6,11)

skin colored, white-grey verrucous papules

MEN – penile glans and Shaft

WOMEN – vulvo-vaginal, cervical areas

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Erythema Nodosum

(tender, subcutaneous nodules) usually on the lower extremities.

Löfgren's Syndrome (arthralgia, B/L hilar LAD, Rash)  
(a variant of Sarcoidosis)

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Seborrheic Keratosis (abrupt onset)

a paraneoplastic syndrome associated with Gastric Adenocarcinoma.

due to ?

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02:53

"Angikeratoma"

in Fabry's Disease (alpha-galactosidase A deficiency)

seen in conjunction with

Neurological S/S (numbness, tingling + Burning in Hands + Feet)

Cataracts.

this variant usually presents late.

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02:53



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Cherry red – sphingolipidosis

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02:54



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02:54

Acanthosis

**UWORLD IMAGES**

02:54



**UWORLD IMAGES**

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Pretibial myxedema

**UWORLD IMAGES**

02:54



**UWORLD IMAGES**

02:54

Grave Ophthalmopathy

**UWORLD IMAGES**

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**UWORLD IMAGES**

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Mucosal neuroma MEN2B

**UWORLD IMAGES**

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Acanthosis

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**UWORLD IMAGES**

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02:55

Maculo-Papular Rash – "Descending" + "Centrifugal" Pattern

Location :- Back, Trunk spreading to extremities SPARING foot/palms.

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Rubella

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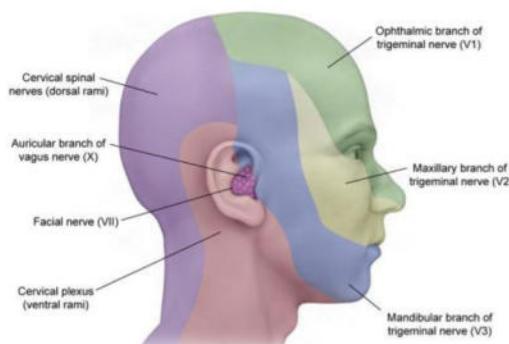
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Purpura meningococcal meningitis

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02:57

## Dermatomes of head & neck

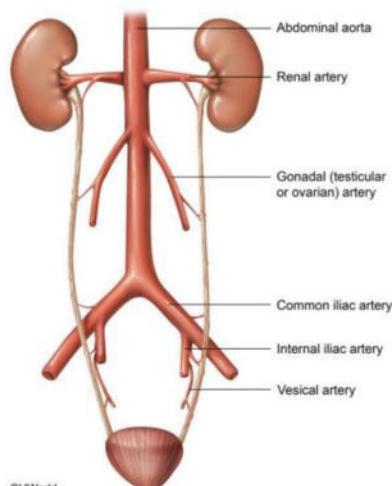


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### Urteral circulation



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blood supply of the ureter

proximal -- Renal artery

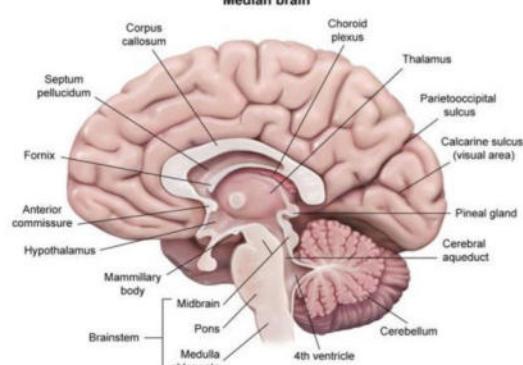
distal – superior vesical

middle ma – highly variable

## UWORLD IMAGES

02:58

### Median brain



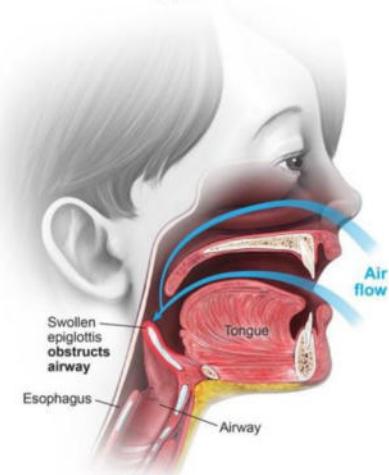
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## Epiglottitis



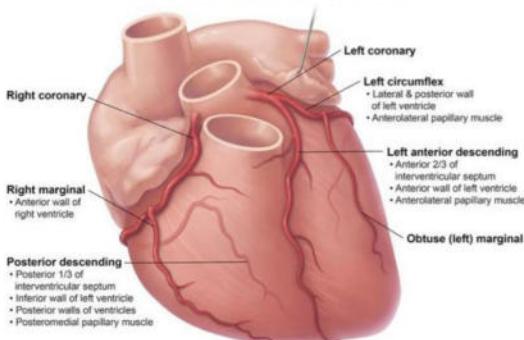
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## Right dominant coronary artery circulation



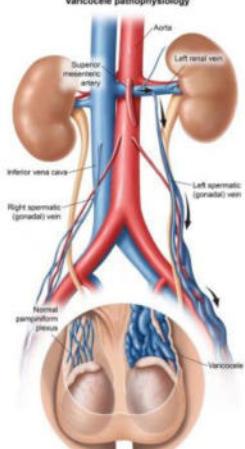
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## Varicocele pathophysiology

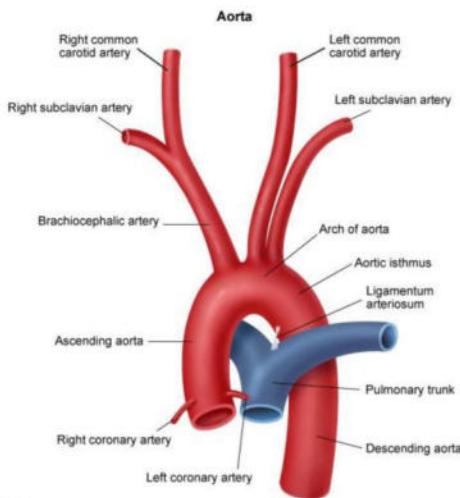


The aorta & superior mesenteric artery compress the left renal vein.  
The increased pressure in the left renal vein causes retrograde blood flow to testes & dilation of the pampiniform plexus.

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Aortic Isthmus ->

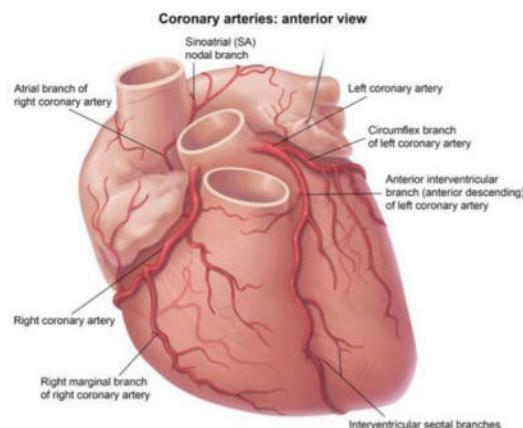
most likely part of aorta to be damaged/rupture in

"blunt/ traumatic aortic rupture" as it is relatively fixed/immobile due to attachment of ligamentum arteriosum.

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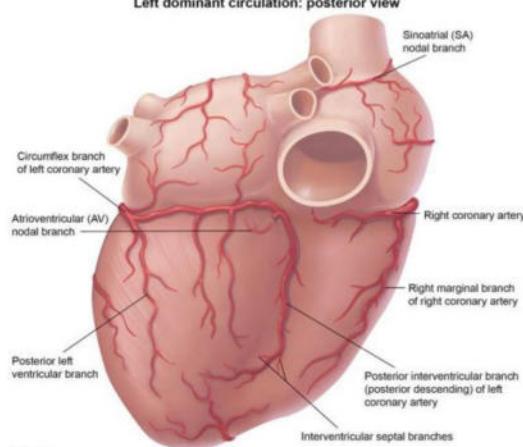
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Left dominant circulation: posterior view



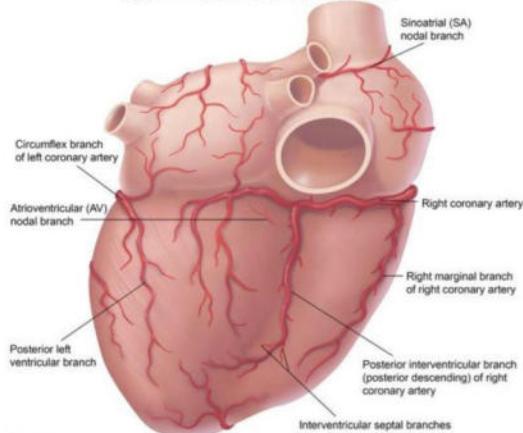
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## Right dominant circulation: posterior view

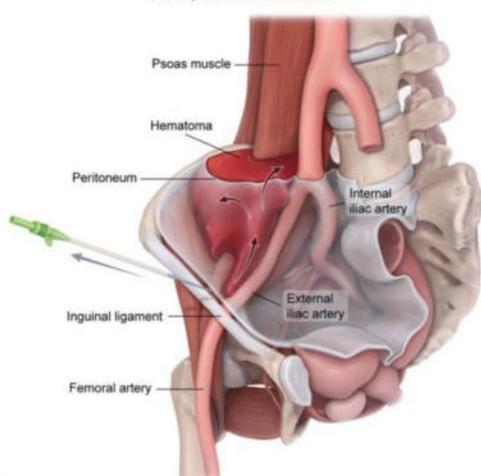


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## Retroperitoneal hematoma



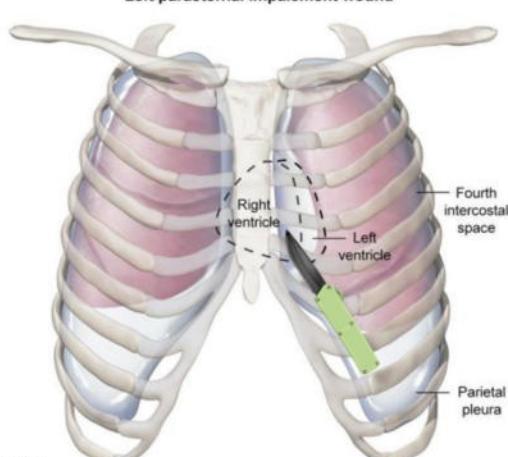
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## Left parasternal impalement wound



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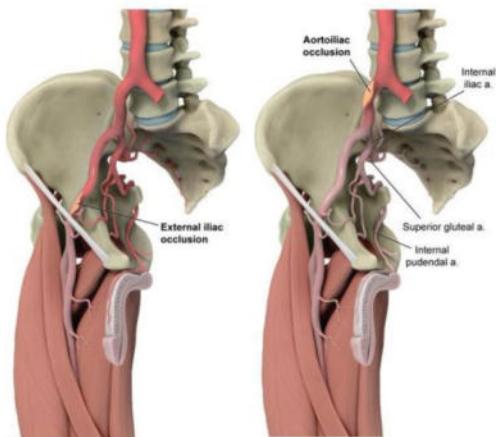
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02:59

Thigh claudication

Thigh claudication +  
gluteal claudication & impotence  
(Leriche syndrome)



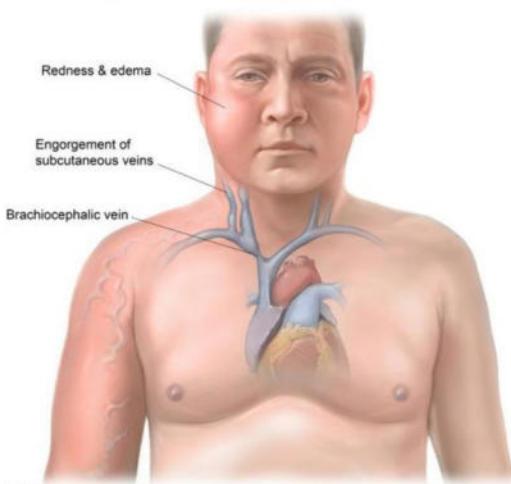
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Right-sided brachiocephalic vein obstruction



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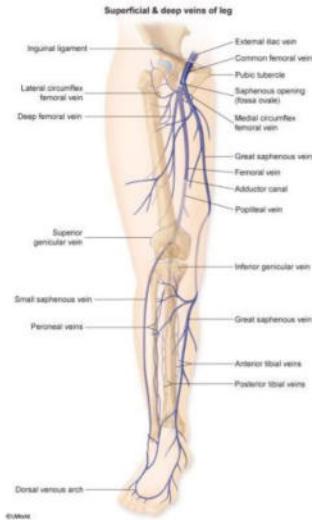
etiology :-

1. Lung Tumor at the Apex
2. long term central venous catheter placement.

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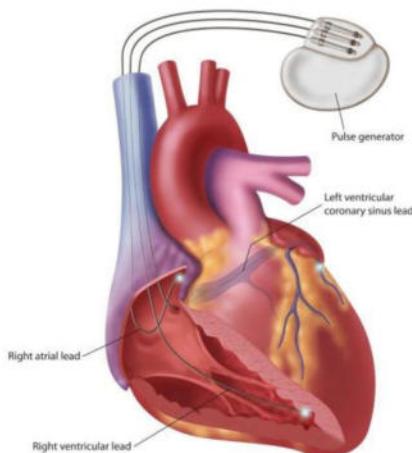


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Biventricular pacemaker

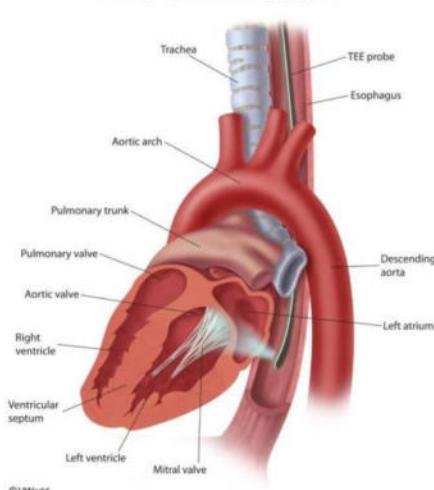


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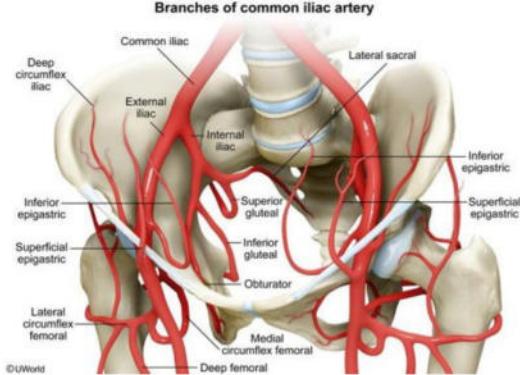
Transesophageal echocardiography (TEE)



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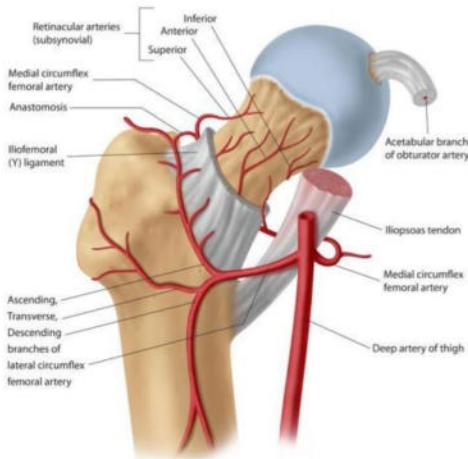


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03:00

Femoral head arteries, anterior view



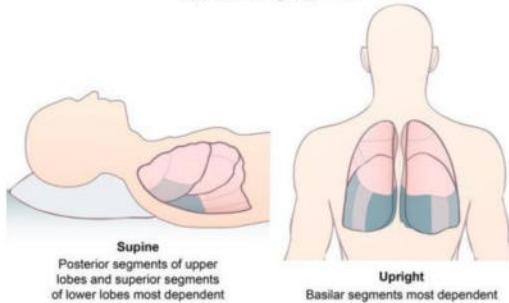
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## UWORLD IMAGES

03:00

Dependent lung segments



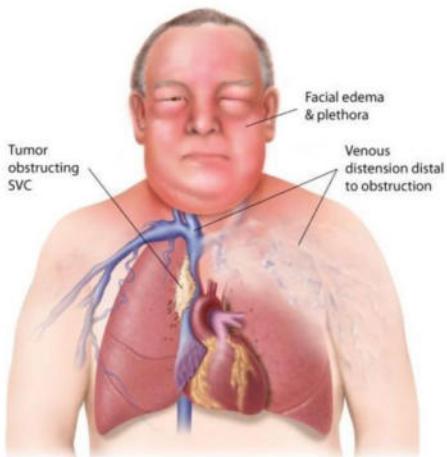
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## UWORLD IMAGES

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## Superior vena cava syndrome



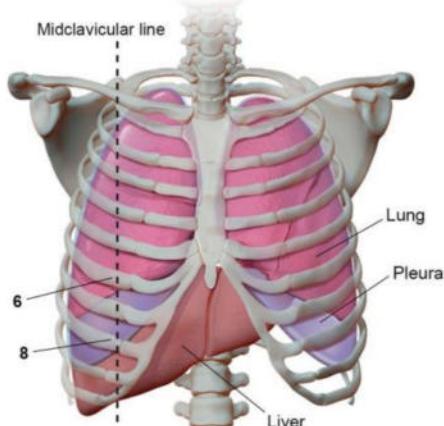
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### UWORLD IMAGES

03:00

Anterior



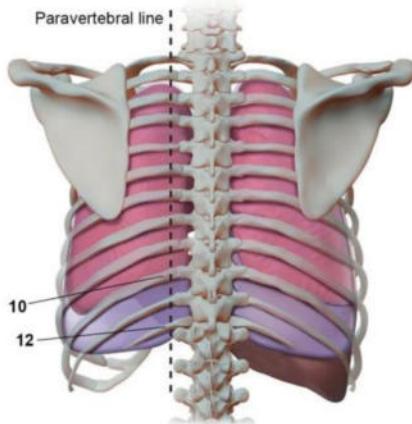
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### UWORLD IMAGES

03:00

Posterior



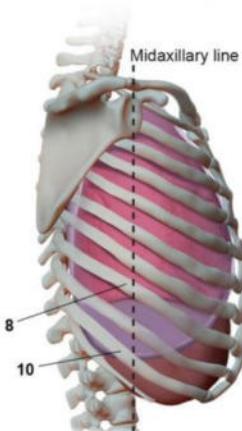
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### UWORLD IMAGES

03:00

Lateral



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03:01

thoracentesis

(below the 6th rib along the mid clavicular line)

Intercostal Nerve, artery, vein

run in the subcostal groove at the lower border of the rib.

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03:01

Thoracentesis

(to be performed below the 10th Rib along the paravertebral line)

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03:01

thoracentesis

performed below the 8th rib along the mid-axillary line.

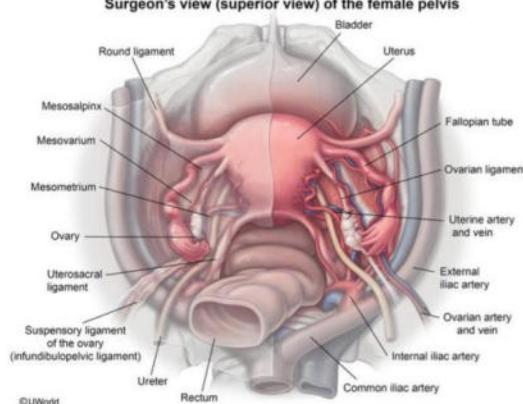
(b/w 8th to 10th rib)

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03:02

Surgeon's view (superior view) of the female pelvis



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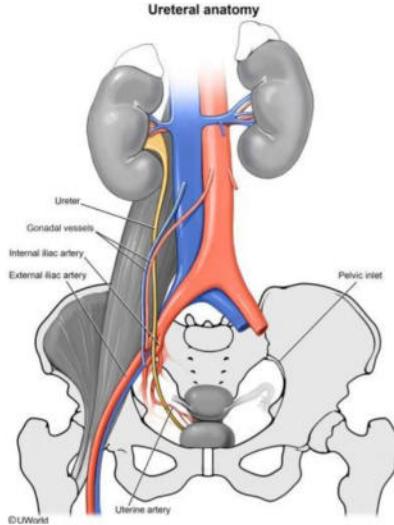
03:02

The ureters course along the uterosacral ligament and passes under the uterine artery.

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03:02



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03:02

The ureters lie close to the iliac vessels.

They pass anterior to the Iliac Vessels and just posterior to the uterine arteries, near the posterior fornix of vagina.

They are at increased risk of damage (unintentional ligation during Pelvic surgeries) -->

post-op (around a week) presentation of patient with

FLANK PAIN (+-radiating to the groin)

BALLOTABLE (U/L) Flank Mass.

Post Surgeries,

pt. are at increased risk of Deep VEin THrombosis and PUlmonary INFarction (overall)

pts undergoing Prostatectomy/ Bladder Surgery --> VesicoUreteral Reflux --> Pyelonephritis or Hydroureteronephrosis.

