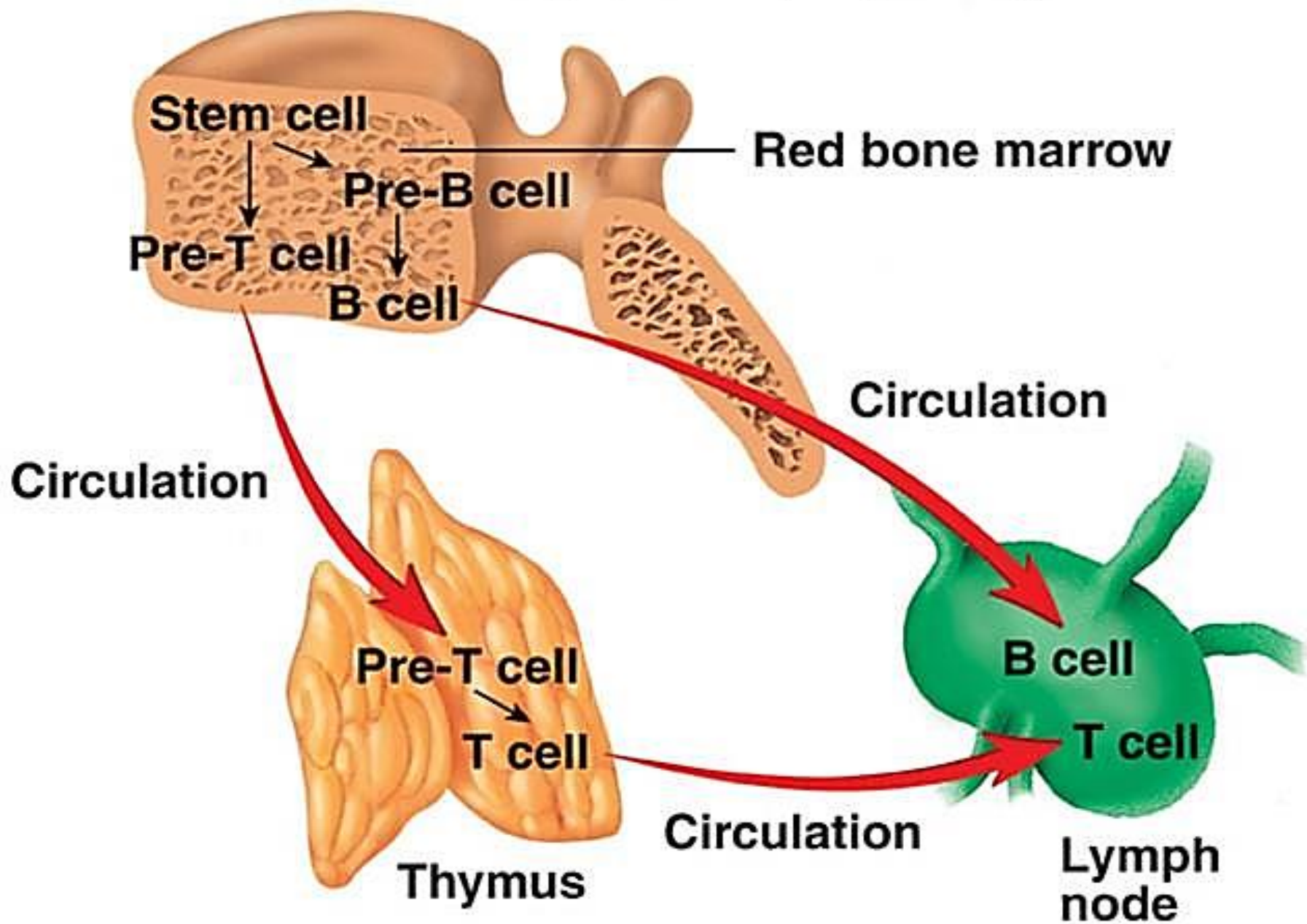


Approach to Lymphadenopathy

Dr. Mahmoud Ibrahim





Bone Marrow

(2) Some undifferentiated lymphocytes are processed in the thymus gland to become T cells.