The ureter course from the renal pelvis to the bladder.

Initial course is retroperitoneal, lie on the Psoas Major muscle. halfway B/w the kidney and the bladder it passes under the gonadal vessels.

@the Pelvic Inlet lies anterier to the External Iliac vessel (here the common iliac vessels bifurcate)

in the pelvis, it lies medial to gonadal vessels and passes along with the uterosacral ligament and under the uterine arteries to insert in the

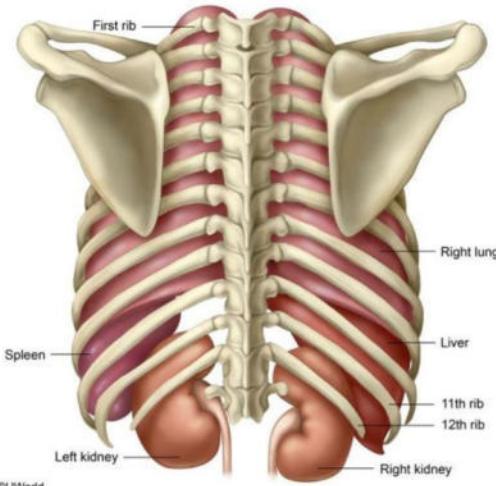
bladder trigone.

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03:02

Posterior view of ribs & underlying organs



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03:02

### KIDNEYS :-

11th and 12th (floating) Ribs Overlie kidneys.

most likely to get lacerated by 12th rib (in case of posterior trauma)

### LIVER :-

fills most of the Upper Right Abdomen.

Right 8,9,10,11 Ribs overlie Liver.

### SPLEEN :-

Left Superior Abdomen; retroperitoneal

Left 9,10,11 Ribs overlie Spleen.

### PANCREAS :-

partially retroperitoneal structure

body of L2 Vertebrae overlies its (neck and body)  
can be injured in Compressive Abdomen Trauma.

### VISCERAL PLEURA :-

normally covers the Lungs.

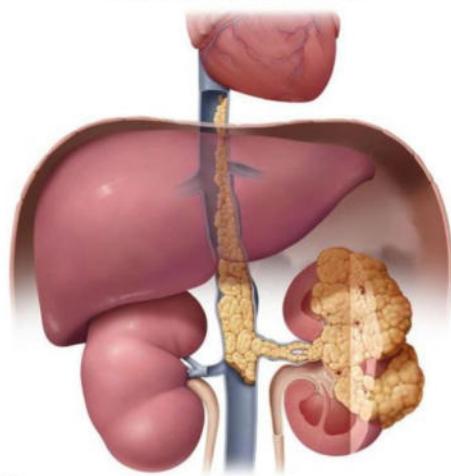
Inferior margin of lungs (at rest) lies at the level of 7th Rib  
on deep inspiration, shifts downwards till the 12th Rib.

fracture of 1,2,3,4,5,6, ribs can damage it.

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RCC accounts for >90% of renal malignancies.

**Presentations :-**

**Classical**

of triad of Hematuria, Flank Pain and Palpable Mass occurs in <10% pts.  
and that too in advanced cases.

**Metastasized at presentation :-**

1. to Bone :- Osteolytic Bone Lesions (hyper Ca+)

2. spread to Renal Vein --> IVC :- presents with B/L Lower limb edema  
and lower abdominal collateral veins (if spread is slow)

**Risk Factors :-**

Smoking > Obesity > HTN

Familial – Germline Mutation in VHL gene (on chromosome 3p)

or

Sporadic Mutation VHL gene

P – PTHrp (hyper Ca+)

E – EPO (rare; but classic)

A – ACTH

R – Renin

neoplastic syndromes

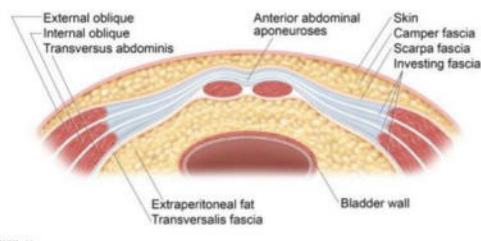
**Clear Cell Variant (M/C)**

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## Suprapubic abdominal wall



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Bladder is Extra-Peritoneal Structure.

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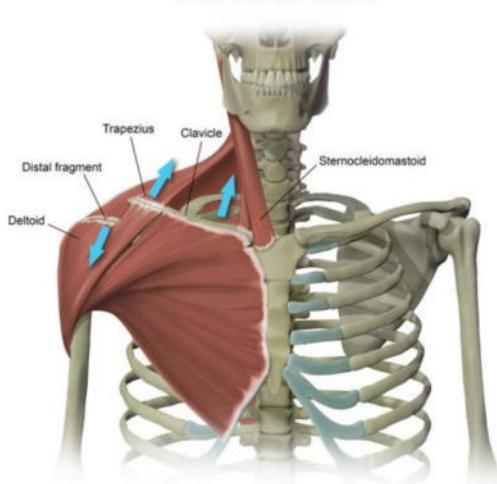
Aponeurosis is pierced in Suprapubic cystostomy

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Distal clavicle fracture



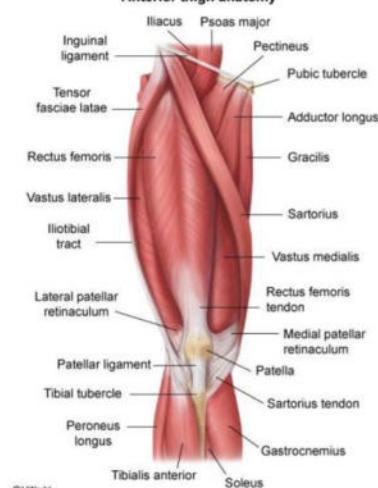
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#### Anterior thigh anatomy



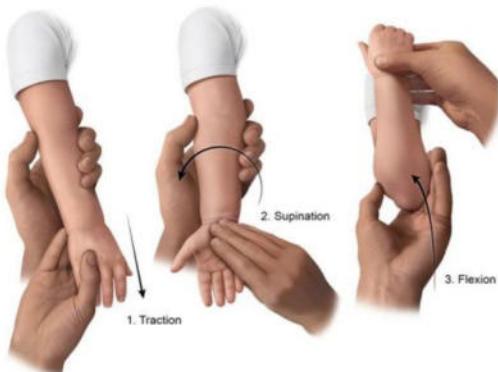
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Supination & flexion



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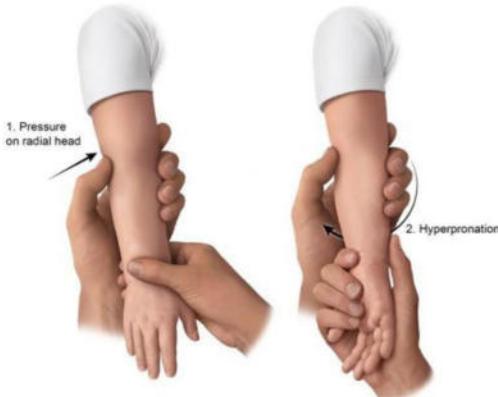
Reduction of the "Radial Head Subluxation"

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Extension & hyperpronation



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reduction of the "Radial head subluxation"

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Radial head subluxation (nursemaid's elbow)

Normal → Traction → Annular ligament displacement



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Note the entrapped annular ligament

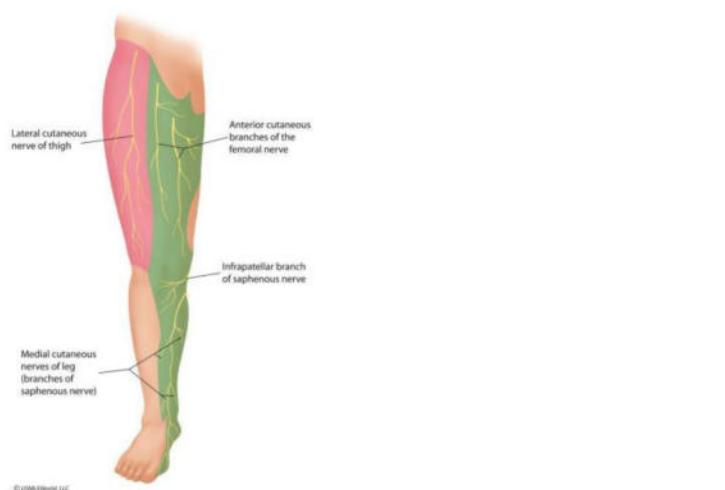
between "the radio-humeral joint"

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Anterior cutaneous nerves of leg

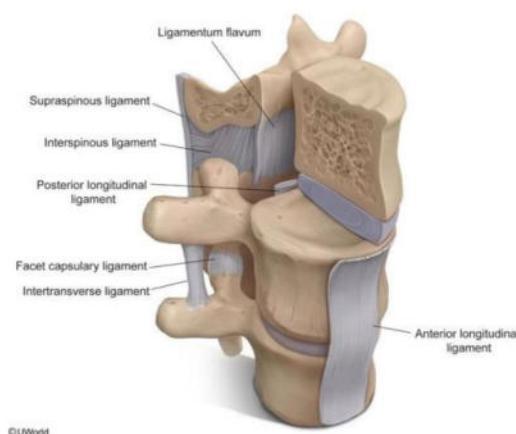


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Vertebral ligaments



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Shopping cart sign



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### Spinal Stenosis

(neurogenic claudication – pain which occurs on walking)

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**Thoracic outlet syndrome**

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the Scalene Triangle is formed by

"Anterior Scalene" Anteriorly (transverse processes of C3–C6 and inserts on the Scalene Tuber on the 1st Rib)

"Middle Scalene" Posteriorly (transverse processes of C2–C7 and inserts on the 1st Rib Posteriorly)

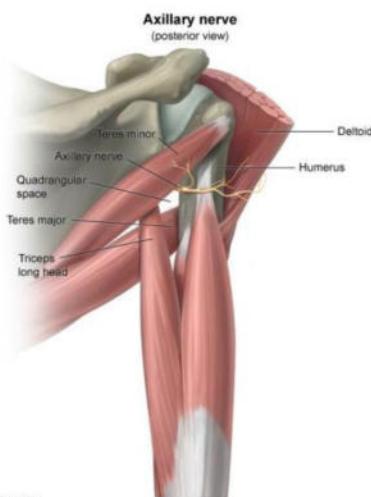
"First Rib" Inferiorly

Thoracic outlet refers to the area above the thorax lined by the cervical vertebrae posteriorly and Sternum anteriorly.

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Entrapment of the Axillary nerve in the quadrangular space results in impaired adduction and sensory loss along the lateral area of the shoulder.

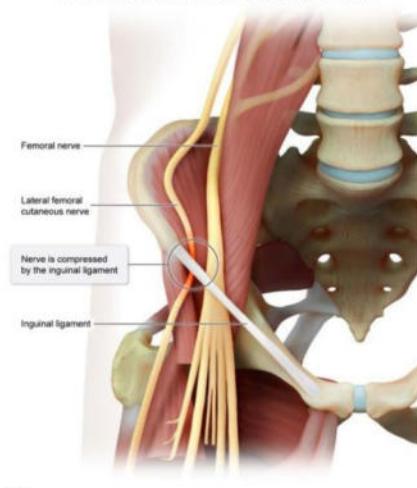
the Quadrangular space is lined :-

1. Inferiorly by the Teres Major
2. Medially by Long Head of Triceps Brachii.

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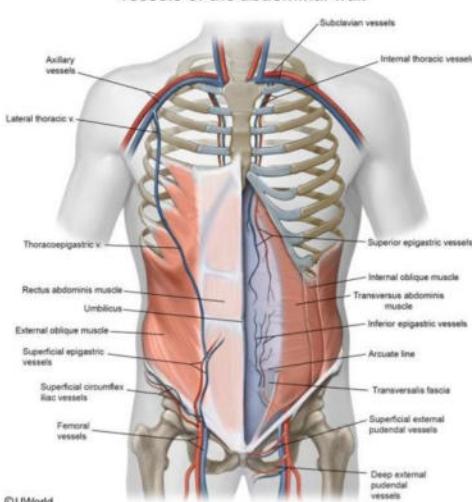
Lateral femoral cutaneous nerve & meralgia paresthetica



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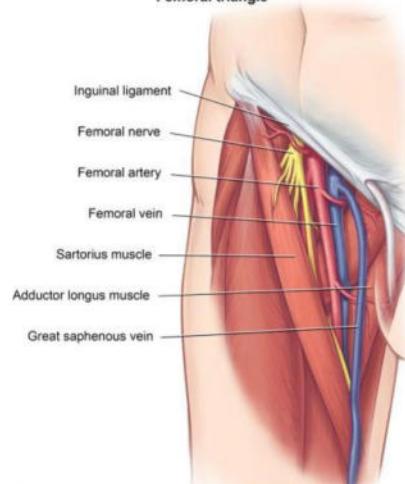
Vessels of the abdominal wall

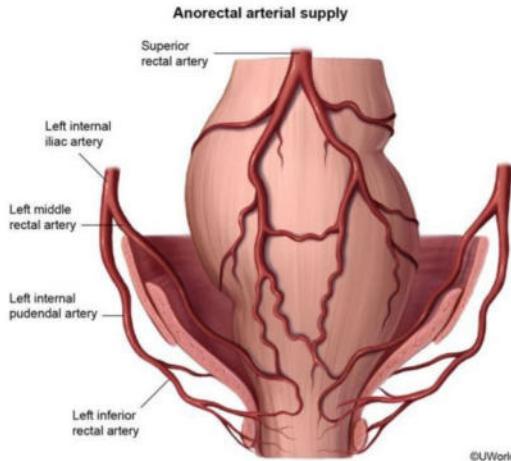


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Femoral triangle





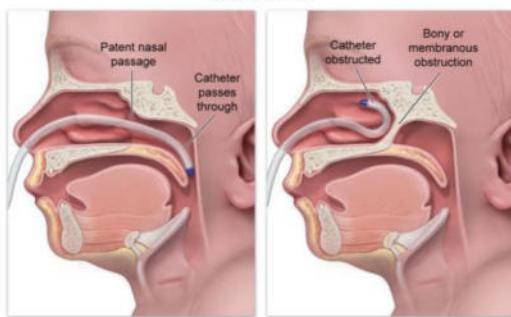
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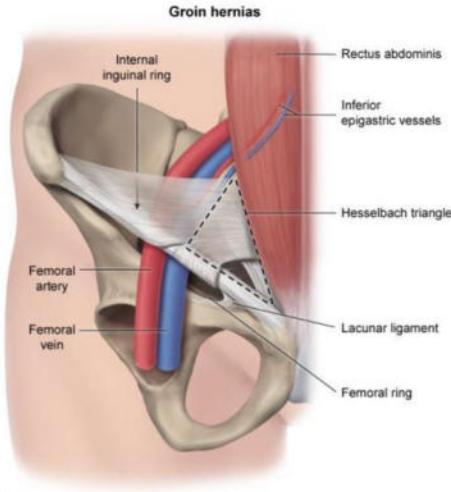
"Anal fissures are usually found in Posterior Mid-Line distal to dentate line"

due to relatively less blood supply, delaying healing of mucosal injury caused by chronic constipation and excess pressure in the anal canal.

"anterior midline fissures" usually occur due to mechanical stresses due to alignment of muscular fibres in the external sphincter.

Choanal atresia





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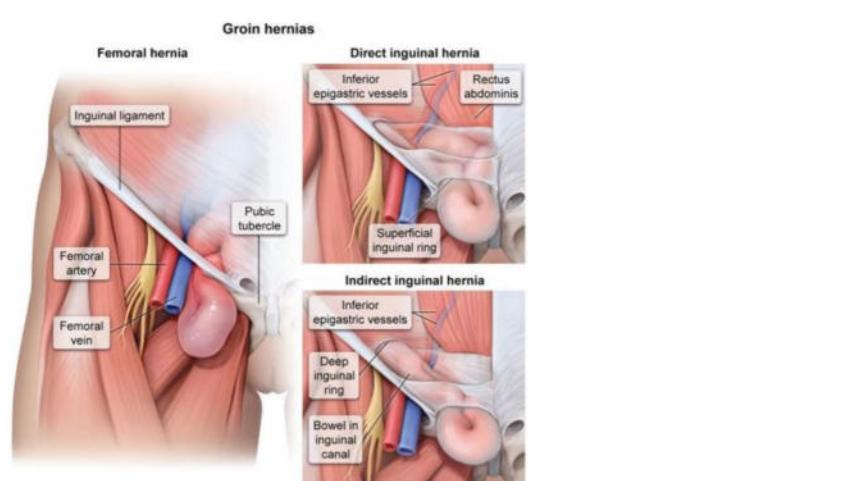
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note the lacunar ligament forming the medial boundary of the femoral ring.

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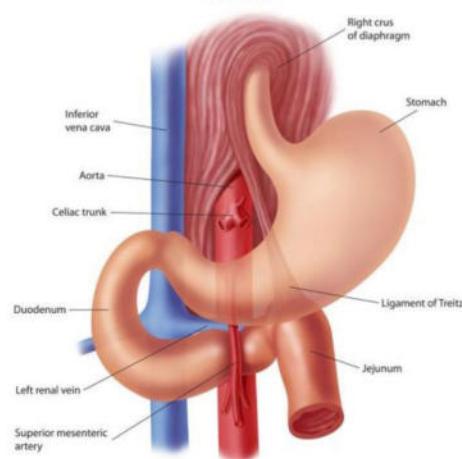
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Superior mesenteric artery syndrome  
Anterior view

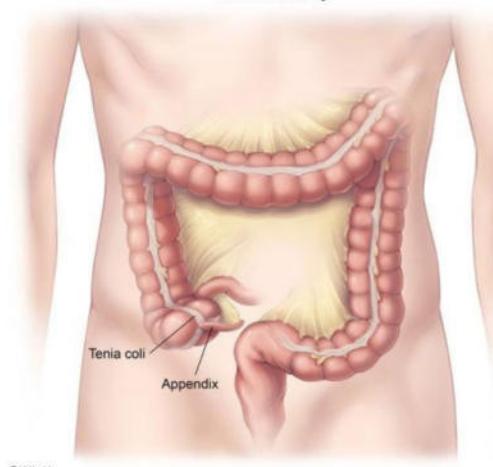


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Any condition reducing the Mesenteric fat :-

1. Rapid weight loss
2. Burns
3. Lordosis
4. Surgical correction of Scoliosis (this procedure lengthens the spine and reduces the mobility of SMA)

Colon anatomy



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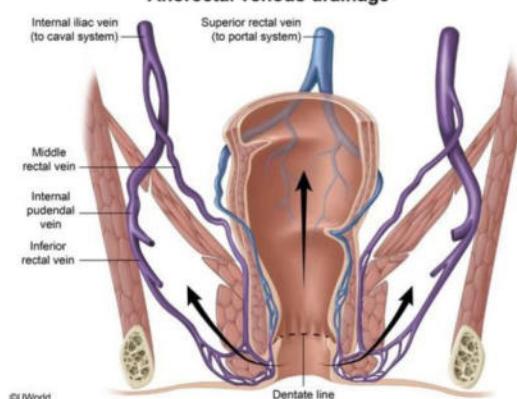
Tenia Coli is the Colonic counterpart of the Muscularis Externa of the rest of the GI Tract (in its function).

It originates from the rectum and travels along the entire length of the colon (longitudinally), as 3 separate Smooth Muscle Ribbons.

It converges at the root of the appendix, hence helping to identify the appendix (during its removal)

Tenia Coli forms the characteristic Haustra of the Large Intestine.

Anorectal venous drainage



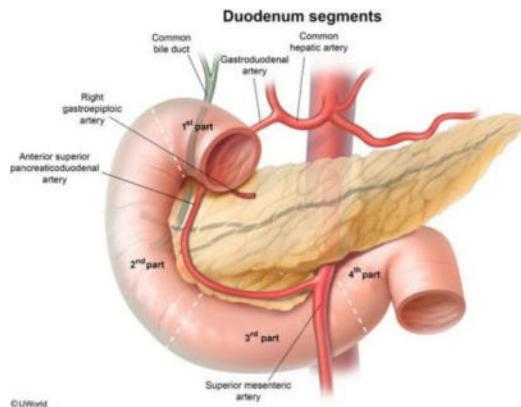
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Above the Dentate Line – Internal Hemorrhoids are painless due to Autonomic Nerve Supply.

Below – Somatic (via Internal Pudendal Nerve). hence, Painful.

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DUODENUM consists of 4 Parts :-

1st Part – only Intra- Peritoneal portion, @ L1, common location of Peptic Ulcers which are rarely Malignant, BUT may perforate the Gastroduodenal Artery (anterior ones).

2nd Part – descends from L1 to L3, in close association with Head of Pancreas. Contains opening of CBD & ampula of Vater.

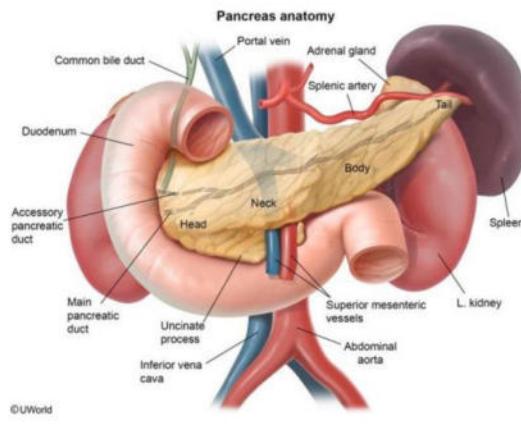
3rd Part – Horizontally @ L3, under the Superior Mesenteric Vessels and over Abdominal Aorta and IVC.

Common site of Gastrinoma caused Ulcers.

4th Part – Upwards @ L2, becomes Jejunum beyond Ligament of Treitz.

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PANCREAS is a Retro-Peritoneal organ even though its an endoderm derived organ (except for the Tail)

Lies @ the level of L2 Vertebrae.

HEAD – lies in the curve of the duodenum (Splenic Vein connects with the SMV to form PORTAL Vein)

UNCINATE PROCESS – overlies the SMA

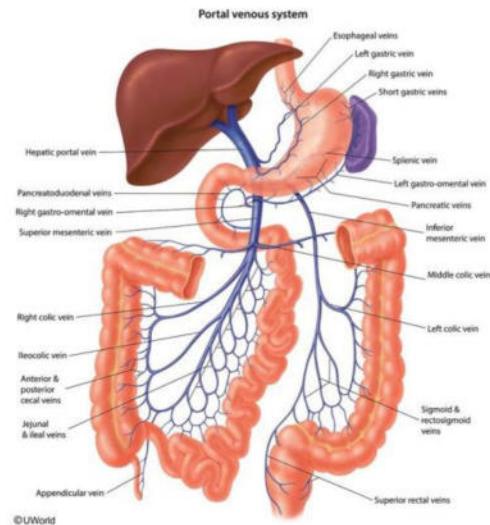
NECK – connects the body with the Head and overlies the SUPERIOR MESENTERIC VESSELS

BODY – lies over the : Left Adrenal Gland, Kidney, Aorta, Left Renal Vessels

TAIL – lies in the SPLENO–RENAL LIGAMENT.

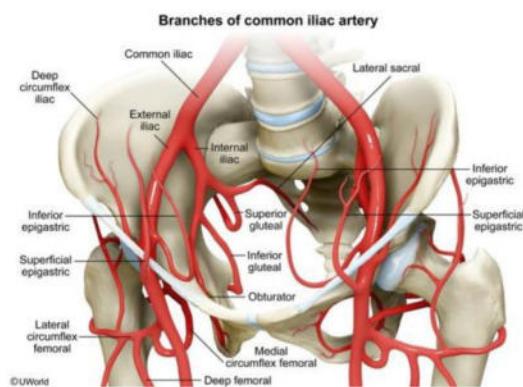
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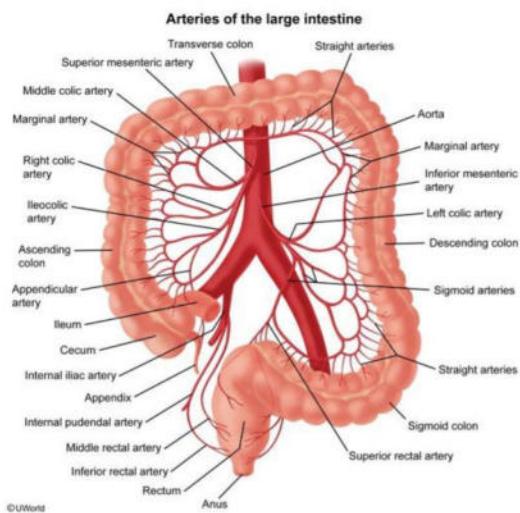
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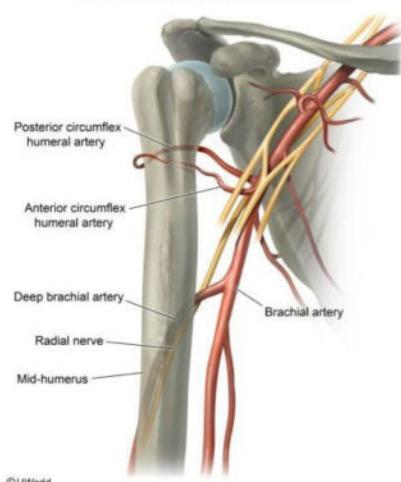
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### Deep brachial artery & radial nerve



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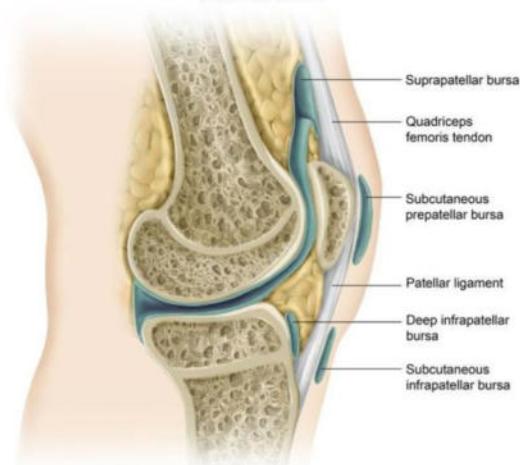
### Medial knee & pes anserinus



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## Lateral knee

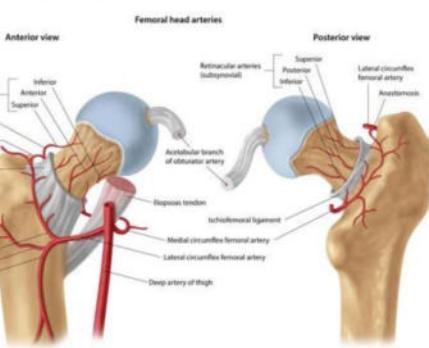


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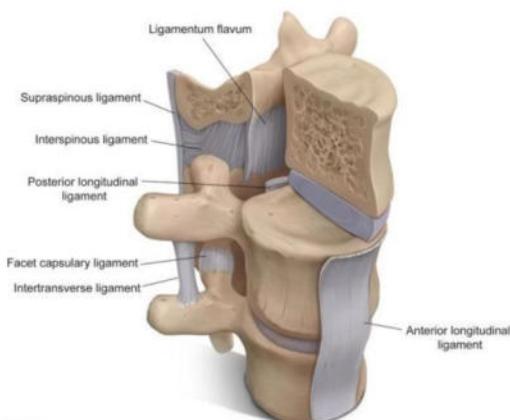
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### Vertebral ligaments



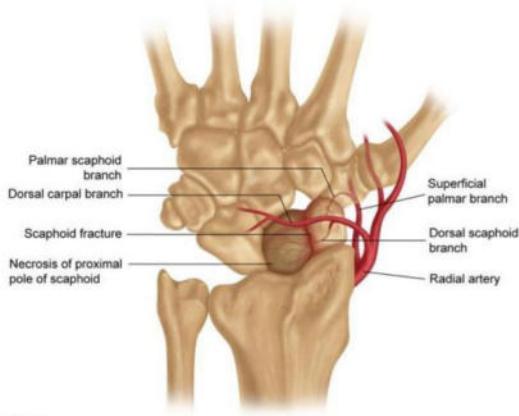
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### Scaphoid avascular necrosis



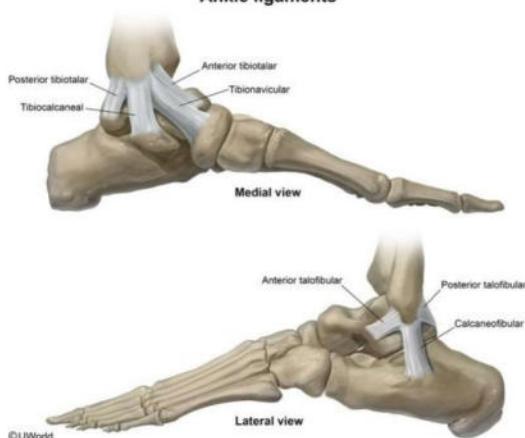
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#### Ankle ligaments



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#### Normal



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#### Common peroneal neuropathy



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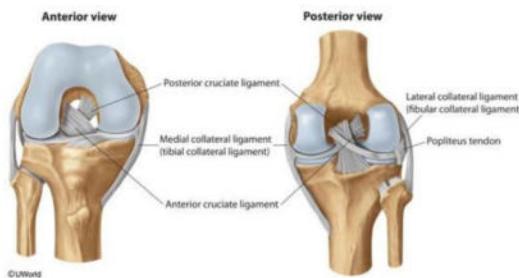
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Lower extremity nerve	Nerve roots	Cause of injury	Sensory deficit	Motor deficit
Oturator	L2-L4	Intrinsic (eg. pelvic surgery)		Thigh adduction
Femoral	L2-L4	Pelvic fracture or mass involving ilopsoas/rectus muscle (eg. hematoma or abscess)		Flexion of thigh, extension of leg
Common peroneal	L4-S2	Fibula neck fracture or nerve compression at fibular neck		Foot eversion, dorsiflexion, toe extension
Tibial	L4-S3	Trauma to the knee, tarsal tunnel syndrome		Foot inversion, plantar flexion & toe flexion
Superior gluteal	L4-S1	Intrinsic (eg. posterior hip dislocation or buttocks injection)	None	Thigh abduction
Inferior gluteal	L5-S2	Intrinsic (eg. posterior hip dislocation or buttocks injection)	None	Thigh extension

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### Tests for anterior cruciate ligament tear

#### Anterior drawer test



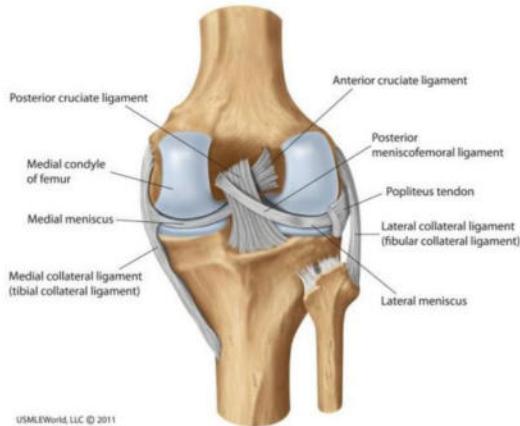
#### Lachman test



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### Knee: posterior view



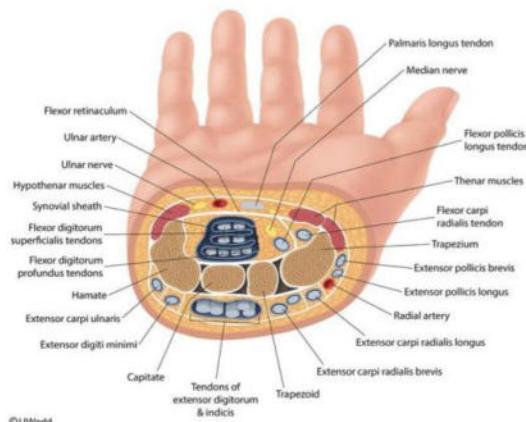
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#### Transverse cross section of wrist & carpal tunnel



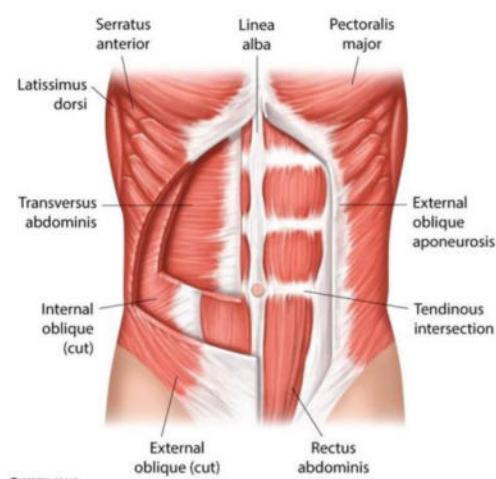
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#### Abdominal wall musculature



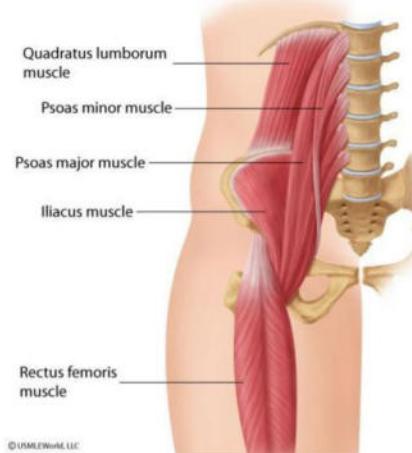
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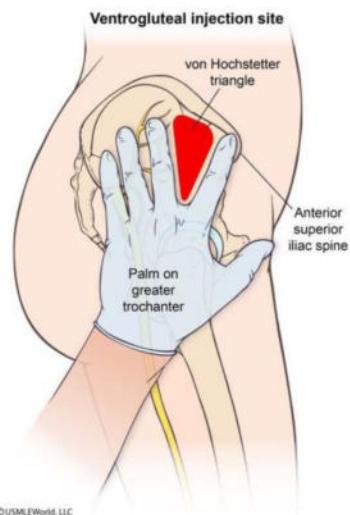
## Muscles of the hip



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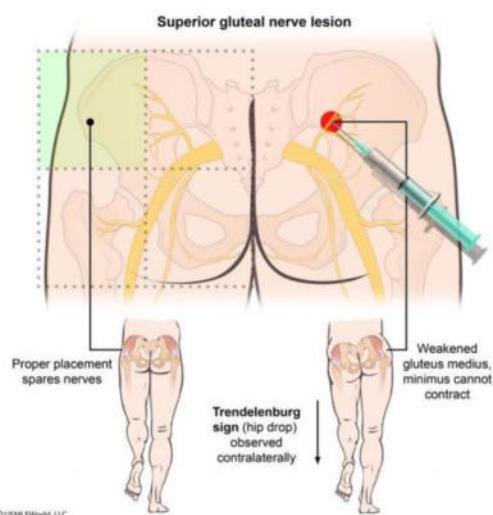
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### Anatomic snuffbox



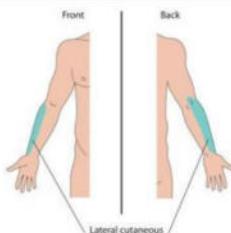
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#### Important nerves in the arm

Nerve	Motor function	Region of sensory loss with neuropathy
Musculocutaneous nerve	Flexion of arm at elbow; supination of forearm	 Front Back Lateral cutaneous nerve of forearm

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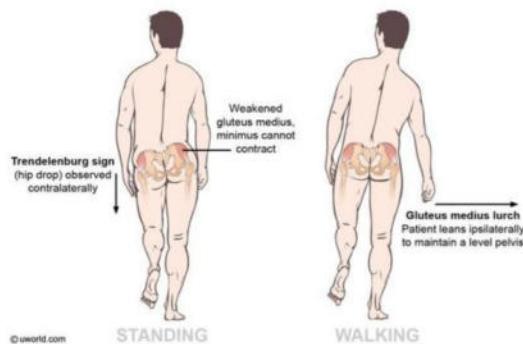


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### Superior gluteal nerve injury



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Nerve	Motor function	Region of sensory loss with neuropathy
Ulnar nerve	Finger abduction & adduction other than thumb; thumb adduction; flexion of digits 4 & 5; wrist flexion & adduction	

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#### Median nerve

Motor function	Cutaneous innervation
Thumb flexion & opposition; flexion of digits 2 & 3; wrist flexion & abduction; forearm pronation	

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#### Important nerves in the arm

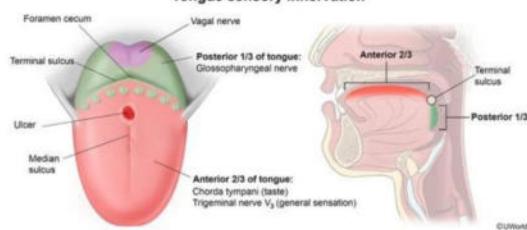
Nerve	Motor function	Region of sensory loss with neuropathy
Radial nerve	Extension at all arm, wrist, & finger joints below the shoulder; forearm supination; thumb abduction in plane of palm;	

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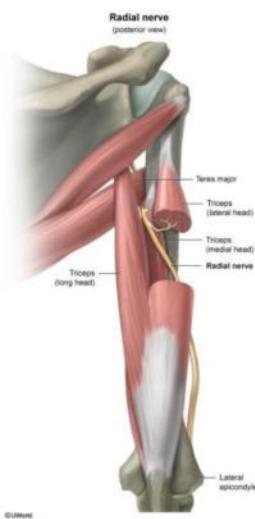
#### Tongue sensory innervation



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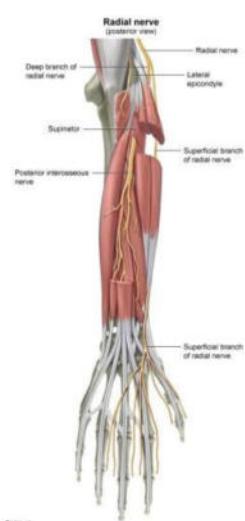
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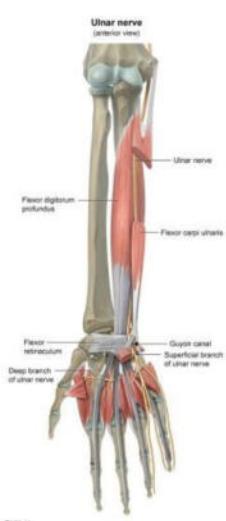
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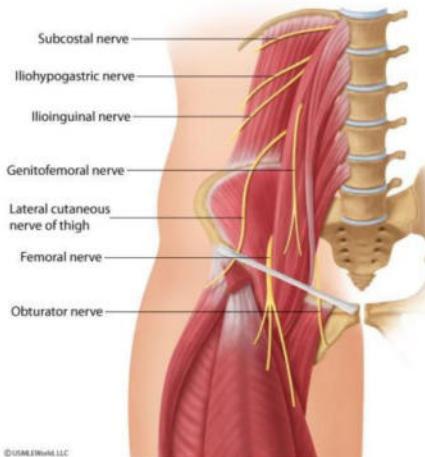
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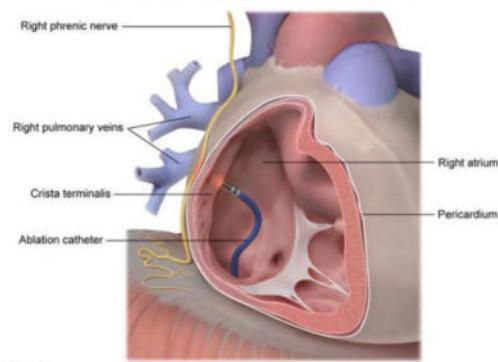
Major nerves of the lumbar plexus



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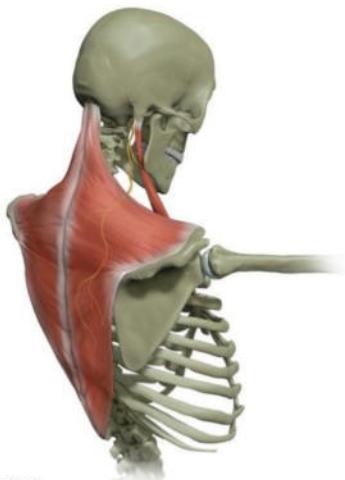
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Phrenic nerve injury during catheter ablation



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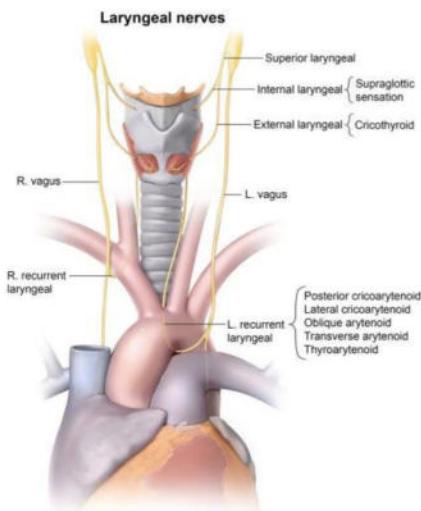
Accessory nerve = may be damaged during neck nodal dissection

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Laryngeal nerves



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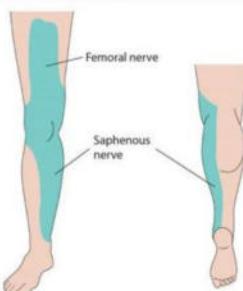
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Femoral nerve

Motor function

Cutaneous innervation

Leg flexion at the hip,  
leg extension at the knee



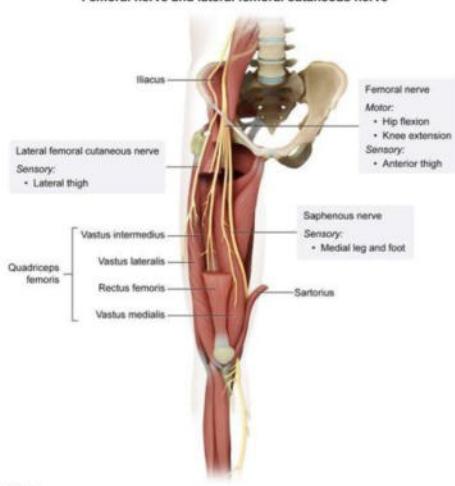
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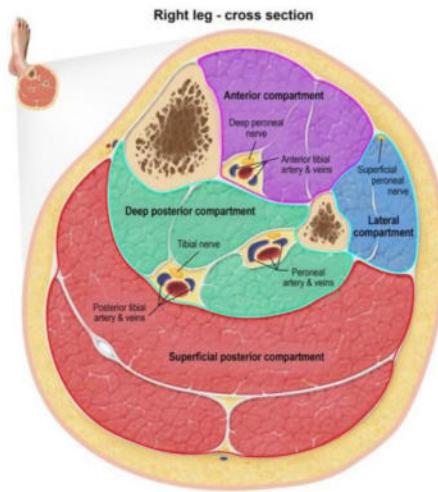
### Femoral nerve and lateral femoral cutaneous nerve



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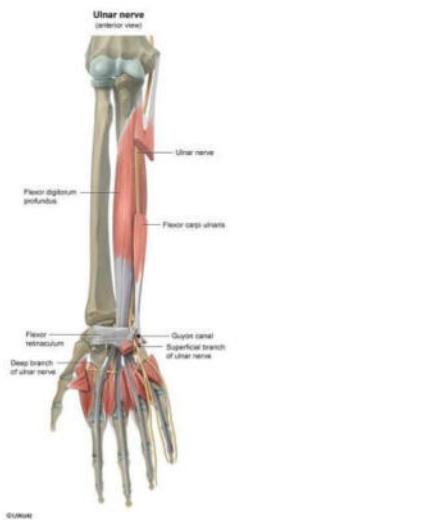
#### Obturator nerve

Nerve	Motor function	Cutaneous innervation
Obturator nerve	Adduction of the thigh	The diagram shows the left leg with a teal-colored area on the medial side of the thigh, just above the knee, representing the cutaneous innervation of the obturator nerve.