Thymus gland

Blood transport

Blood transport

Lymph node
T cell

Blood transport

B cell

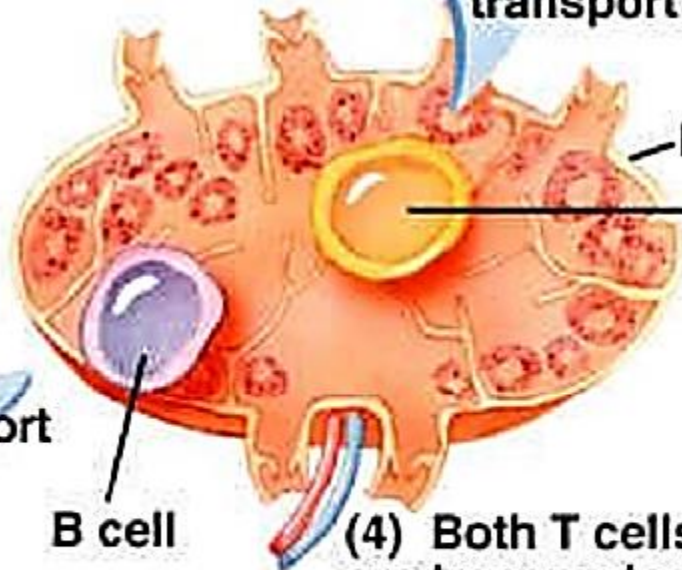
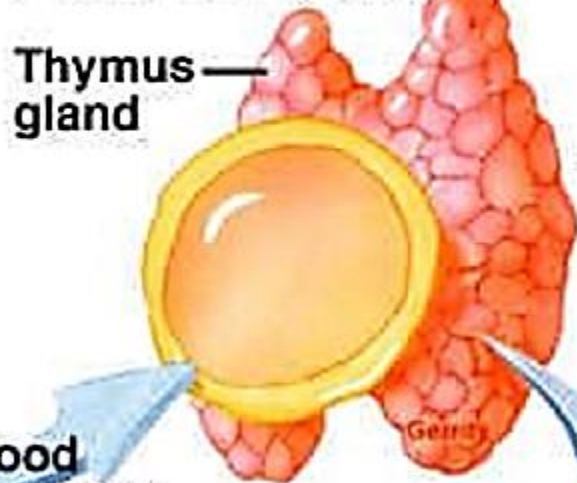
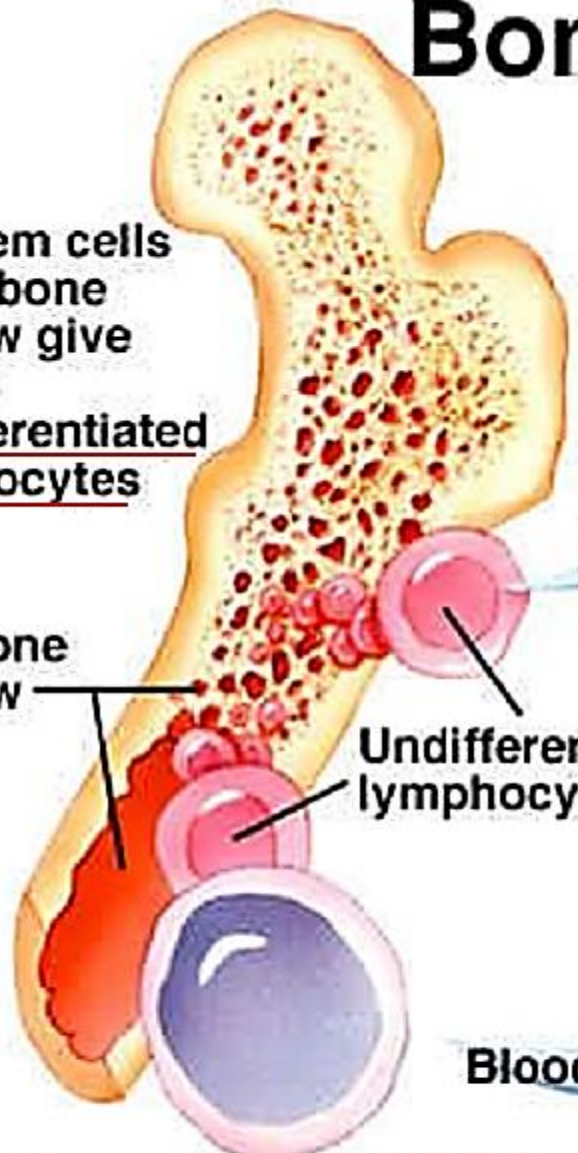
(4) Both T cells and B cells are transported through the blood to lymphatic organs, such as the lymph nodes, ducts, and spleen

(1) Stem cells in red bone marrow give rise to undifferentiated lymphocytes

Red bone marrow

Undifferentiated lymphocytes

(3) Some undifferentiated lymphocytes are processed, probably within the bone marrow, to become B cells.