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Classic hand poses in radial, median, & ulnar nerve lesions

Sensory loss     Atrophy

Ulnar claw (ulnar palsy)



Preacher's hand (median palsy)



Simian hand (median & ulnar palsy)



Wrist drop (radial palsy)



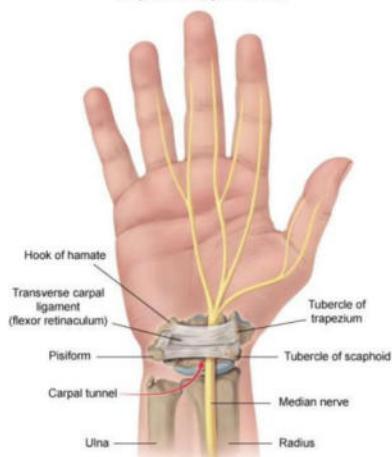
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Carpal tunnel, palmar view



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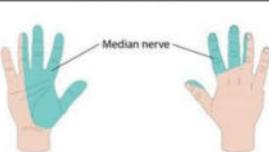
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## Median nerve

### Motor function

Thumb flexion & opposition,  
flexion of digits 2 & 3, wrist flexion  
& abduction, forearm pronation



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### Cutaneous innervation

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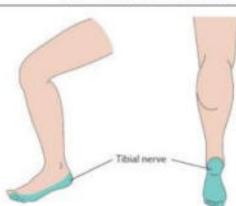
Nerve

Motor function

Region of sensory loss with neuropathy

Tibial nerve:

Foot plantar flexion &  
inversion; toe flexion



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### Important nerves in the leg

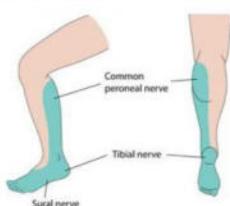
Nerve

Motor function

Region of sensory loss with neuropathy

Sciatic nerve

Leg flexion at the knee  
(see also tibial &  
peroneal nerves)



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### Important nerves in the leg

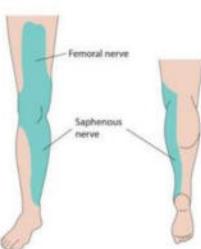
Nerve

Motor function

Region of sensory loss with neuropathy

Femoral nerve

Leg flexion at the hip,  
leg extension at the knee



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### Important nerves in the leg

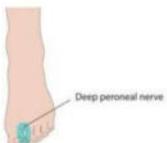
Nerve

Motor function

Region of sensory loss with neuropathy

Deep peroneal  
nerve

Foot dorsiflexion,  
toe extension

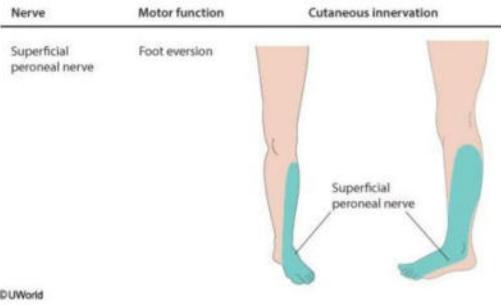


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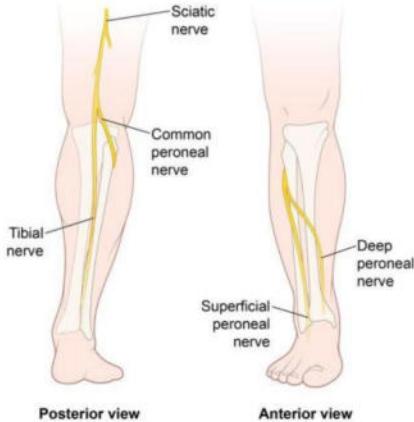
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### Common peroneal nerve anatomy



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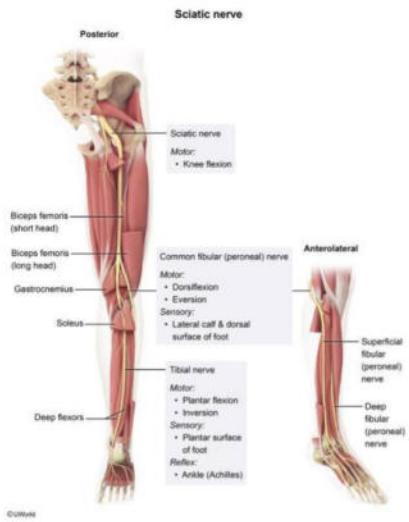
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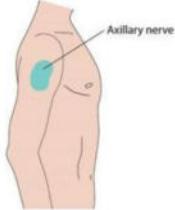
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### Axillary nerve

**Motor function**      **Cutaneous innervation**

Abduction of arm at shoulder beyond first 15 degrees

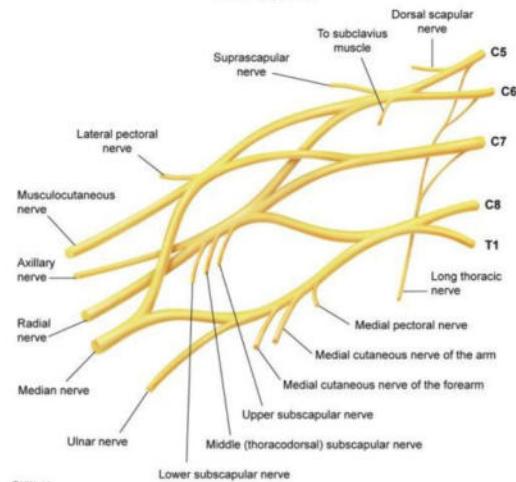


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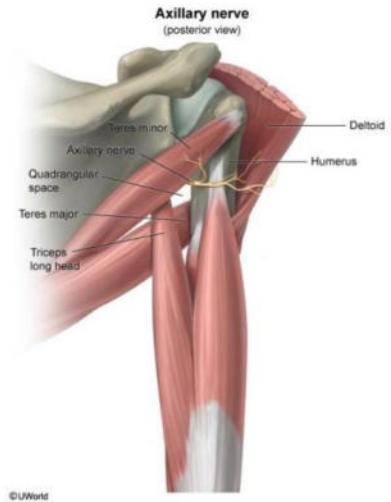
### Brachial plexus



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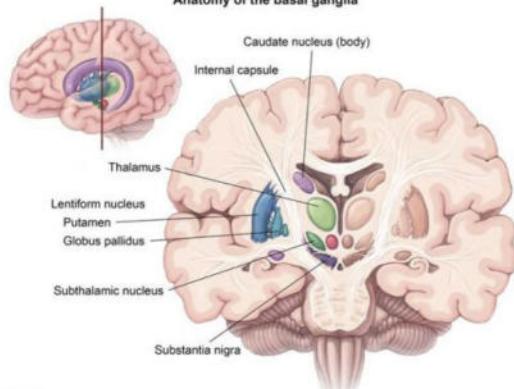


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Anatomy of the basal ganglia

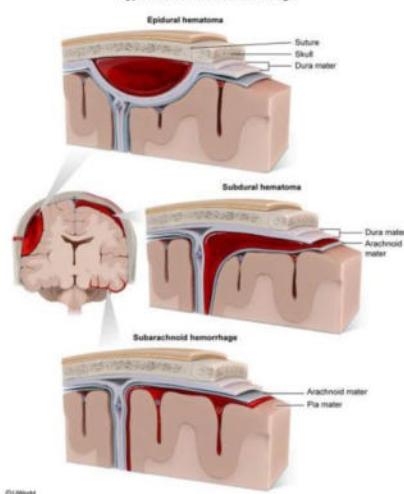


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Types of intracranial hemorrhage

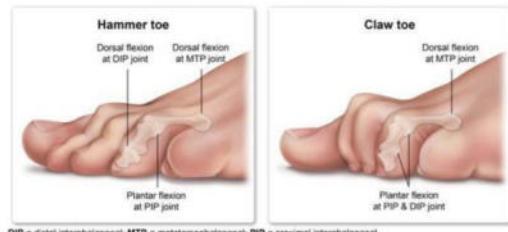


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### Hammer & claw toe deformities



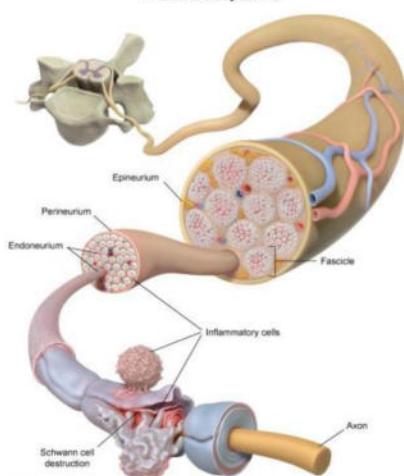
DIP = distal interphalangeal; MTP = metatarsophalangeal; PIP = proximal interphalangeal.  
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#### Guillain-Barré syndrome

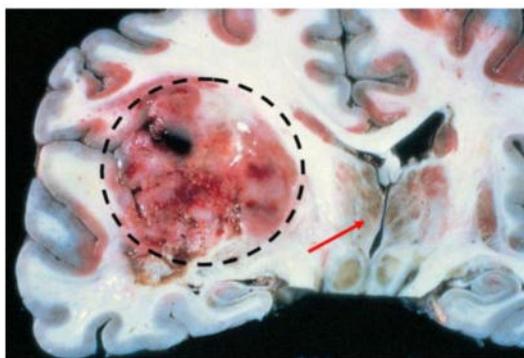


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#### Glioblastoma multiforme

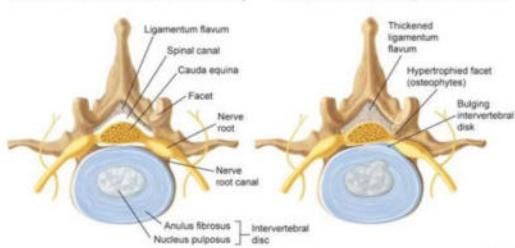
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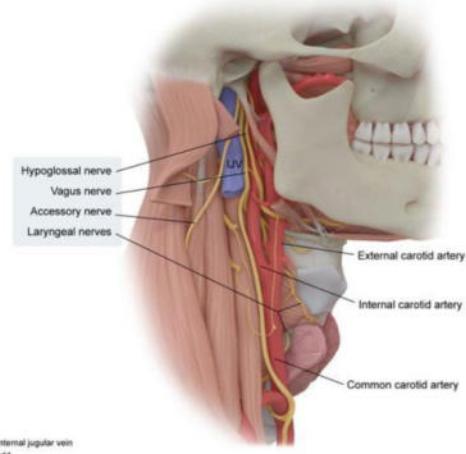
#### Lumbar vertebrae, normal anatomy

#### Lumbar vertebrae, spinal stenosis



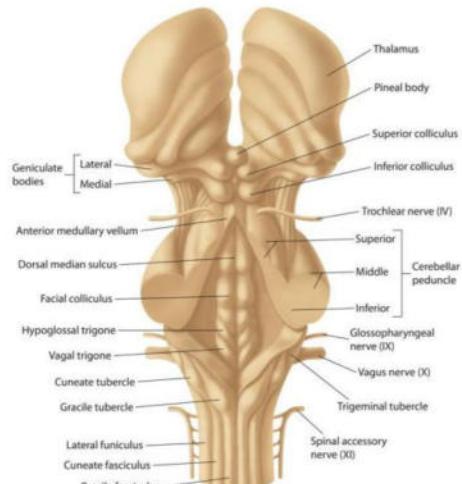
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Nerve at risk during carotid endarterectomy

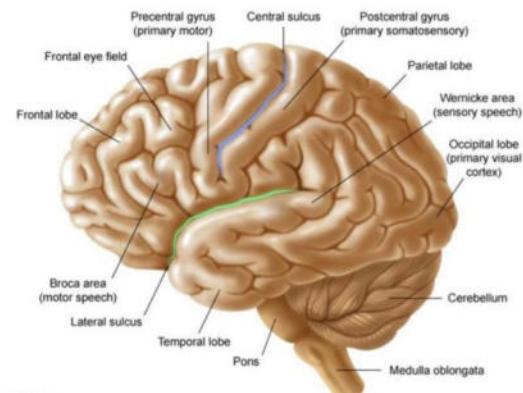


UV = internal jugular vein

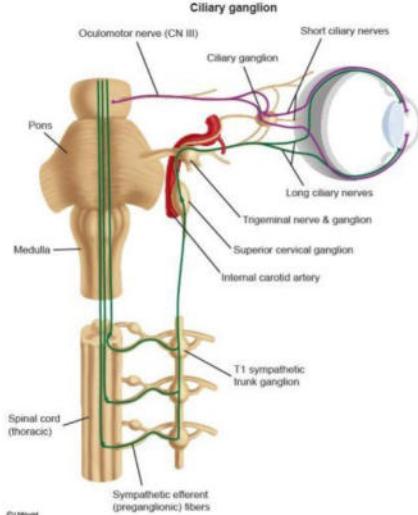
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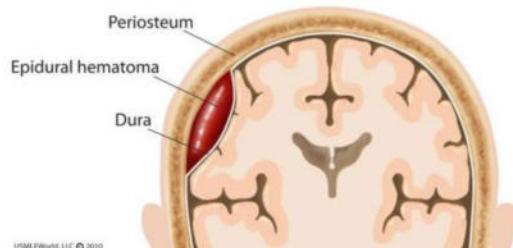


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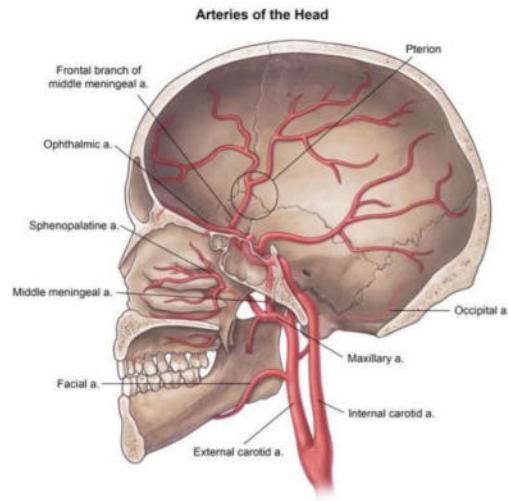
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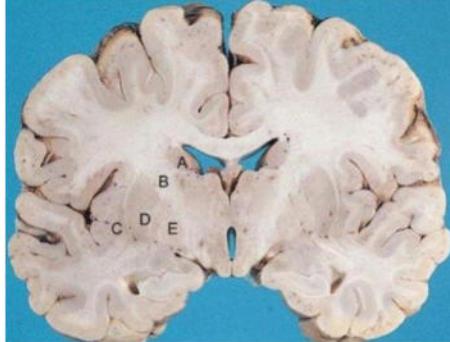
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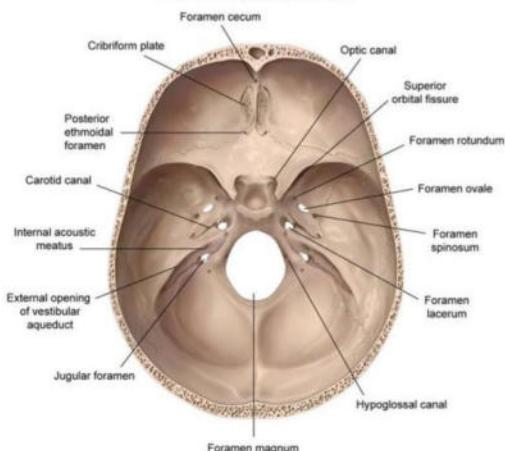
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### Foramina of the cranial base



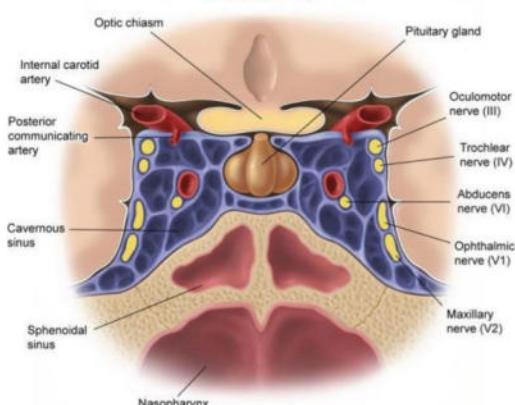
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### Cavernous sinus



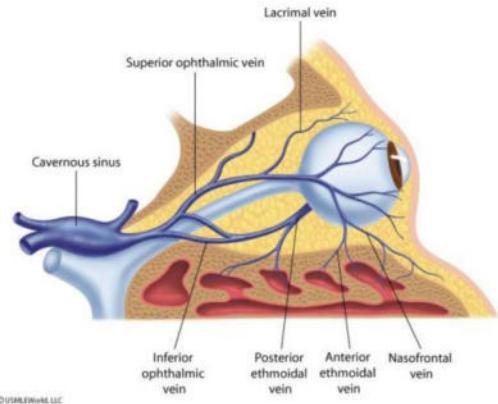
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The valveless ophthalmic venous system

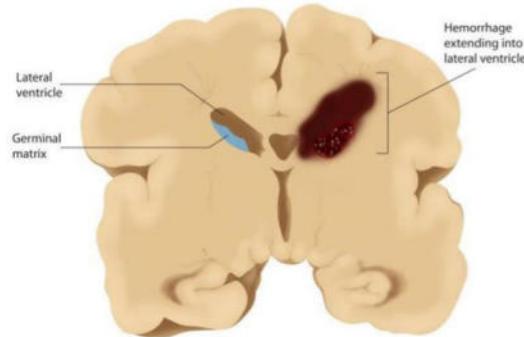


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Germinal matrix hemorrhage



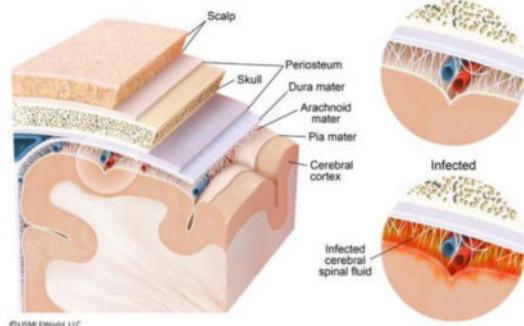
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Meninges



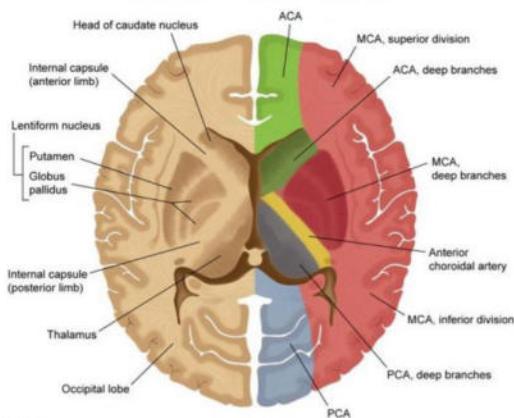
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### Blood supply to the cerebral hemispheres

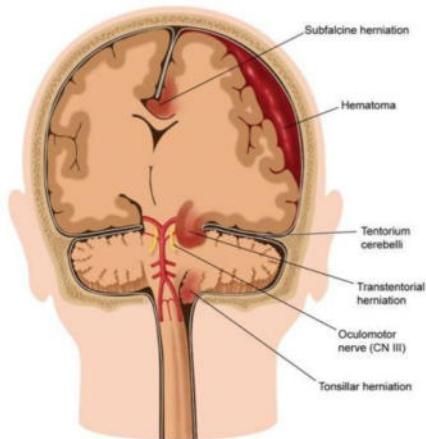


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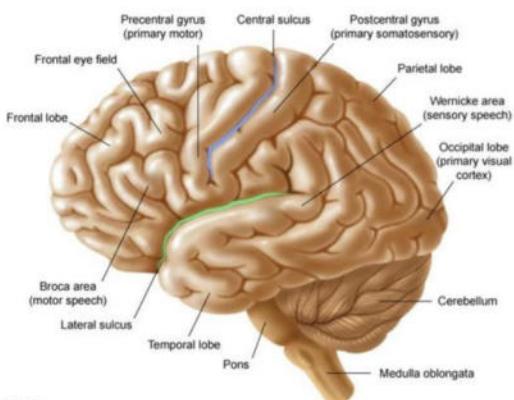
#### Major herniations of the brain



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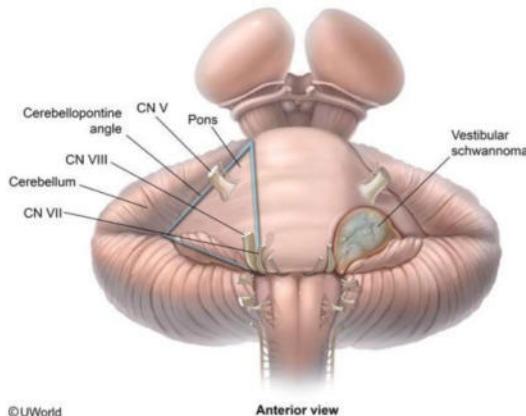


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### Cerebellopontine angle with vestibular schwannoma



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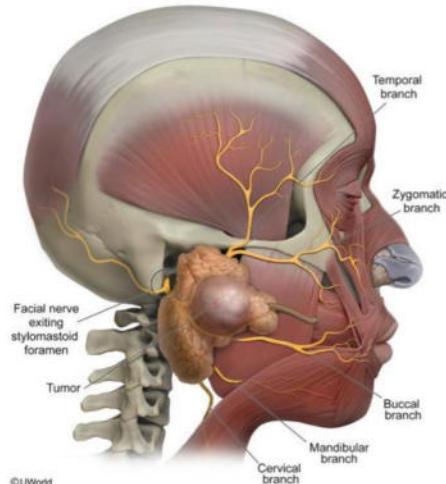
Anterior view

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Parotid tumor compressing facial nerve



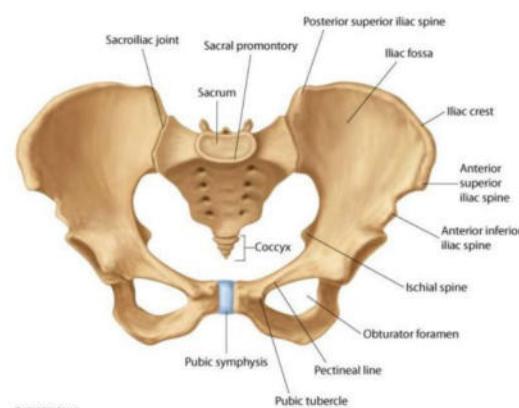
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Female pelvis

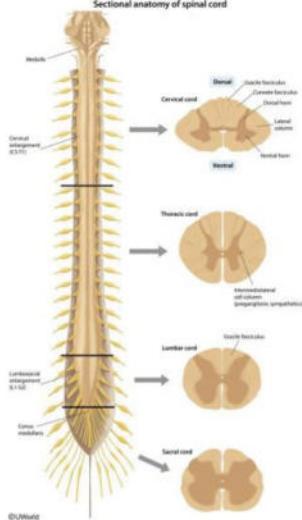


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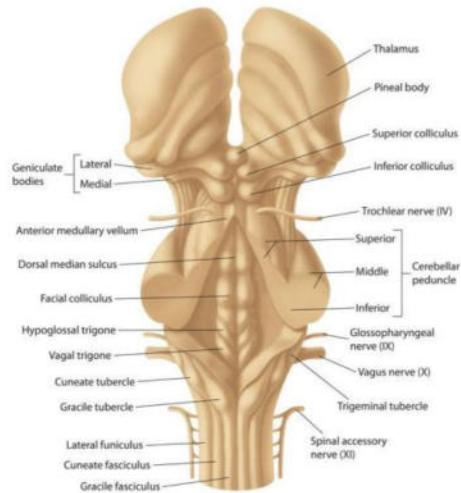
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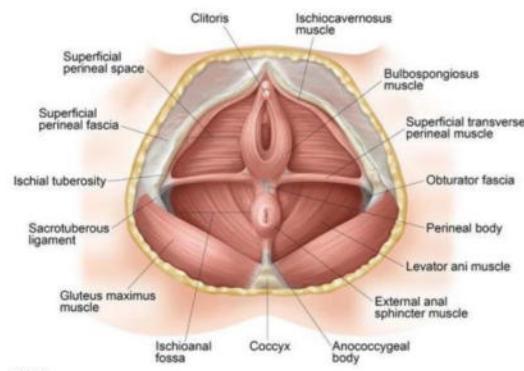


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### Pelvic floor muscles

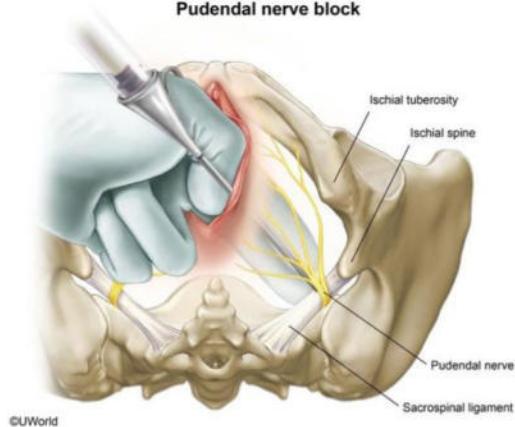


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## Pudendal nerve block



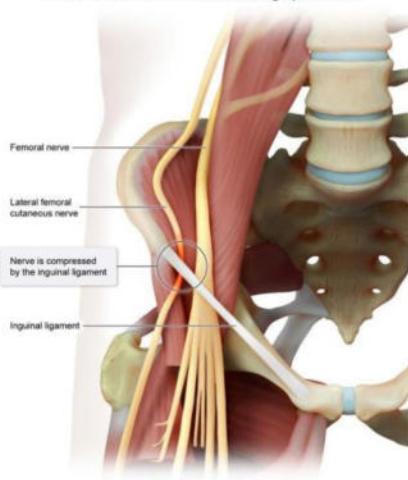
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Lateral femoral cutaneous nerve & meralgia paresthetica



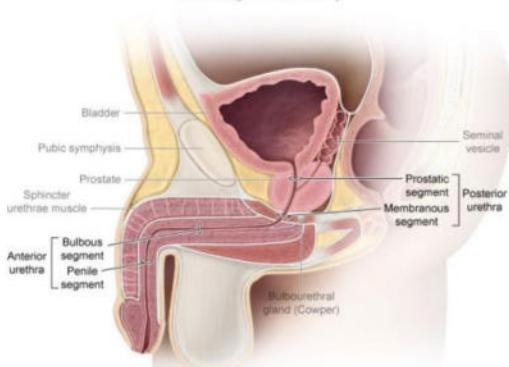
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Male urogenital anatomy



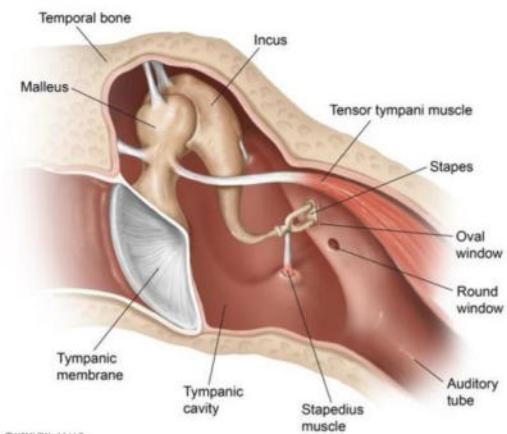
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## Middle ear anatomy



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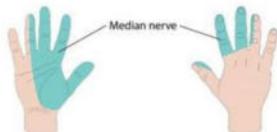
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### Median nerve

#### Motor function

#### Cutaneous innervation

Thumb flexion & opposition,  
flexion of digits 2 & 3, wrist flexion  
& abduction, forearm pronation



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### Classic hand poses in radial, median, & ulnar nerve lesions

Sensory loss

Atrophy

Ulnar claw (ulnar palsy)



Preacher's hand (median palsy)



Simian hand (median & ulnar palsy)



Wrist drop (radial palsy)

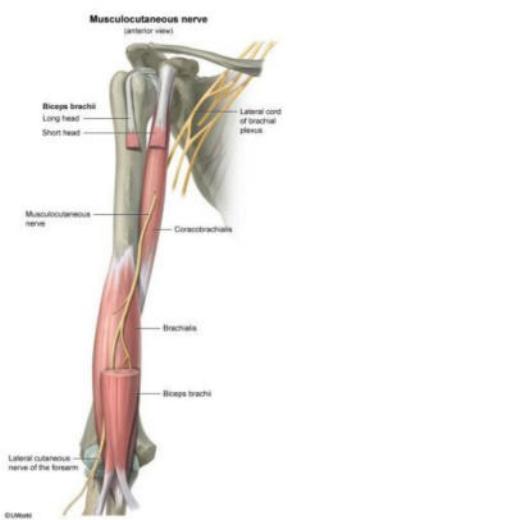


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Important nerves in the arm

Nerve	Motor function	Region of sensory loss with neuropathy
Musculocutaneous nerve	Flexion of arm at elbow; supination of forearm	<p>The diagram shows two figures of the human arm. The left figure, labeled 'Front', shows a blue shaded area on the lateral side of the forearm. The right figure, labeled 'Back', shows a blue shaded area on the lateral side of the upper arm. Both shaded areas correspond to the distribution of the Lateral cutaneous nerve of the forearm.</p>

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Important nerves in the arm

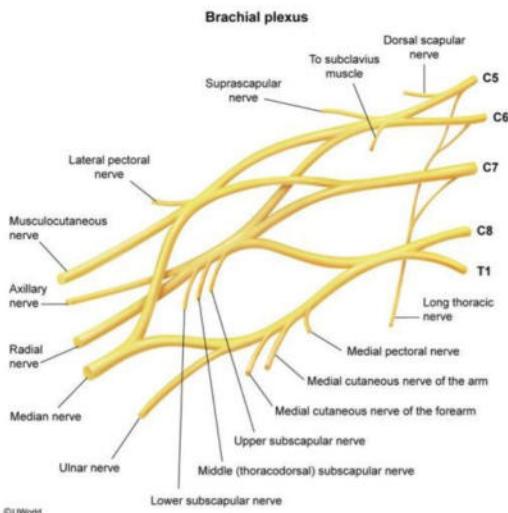
Nerve	Motor function	Region of sensory loss with neuropathy
Radial nerve	Extension at all arm, wrist, & finger joints below the shoulder; forearm supination, thumb abduction in plane of palm	<p>The diagram shows a figure of the human arm. A blue shaded area is shown on the posterior side of the upper arm (Posterior cutaneous nerve of arm). Another blue shaded area is shown on the posterior side of the forearm (Posterior cutaneous nerve of forearm). The distal part of the arm and the dorsal surface of the hand are also shaded in blue, representing the distribution of the Dorsal digital nerves.</p>

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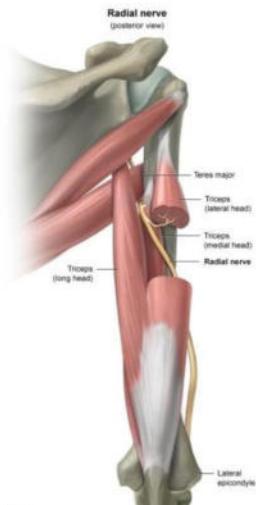
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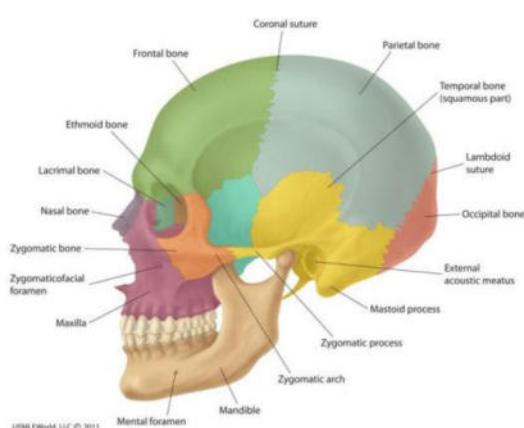


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## Skull, lateral view

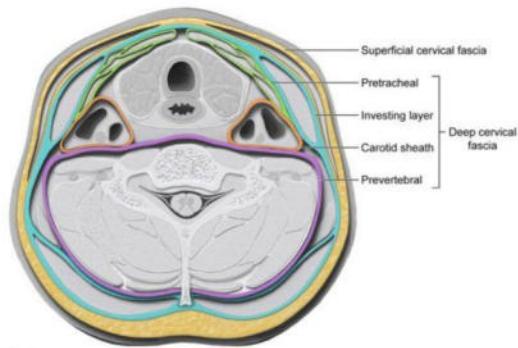


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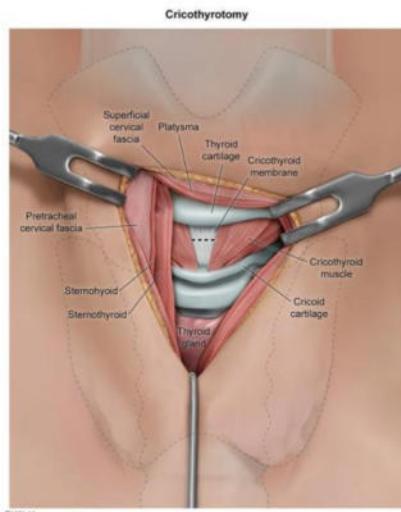
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### Fascia of the neck



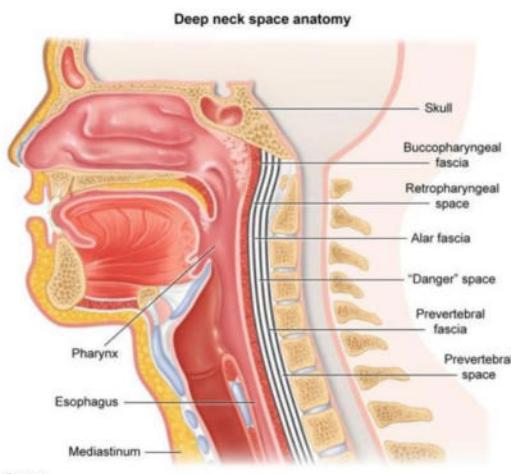
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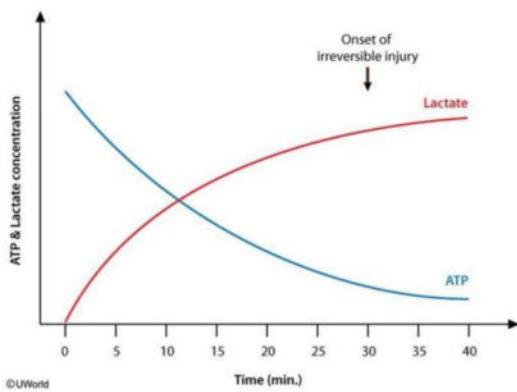
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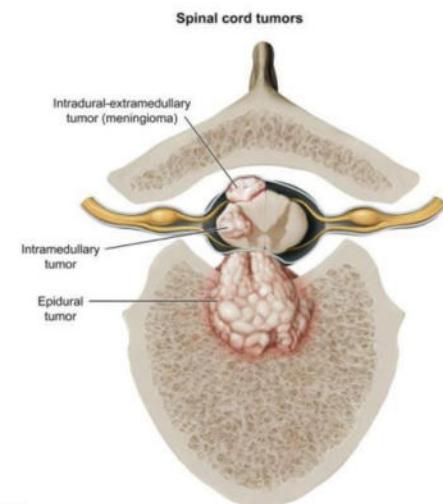
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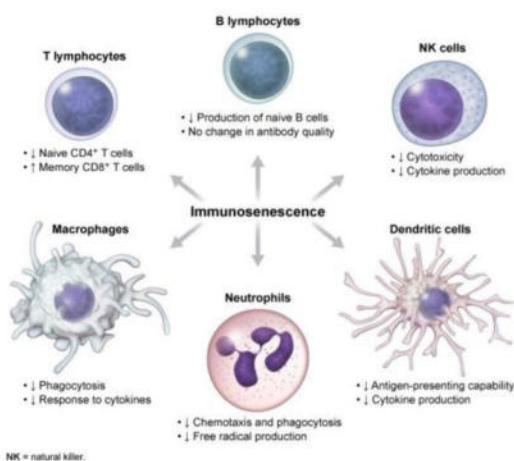
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## IMMUNOSENESCENCE

points to remember :-

due to shortening of length of telomeres in rapidly dividing cells of immune system i.e. T- and B- Lymphocytes -->

decreased production of naive cells --> reduced ability to mount  
EFFECTIVE immune response to NEW pathogens (hence, Vaccine Failure)

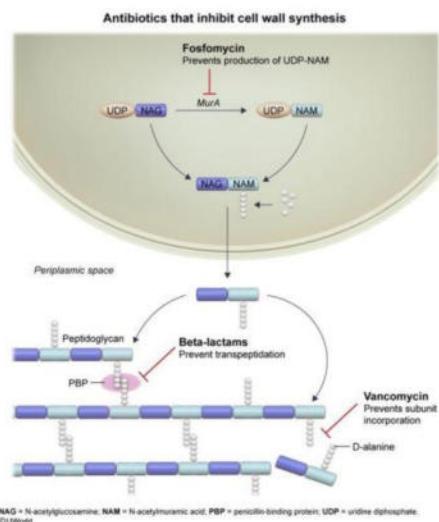
BUT

increased MEMORY T-cell function and normal Ab Quality --> intact  
ability to mount immune response to PREVIOUSLY ENCOUNTERED  
pathogens.

NEUTROPHIL --> ma changes na lidhe --> slow wound healing and  
repair.

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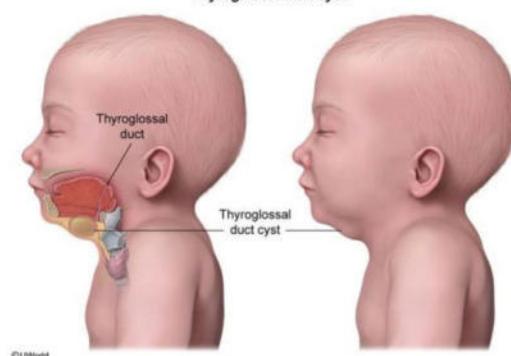


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Thyroglossal duct cyst

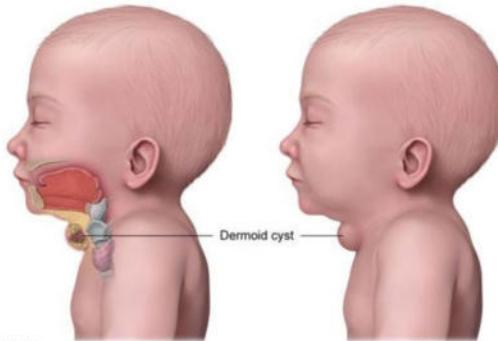


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Dermoid cyst



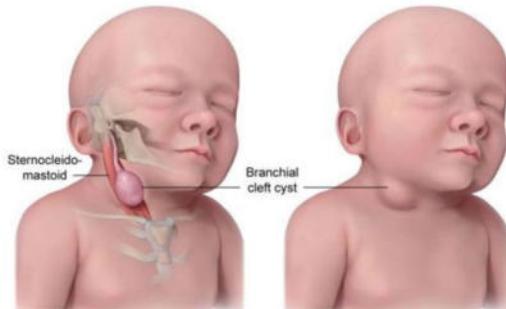
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Branchial cleft cyst



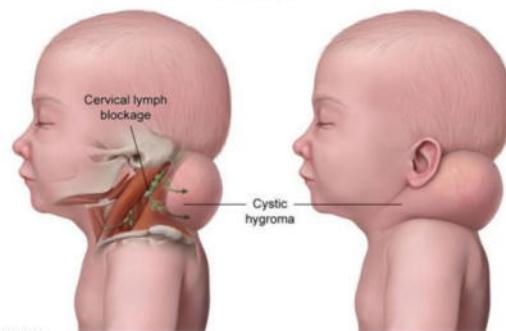
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Cystic hygroma



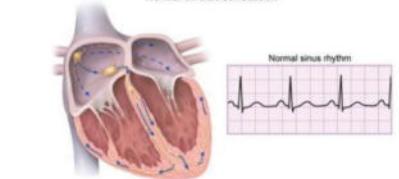
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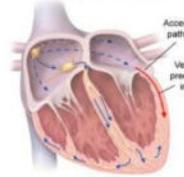
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Normal cardiac conduction



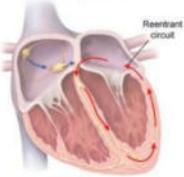
Ventricular preexcitation



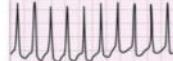
WPW pattern



WPW syndrome



Reentrant tachycardia



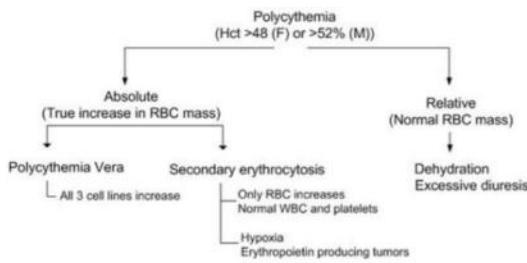
WPW = Wolff-Parkinson-White.