Lymphatic Organs

□ Primary Lymphatic Organs :-

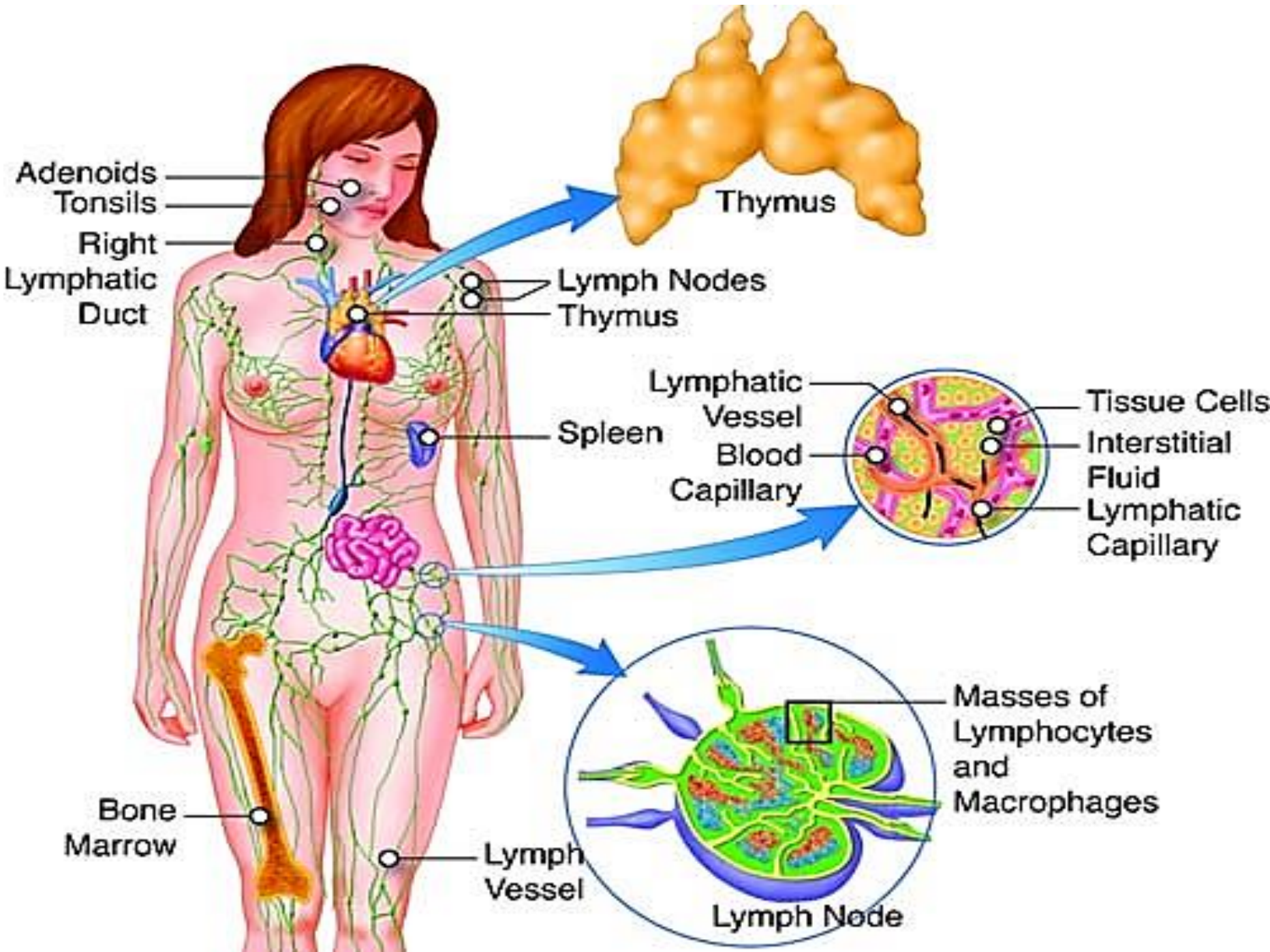
- The red bone marrow
- The thymus gland