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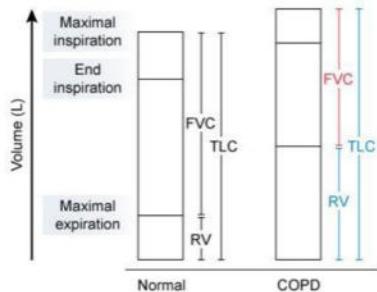
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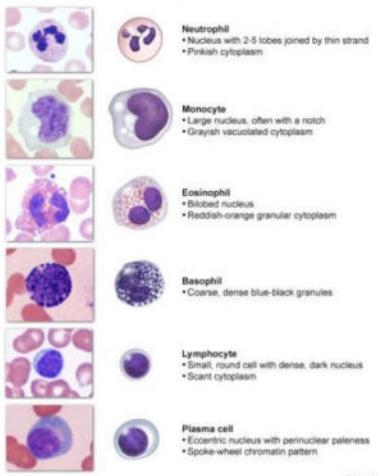
FVC = forced vital capacity, RV = residual volume, TLC = total lung capacity.  
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### Leukocytes in peripheral blood

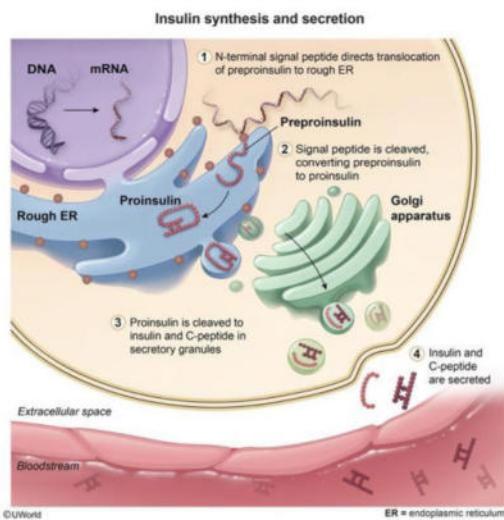


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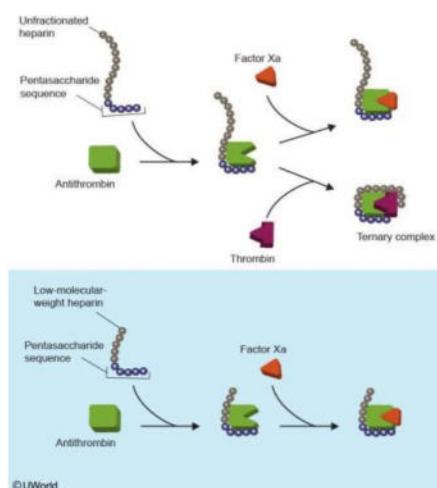


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Heparin's mechanism of action



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Only heparin has a pentasaccharide sequence long enough to allow binding to

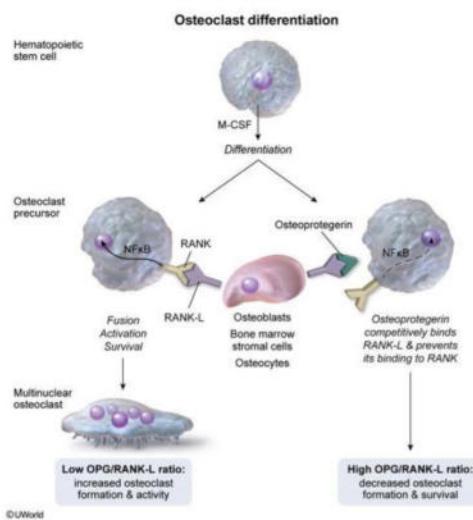
Anti-Thrombin and Thrombin together,

And hence allowing it to inactivate both factor 2 and 10.

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Bone remodelling is tightly regulated by Osteocytes (bone marrow stromal cells that are located within the lacuna–canalicular network) in conjunction with signals from

bone marrow and the bone surface.

Many tumors which spread to bone stimulate osteoclasts but doesn't inhibit osteoblasts.

BUT

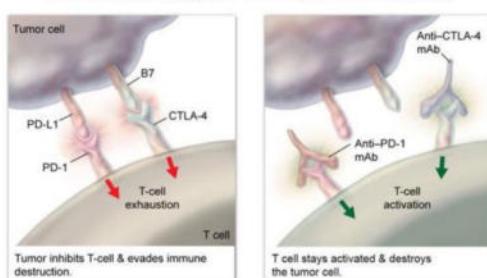
MM inc. Osteoclast + inhibit osteoblasts --> hence, purely lytic bone lesions (radiolucent regions on X-Ray, esp of Skull and Vertebrae)

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Cancer immunotherapy: anti-PD-1 & anti-CTLA-4 antibodies



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04:20

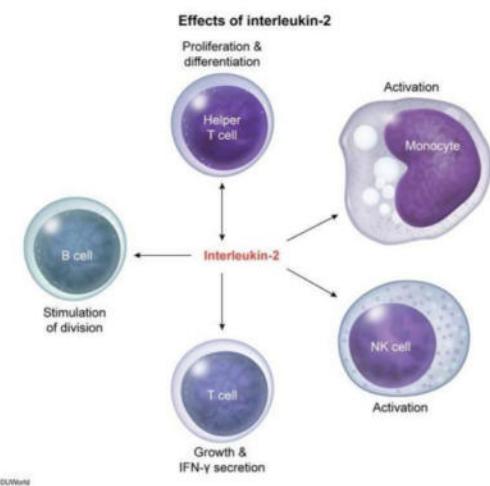
PD-1 receptor is a "checkpoint inhibitor" that downregulates CD 8+ T-cell response.

Neoplastic cells often misuse this and overexpress PD-1 Ligand that binds to it.

U

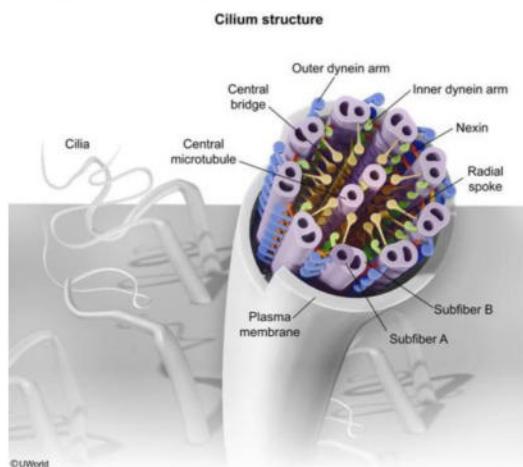
## UWORLD IMAGES

04:21



## UWORLD IMAGES

04:21



## UWORLD IMAGES

04:21

when oral polio vaccine given --> direct mucosal antigen stimulation –  
->

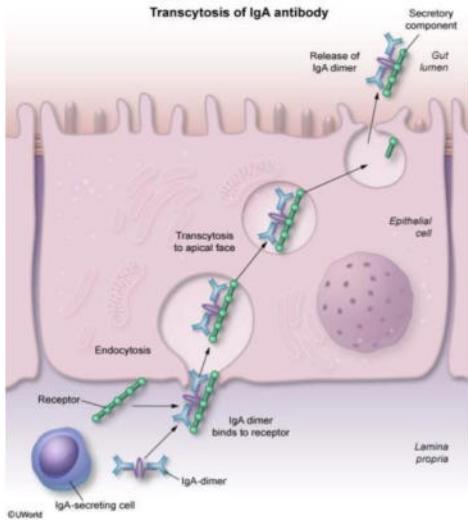
greater secretion of luminal IgA

vs

i.m / killed salk vaccine.

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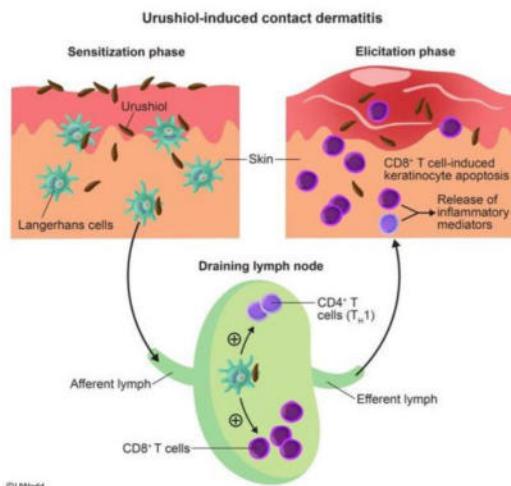
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Poison Ivy Dermatitis.

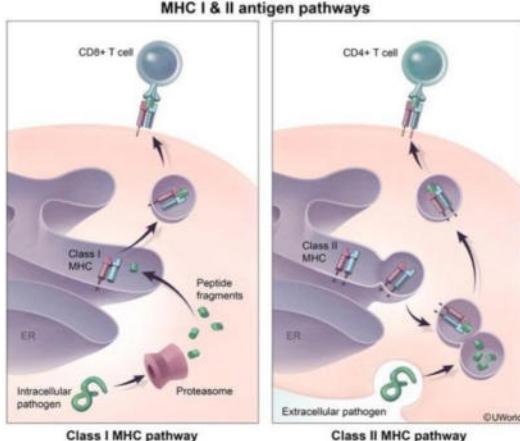
h/o working or travel to wooded areas.

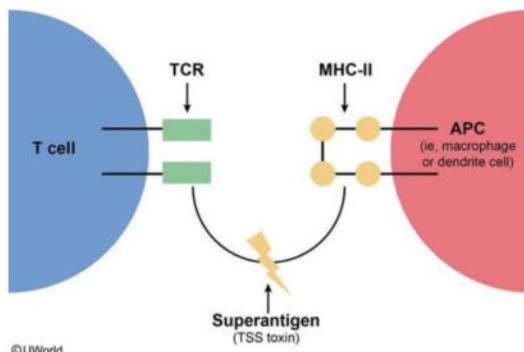
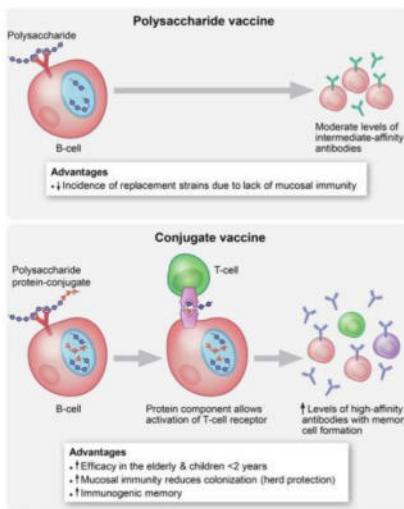
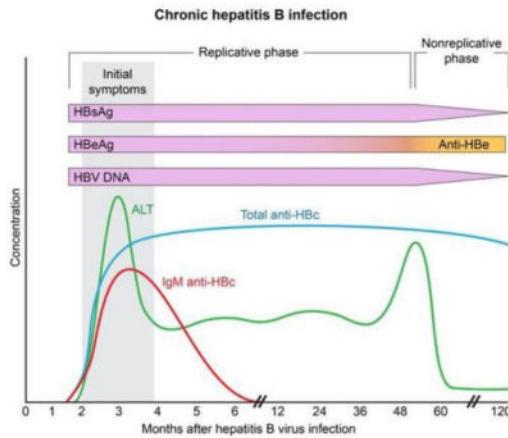
Type 4 HST

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04:22





abnormal interaction (with MHC) on APC (macrophage) and (variable chain of TCR) on T-Lymphocytes

by superAg (TSST, TSLT) -->

excess (>20%) instead of usual <1% T-Lymphocytes activation -->

secretion of

1. (macrophage) IL-1, TNF alpha --> fever and acute Inflammation.

2. (T-Cell) IL-2 which activates all types of T-cells

resulting in Toxic Shock Syndrome.

fever, vomiting, diarrhea, myalgia, hypotension, end-organ hypoperfusion and

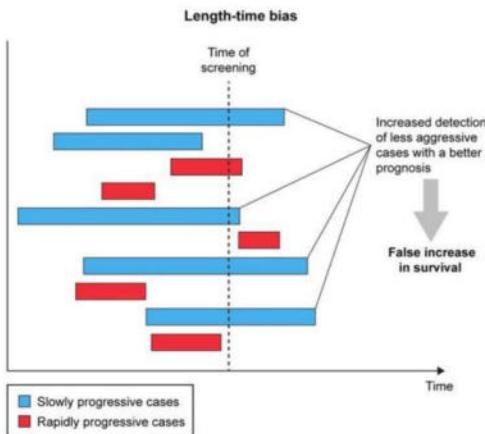
multi-system dysfunction

(clue in elevated AST, ALT and S. Creatinine)

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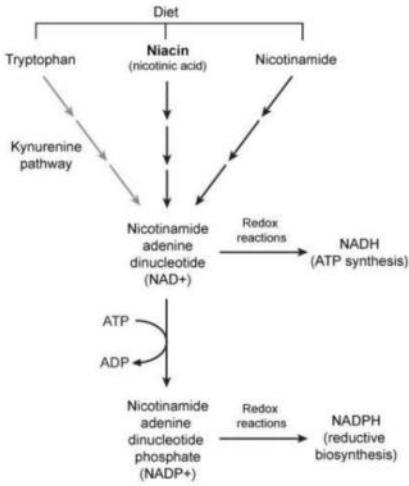
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### Niacin metabolism

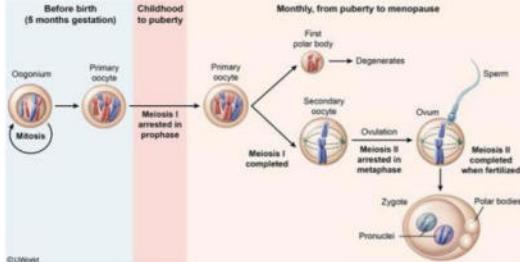


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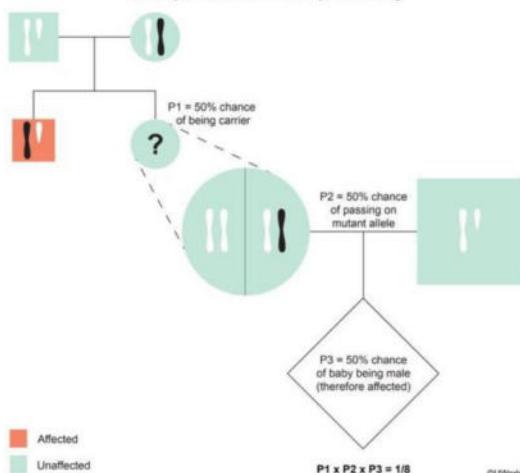


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Hemophilia inheritance probability

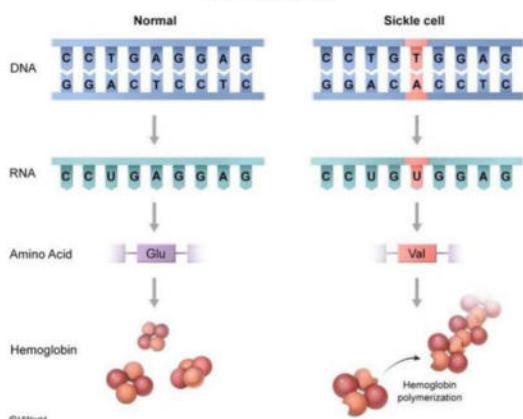


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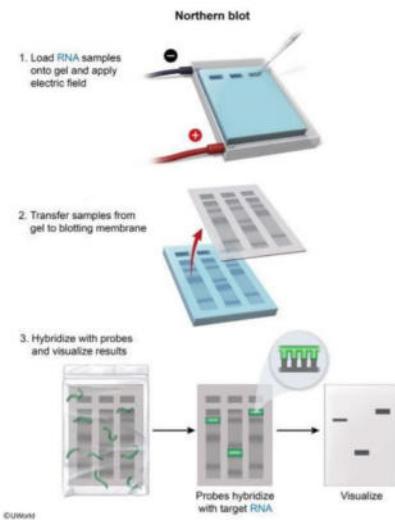
Sickle cell disease



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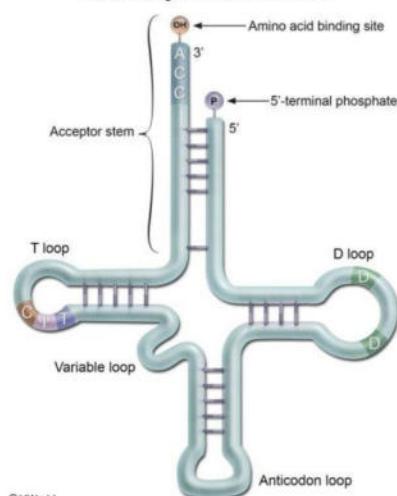
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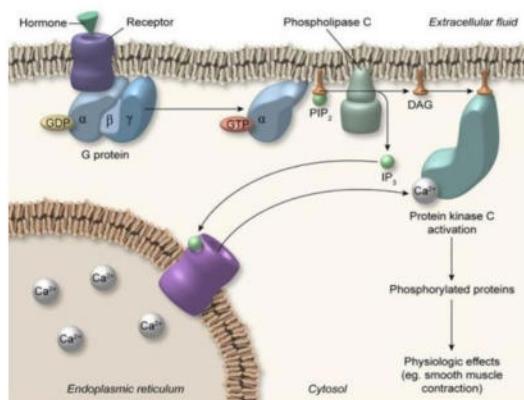
### Secondary structure of tRNA



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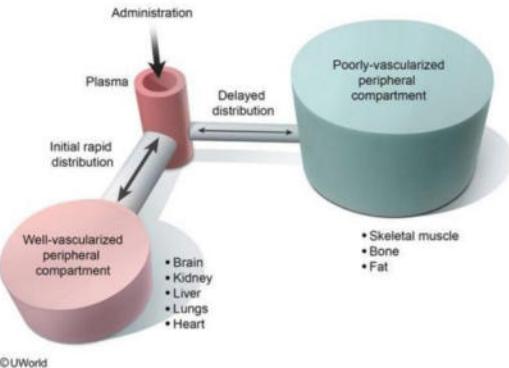
### Phosphatidylinositol 2nd messenger system



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## Multi-compartment drug metabolism



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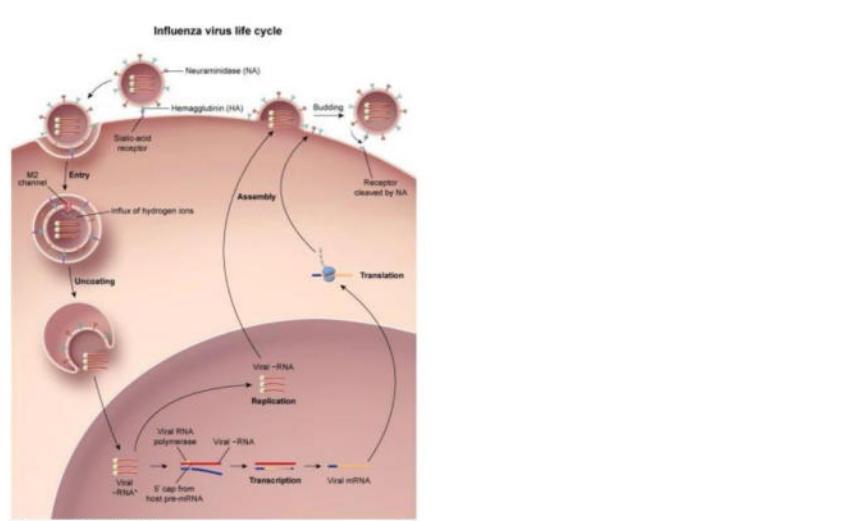
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Hence, highly lipophilic anesthetic drugs have short duration of action.

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\*Only 3 of the 8 viral RNA segments depicted.

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The tissue tropism of viruses is primarily mediated by viral "Surface Glycoproteins" that bind to specific host cell receptors. eg :- Hemagglutinin and Neuraminidase

Why Antigenic Drift ?

bcz the Viral RNA-dependent RNA polymerase lacks proofreading function (similar to HCV) --> mutations during replication.

Antigenic Shift ?

genomic reassortment

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04:30

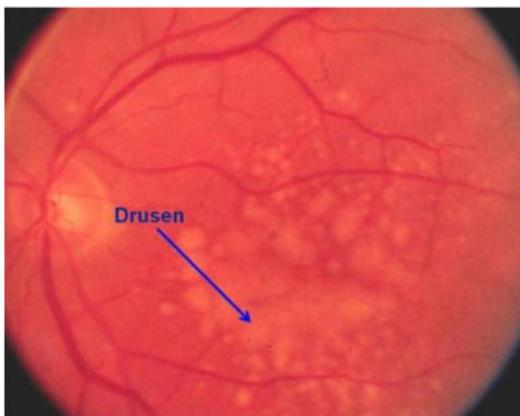
grayish-green subretinal discoloration with adjacent fluid/hemorrhage, indicative of Wet AMD – presents with acute vision loss (days to weeks) and metamorphopsia (distortion of straight lines)

Rx with anti-VEGF.

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04:30



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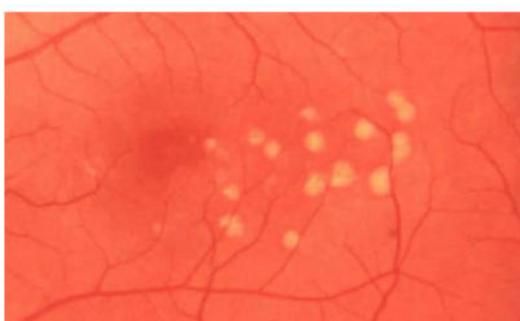
04:30

Exudative drusens – sub-retinal deposits seen in "dry" AMD

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sub-retinal Calcified drusens – seen in dry AMD

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04:31



Black arrows = retinal hemorrhage. White arrows = CMV granular retinal lesions.  
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CMV Retinitis –

pt. presents with slowly progressive blurred vision, scotoma (blind spots) or photopsia (flashing lights).

Serum testing negative (50% of the time), hence, fundoscopy used for diagnosis.

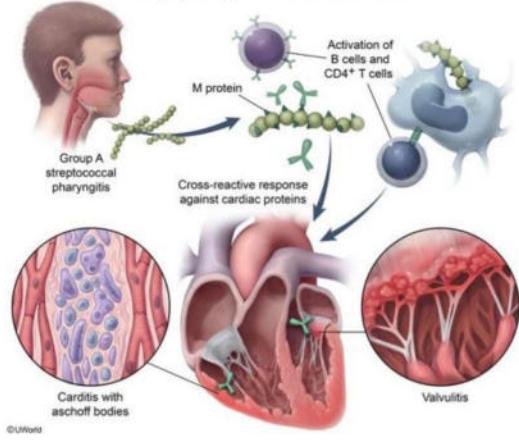
Rx --> Ganciclovir (a guanosine analogue) which is structurally similar to acyclovir, but express greater activity against CMV DNA polymerase.

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Pathophysiology of acute rheumatic fever



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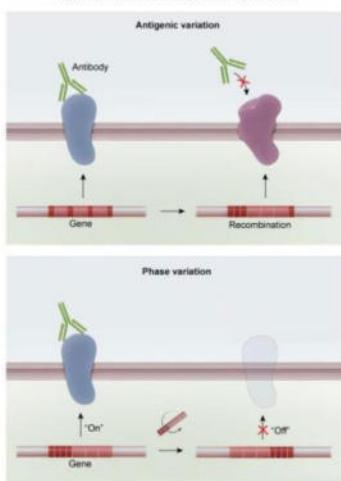
04:31

normal optic disk/retina

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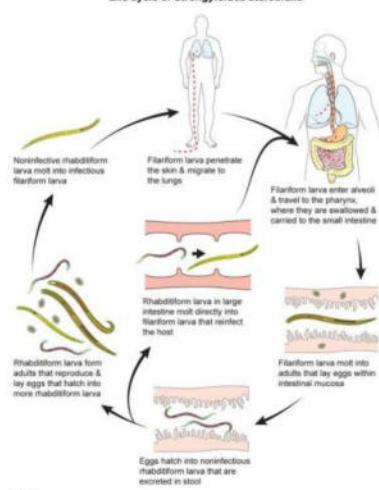
Bacterial mechanisms for immune evasion



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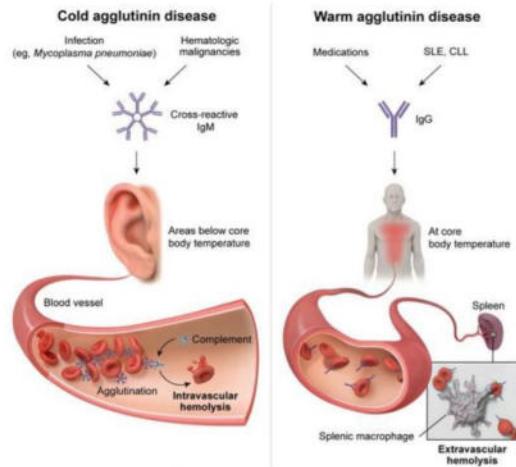
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Life cycle of *Strongyloides stercoralis*



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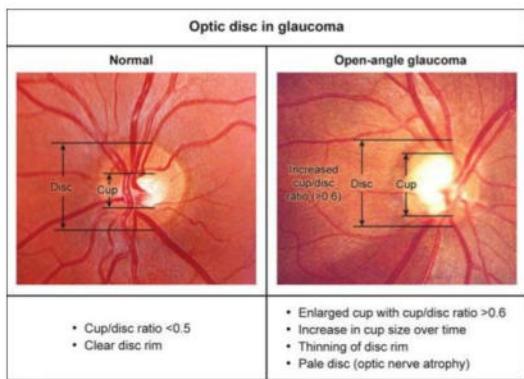
## UWORLD IMAGES



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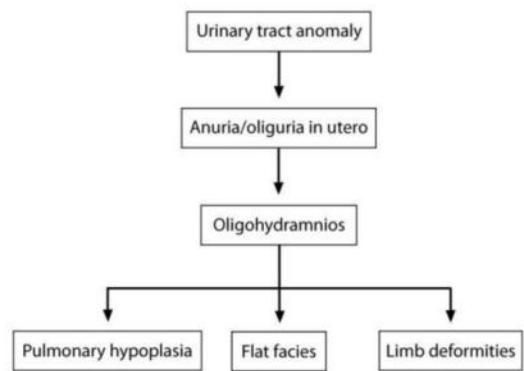


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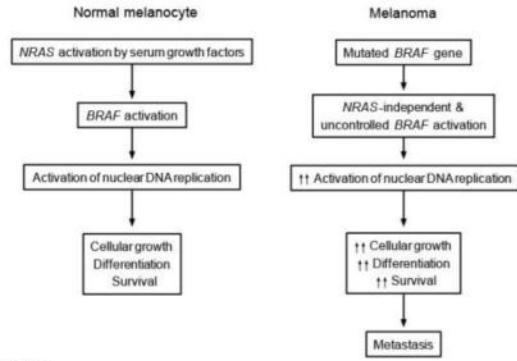
## Potter sequence



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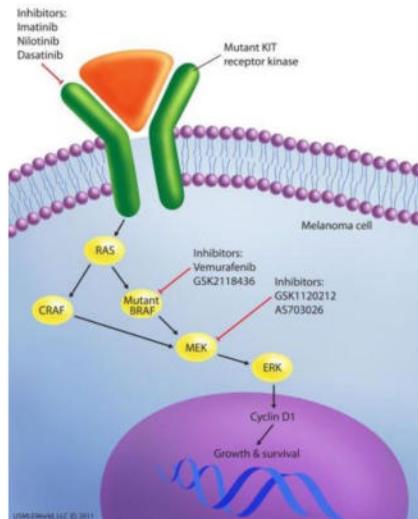
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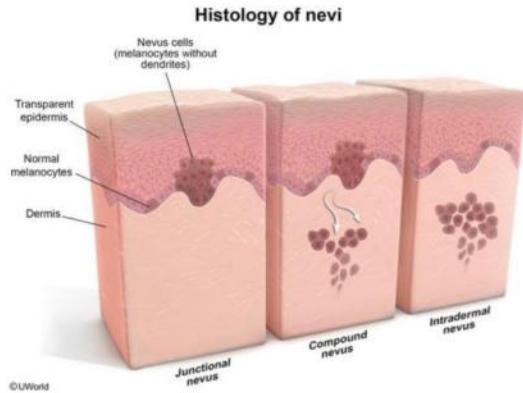
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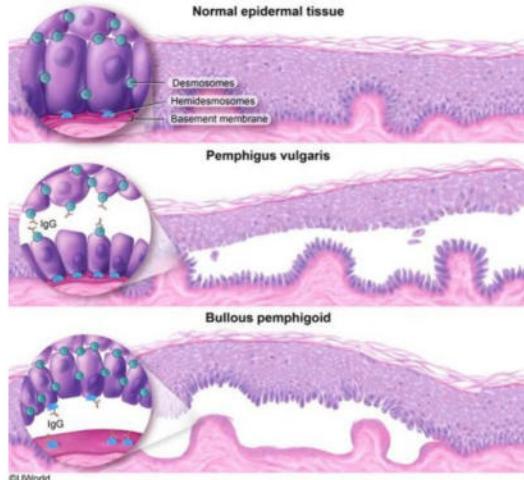
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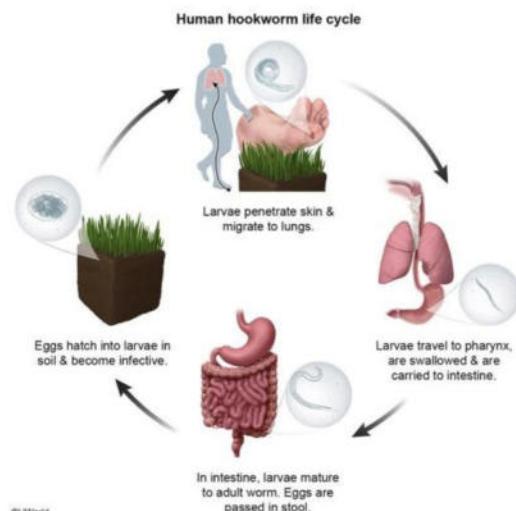
## UWORLD IMAGES

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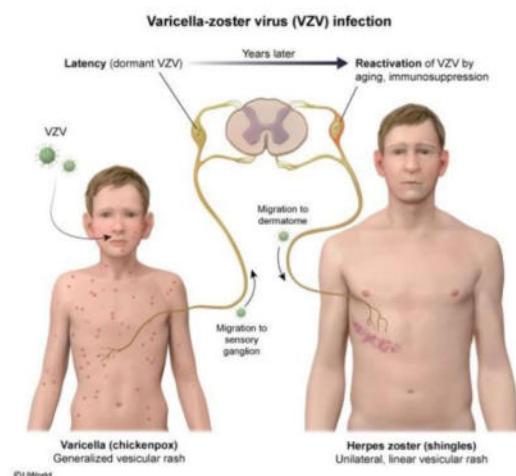
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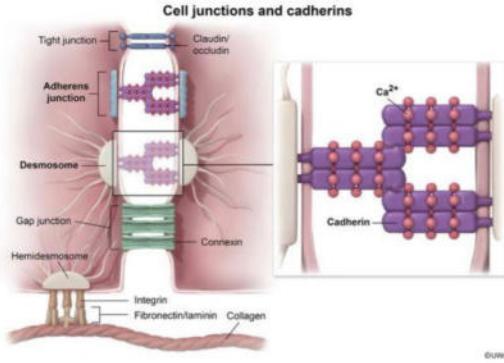
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Desmoglein 1 and 3 are components of cadherin which in turn are components of Desmosomes and zona adherens.

they are cleaved by serine protease / exfoliative exotoxin A secreted by Staph Aureus.

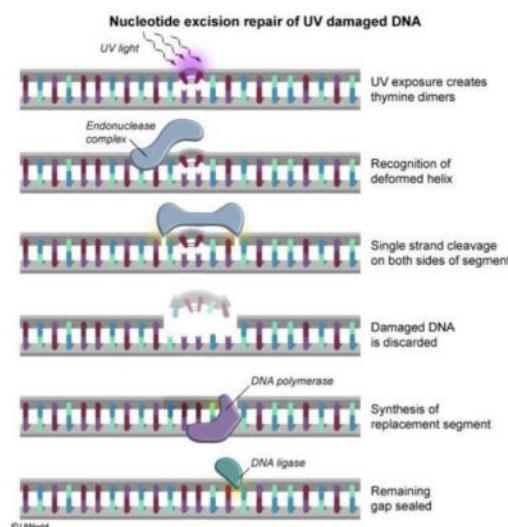
causing Bullous Impetigo or SSSS in children.

they are also targeted by autoantibodies in Pemphigus Vulgaris.

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UV Rays --> Nucleotide Excision repair

IR (X-rays or gamma-rays) --> Non-Homologous End joining

chemical exposure --> Base excision repair

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## Chronic venous insufficiency



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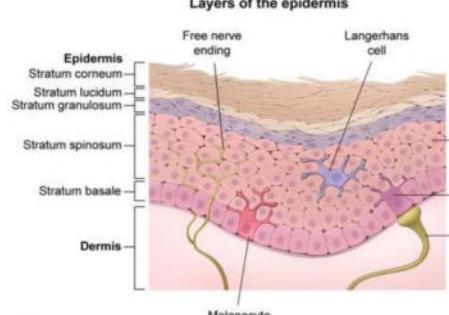
discoloration of skin due to extravasation of RBCs -->

### HEMOSIDERIN DEPOSITION

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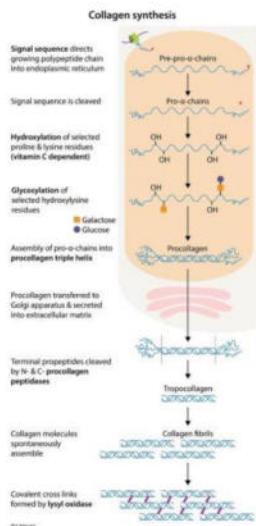


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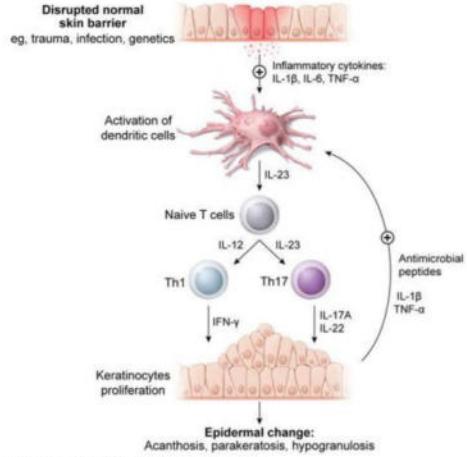


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### Pathophysiology of psoriasis

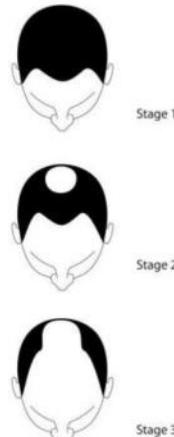


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Androgenetic alopecia



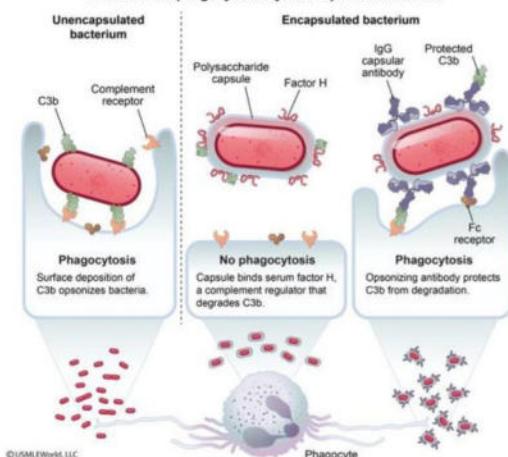
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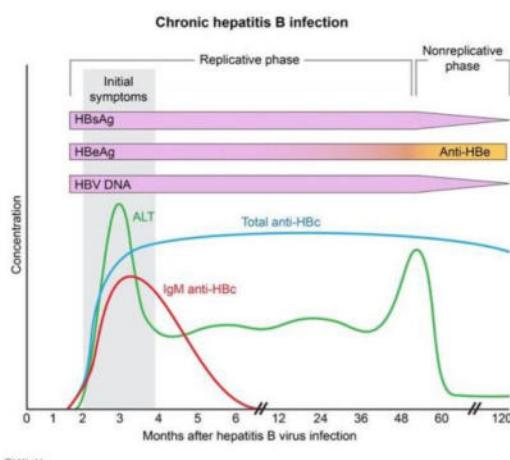
Avoidance of phagocytosis by *Haemophilus influenzae*



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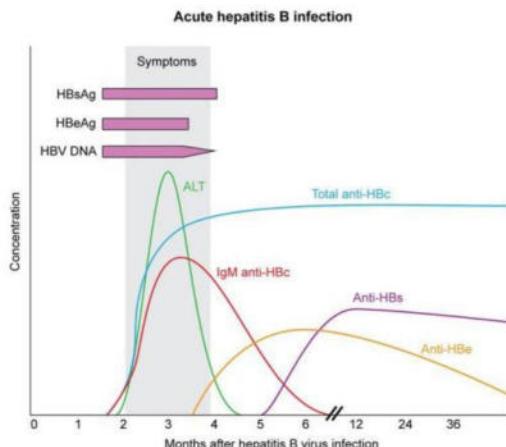


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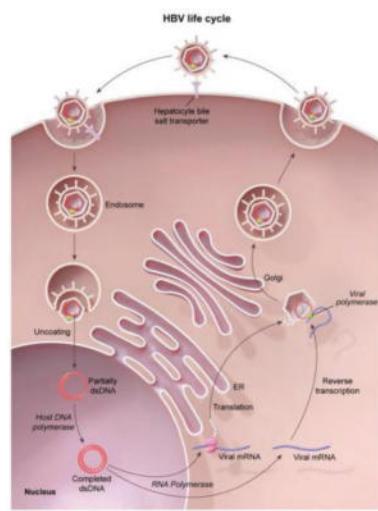
ALT = alanine aminotransferase; anti-HBc = hepatitis B core antibody; anti-HBe = hepatitis B e antibody; anti-HBs = hepatitis B surface antibody; HBeAg = hepatitis B e antigen; HBsAg = hepatitis B surface antigen; HBV = hepatitis B virus.

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partial dsDNA --> complete dsDNA ---> HOST

dsDNA --> mRNA [transcription] ---> HOST

mRNA --> virion protein [translation] ---> HOST

mRNA --> partial dsDNA for virion ---> VIRAL reverse transcriptase

also note that newly synthesised HBV Virions are released via

EXOCYTOSIS

vs

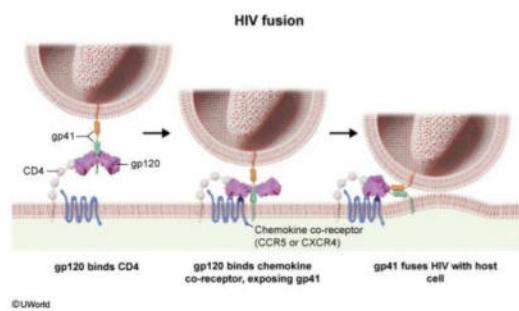
CELL LYSIS by some viruses (eg – HSV ??)

complete dsDNA of the HBV is not usually integrated into the host genome.

If it does, then it contributes to hepatocarcinogenesis.

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two types of HIV Virus based on the mechanism of entry.

Macrophages, T-Lymphocytes and Dendritic Cells

all these three cell types contain high concentration of CD4 receptors.  
Hence, they are preferentially attacked by HIV.

Macrophages contains less concentration of CXCR4  
but

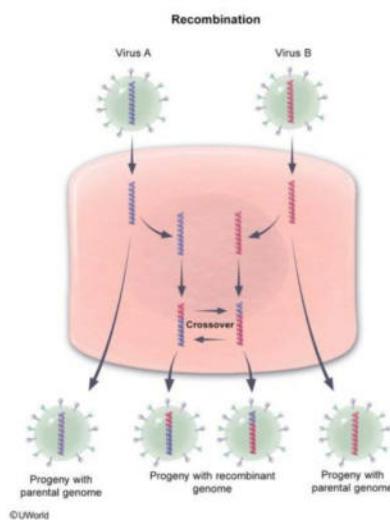
T-Lymphocyte contain normal level of CXCR4.

both these contain equal level of CCR5.