(Lymphocytes originate and mature in these organs)

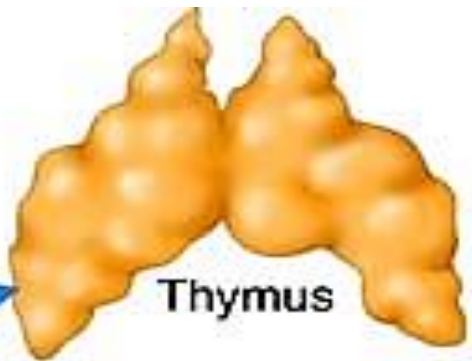
□ Secondary Lymphatic Organs:-

- The spleen
- The lymph nodes
- Other organs, such as: the tonsils, Payer's patches, and the appendix, ..

(All the secondary organs are the places where lymphocytes encounter and bind with antigens, after which they proliferate and become actively engaged cells)



Adenoids
Tonsils
Right
Lymphatic
Duct



Thymus

Lymph Nodes
Thymus

Spleen

Lymphatic
Vessel
Blood
Capillary

Tissue Cells
Interstitial
Fluid
Lymphatic
Capillary

Bone
Marrow

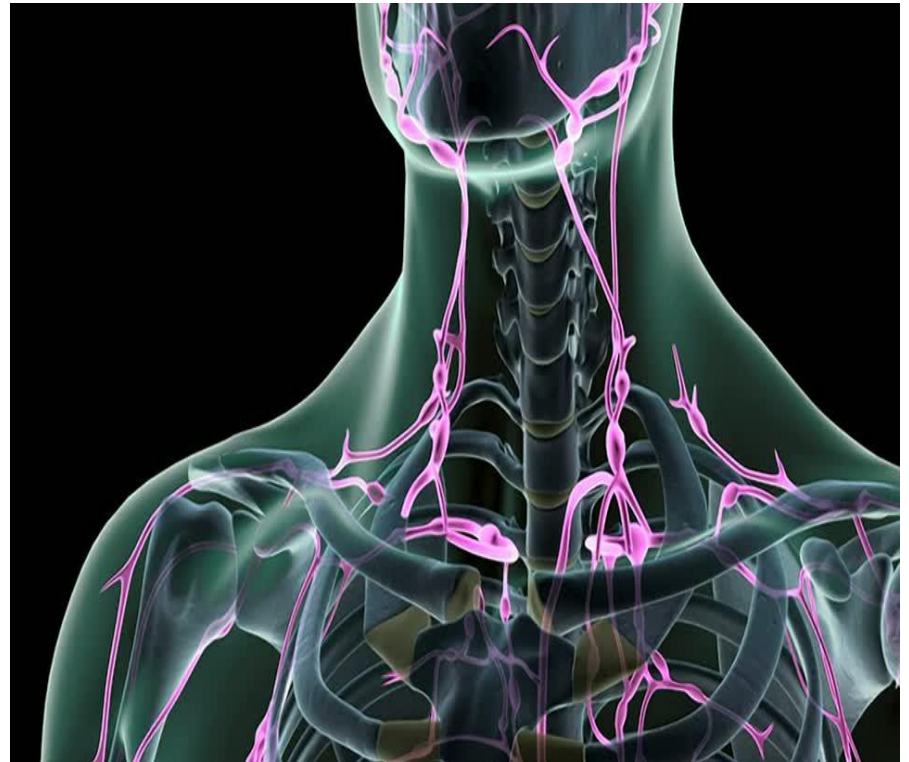
Lymph
Vessel

Masses of
Lymphocytes
and
Macrophages

Lymph Node

Lymphadenopathy

- Enlargement of the LN (**specific or nonspecific causes**).
- LYMPHADENITIS:
- Genaralised or local Lymphadenopathy.