Hence, maraviroc (which targets CCR5 Receptor) wont be effective in HIV treatment of a patient infected with X4 trophic /  
T- Lymphotrophic strain.

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example :-

a strain of HSV has mutated gene conferring resistance.

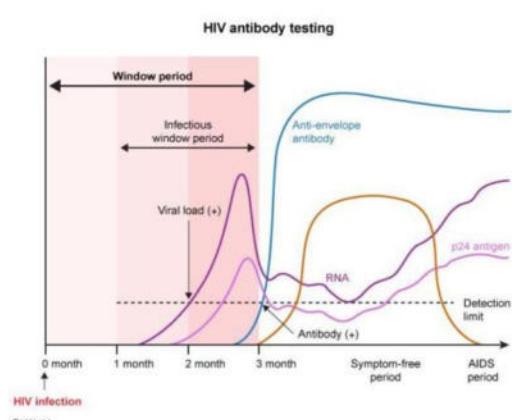
when another strain which doesn't have this mutation too infects the cell and acquires this resistance, which is passed onto its progeny.

this is known as recombination.

(exchange of genetic material by crossover of homologous regions)

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Window Period –

pt. may be asymptomatic or  
present with mononucleosis like symptoms  
(fever, myalgias, malaise, fatigue, diffuse LAD)

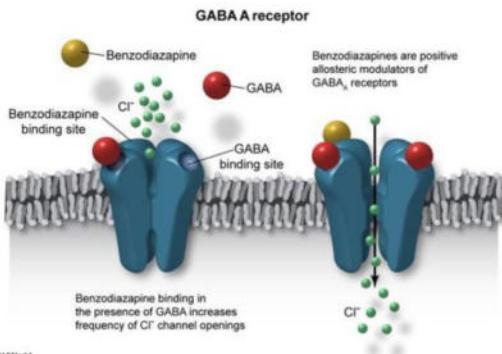
but distinguishing additional features like

1. generalised M-P Rash
- or
2. multiple, shallow oropharyngeal ulcers

named so bcz of high viral load/ p24 Ag but negative serology testing

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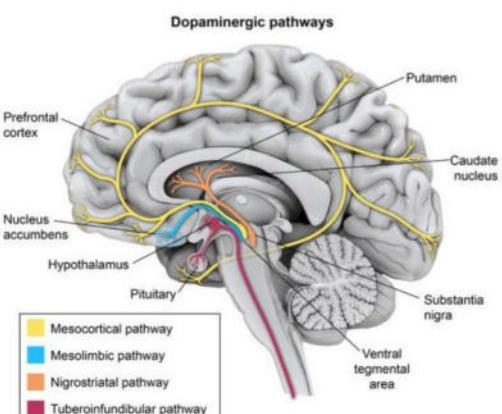
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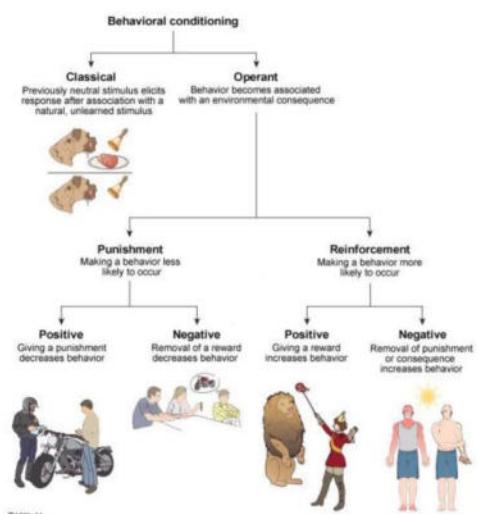
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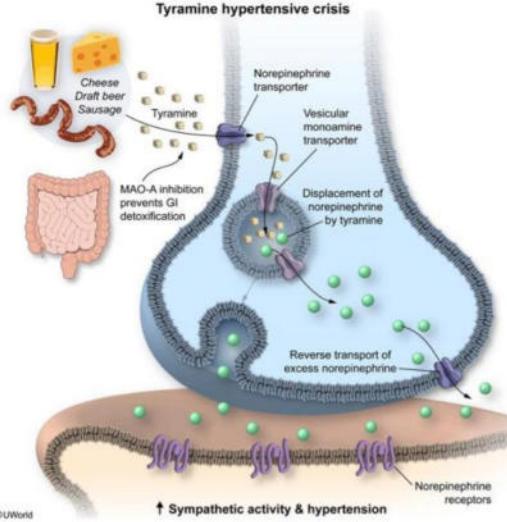
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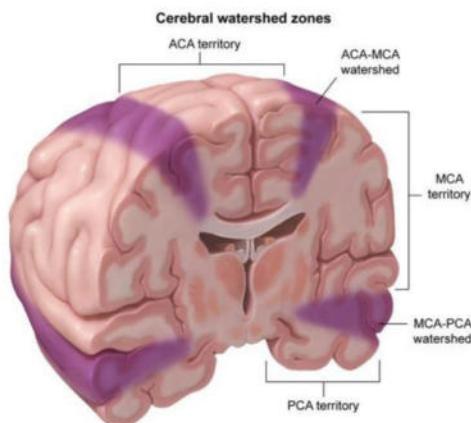
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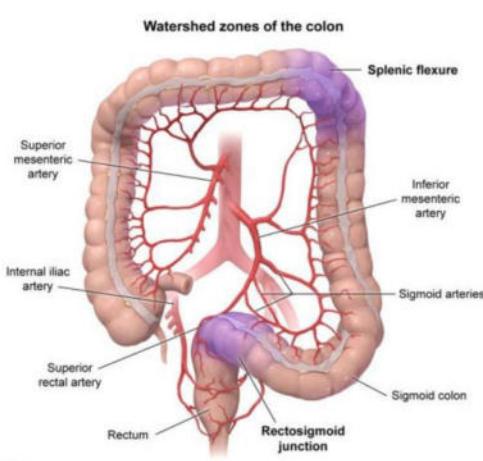
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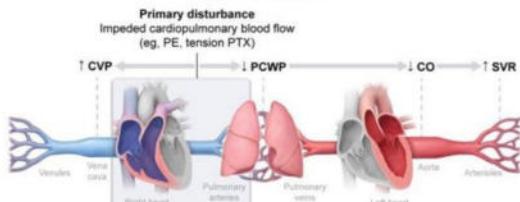
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### Obstructive shock

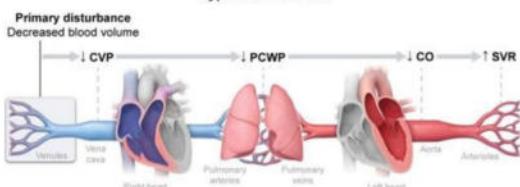


CO = cardiac output; CVP = central venous pressure; PCWP = pulmonary capillary wedge pressure;  
PE = pulmonary embolism; PTX = pneumothorax; SVR = systemic vascular resistance.  
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### Hypovolemic shock

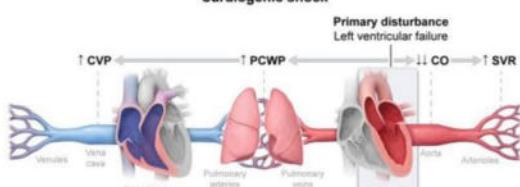


CO = cardiac output; CVP = central venous pressure;  
PCWP = pulmonary capillary wedge pressure; SVR = systemic vascular resistance.  
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### Cardiogenic shock

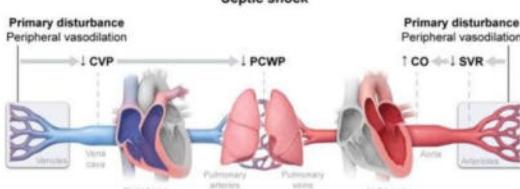


CO = cardiac output; CVP = central venous pressure;  
PCWP = pulmonary capillary wedge pressure; SVR = systemic vascular resistance.  
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### Septic shock

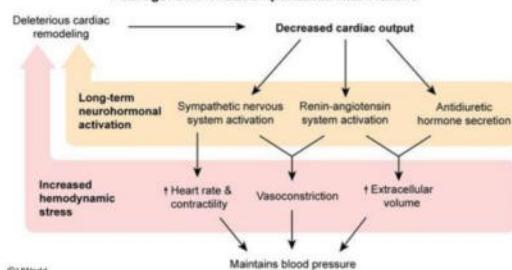


CO = cardiac output; CVP = central venous pressure;  
PCWP = pulmonary capillary wedge pressure; SVR = systemic vascular resistance.  
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### Pathogenesis of decompensated heart failure



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presents with

acute onset chest pain + shortness of breath  
+– near syncope or syncope

ABC changes –  
hypoxemia, reduced pCO<sub>2</sub> due to hyperventilation – respi. alkalosis

tachycardia + signs of RV failure – elevated JVP + clear lungs.  
(on ECHO – enlarged RV Cavity)

similar presentation in

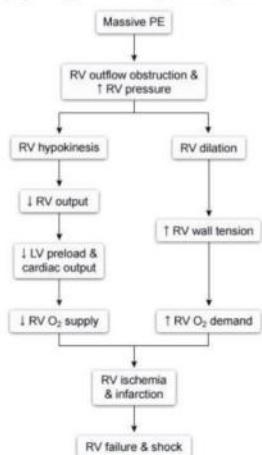
Cardiac Tamponade – except that hypoxemia is not seen.  
(on ECHO – RA collapse during diastole)

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### Pathophysiology of massive pulmonary embolism



LV = left ventricular; PE = pulmonary embolism; RV = right ventricular. ©UWorld

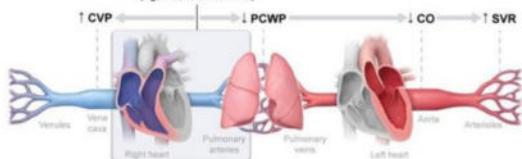
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### Obstructive shock

Primary disturbance  
Impeded cardiopulmonary blood flow  
(eg. PE, tension PTX)

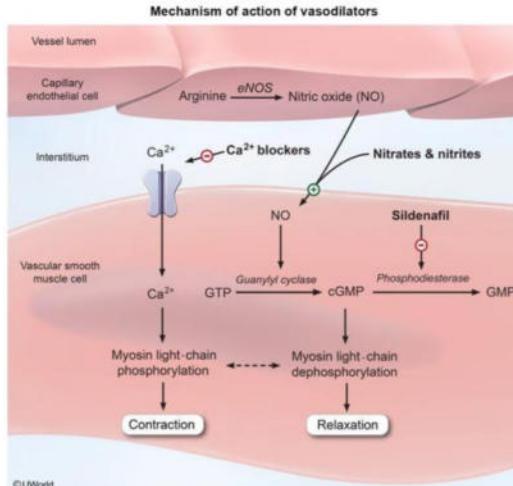


CO = cardiac output; CVP = central venous pressure; PCWP = pulmonary capillary wedge pressure;  
PE = pulmonary embolism; PTX = pneumothorax; SVR = systemic vascular resistance.  
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Nitrates --> metabolised by vascular SMC to NO -->  
activates enzyme --> guanylate cyclase -->  
increased synthesis of cyclic mononucleotide (cGMP) -->

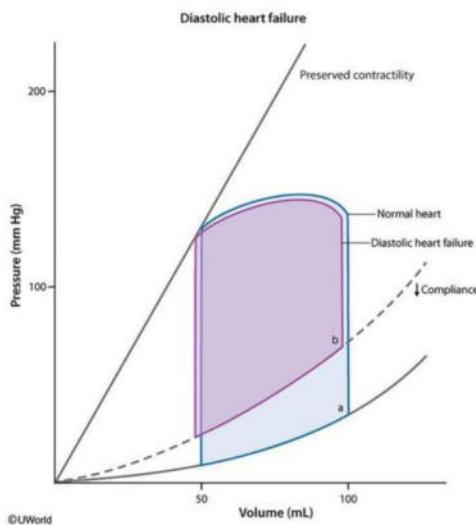
decrease intracellular Ca concentration to reduce the activity of MLCK and  
increase dephosphorylation of Myosin Light Chain (thorough activation of phosphatase) -->

SMC relaxation.

BNP, ANP similar pathway.

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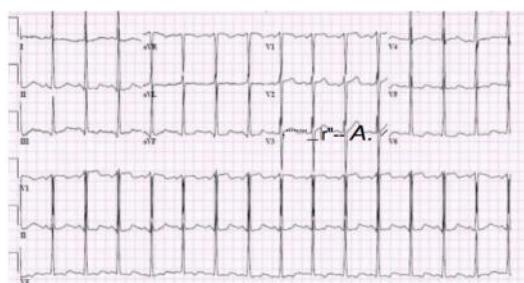
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Torsades

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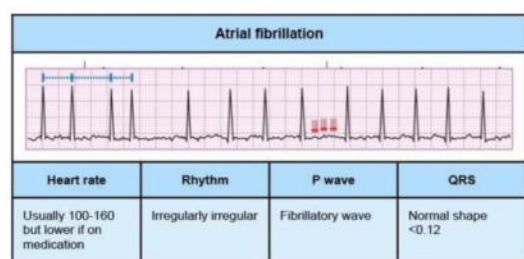
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LVH

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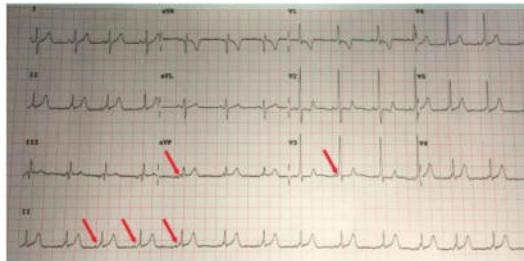
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note the

1. regular rhythm (R-R Interval)
2. delta wave (in lead 2)

seen in WPW Syndrome



delta wave – slurred and broad initial upstroke of the QRS complex

seen in WPW Syndrome

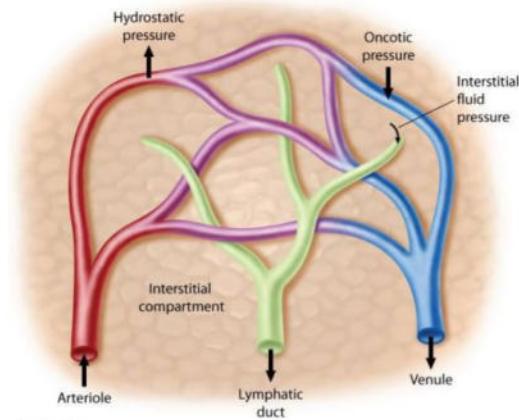
(includes BOTH symptoms + ECG changes)

along with

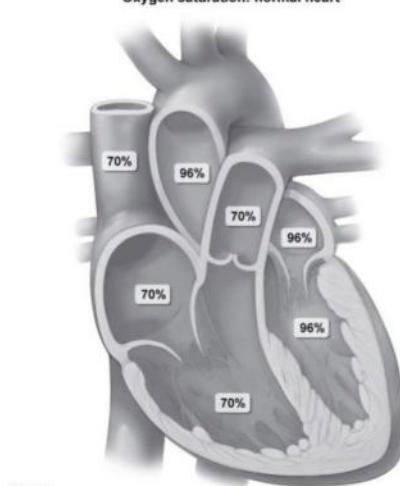
shortened PR Interval

widened QRS

Factors affecting interstitial fluid volume



Oxygen saturation: normal heart

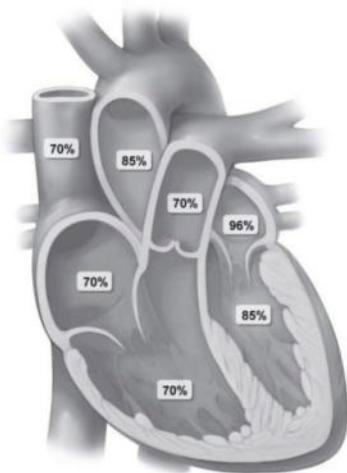


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Oxygen saturation: Eisenmenger syndrome

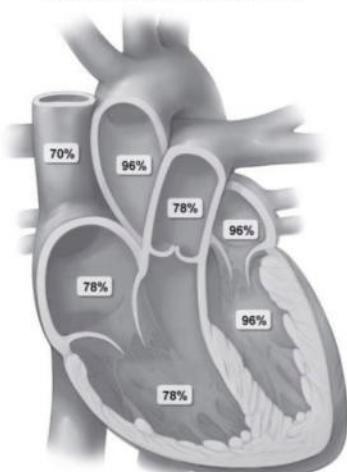


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Oxygen saturation: atrial septal defect

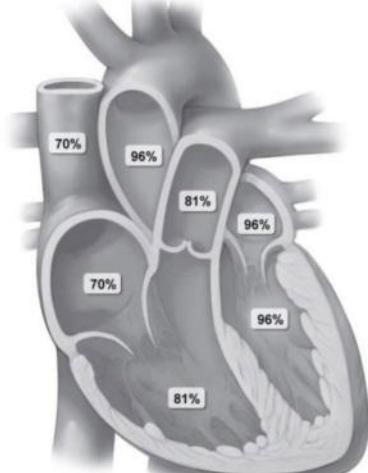


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Oxygen saturation: ventricular septal defect

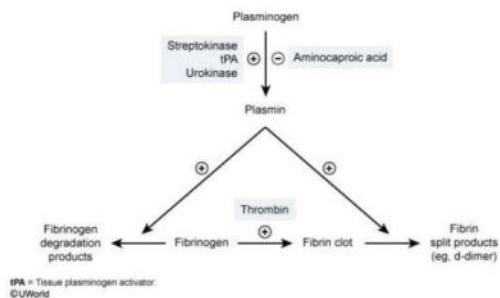


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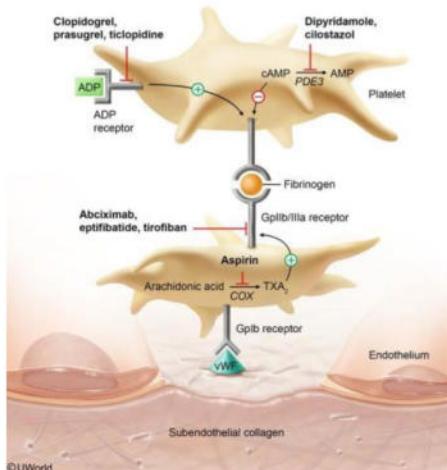
### Fibrinolytic pathway



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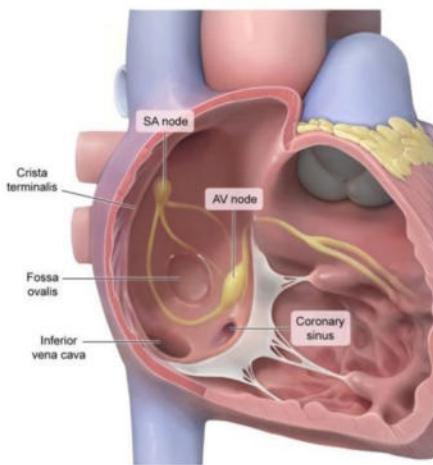
#### Antiplatelet medications



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#### Right atrial anatomy



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SA Node – RA ; upper part near the ostia of SVC

AV Node – RA ; on the septal side near the ostia of Coronary Sinus

site of flutter – RA ;

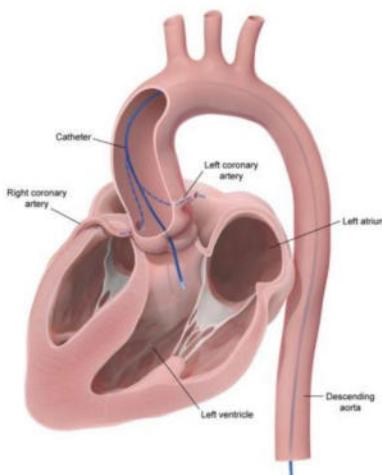
Lower part near the ostia of IVC & tricuspid annulus

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Left heart catheterization



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ARTERIAL catheterisation

to access the Left Heart.

radial/femoral ARTERY --> ascending aorta -->

to measure LV Pressure (aortic valve crossed)

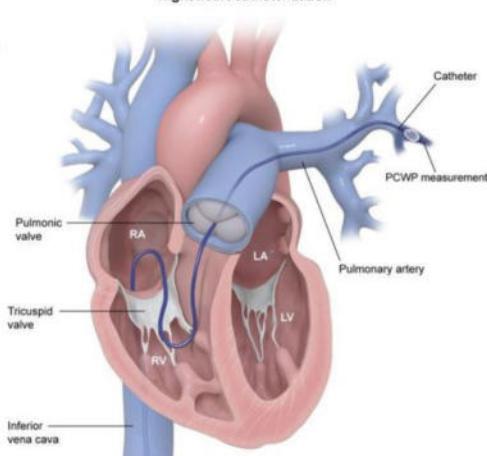
for coronary angiography, dye placed in the coronary arteries (valve not crossed)

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Right heart catheterization



\*Approximates left atrial pressure.

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