Clinical Assessment

- **Medical History**
- **Physical Examination**
- **Diagnosis**
- **Laboratory Tests**
- **Excisional LN Biopsy**
- **Treatment**



Common causes of generalized lymphadenopathy

- **EBV/CMV**
- **AIDS** /AIDS related complex
- Toxoplasmosis
- Secondary syphilis

Infectious



- **ALL / CLL**
- **Lymphoma**

Neoplasia



- **Serum Sickness**
- **Drugs (Phenytoin)**
- **SLE**
- **Rheumatoid Arthritis**

Hyper-sensitivity



- **Hyperthyroidism**
- **Lipid storage disease**

Metabolic



Common Causes of localized lymphadenopathy (Site Predilection)

- **Viral Conjunctivitis**
- **Trachoma**
- **Cat-scratch disease**
- **Tularemia**
- **Sarcoidosis**

Pre-auricular



- **Rubella**
- **Scalp infection**

**Post-auricular/
Occipital**



- **Pharyngitis**
- **EBV**
- **Toxoplasmosis**
- **Sarcoidosis**

Cervical



- **Pharyngitis/buccal cavity tumor**
- **Nasopharyngeal tumor**
- **Thyroid malignancy**

Submandibular



Common Causes of localized lymphadenopathy (Site Predilection)

- **Pulmonary / Mediastinal / Esophageal Malignancy**
- T.B.
- Sarcoidosis
- Toxoplasmosis

Right supraclavicular



- **Intra-abdominal malignancy**
- RCC
- Ovarian/Testicular /Prostate malignancy

Left supraclavicular
(Virchow's)



- Syphilis(bilateral)
- Sarcoidosis
- Infection(unilateral)
- Leprosy
- IMN
- CLL/Lymphoma

Epitrochlear



- **Cancer Breast / Breast infection**
- Melanoma
- Lymphoma
- Ipsilateral upper limb infection / Reaction to immunization
- Juvenile RA

Axillary



Common Causes of localized lymphadenopathy (Site Predilection)

- Lymphoma
- Bronchogenic Carcinoma
- T.B.
- Sarcoidosis
- Histiocytosis
- Coccidiomycosis

Hilar



- Gut Adenocarcinoma
- Hodgkin's disease
- T.B.
- Lymphoma
- Bladder carcinoma

Abdominal



- **Syphilis**
- **Genital herpes**
- Lymphogranuloma venereum
- Chancroid
- Lower extremity/local infection
- Lymphoma
- Metastatic carcinoma from: rectum, genitalia or lower limb(melanoma)

Inguinal



- Lymphomas
- Leukemias
- Cat-Scratch disease
- Metastasis
- Sarcoidosis
- Granulomas

Any region







Clinical Approach

I. Age:

- TB: in children & young children
- HD: highest incidence () 20-40 years
- NHL: middle age & late life
- ALL: Highest in first 6 years

Old age; secondary metastatic carcinoma.

II. Occupation: Brucellosis

III. Socio economic status

Complaints

Presentation:

-Swelling

-Pressure symptoms

-Pressure on veins → oedema

-Pressure on nerves → pain

-Constitutional symptoms

-Mediastinal Syndrome

History of presenting

I. Duration

II. Which group was 1st affected?

III. Pain

IV. Fever

V. Primary focus

VI. Loss of appetite & weight

VII. Pressure effects

accompanying symptoms

I. Fever

II. Sore throat

III. Cough

IV. Fatigue

V. Weight loss

VI. Increased night sweating

VII. Pressure effects

Clinical Approach

History:

of infections, drugs

Distribution:

Localized or generalized

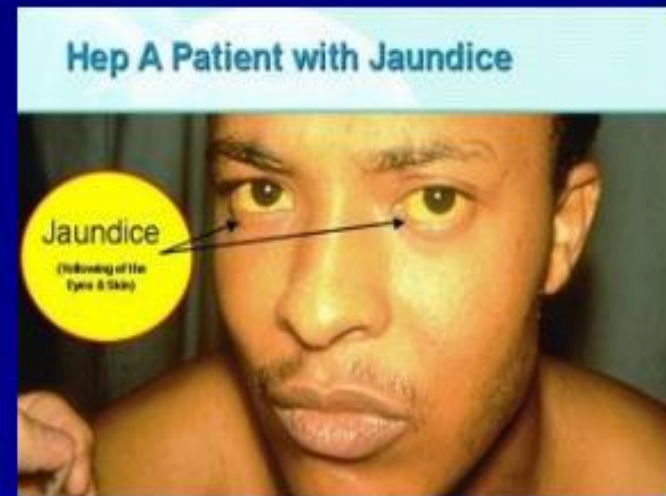
Single or multiple groups affected

Other signs:

Fever: H.D, NHL. Leukemia

Jaundice:

Eye: infection, subconjunctival Hage, exophthalmos



HISTORY WITH SPECIAL FINDINGS

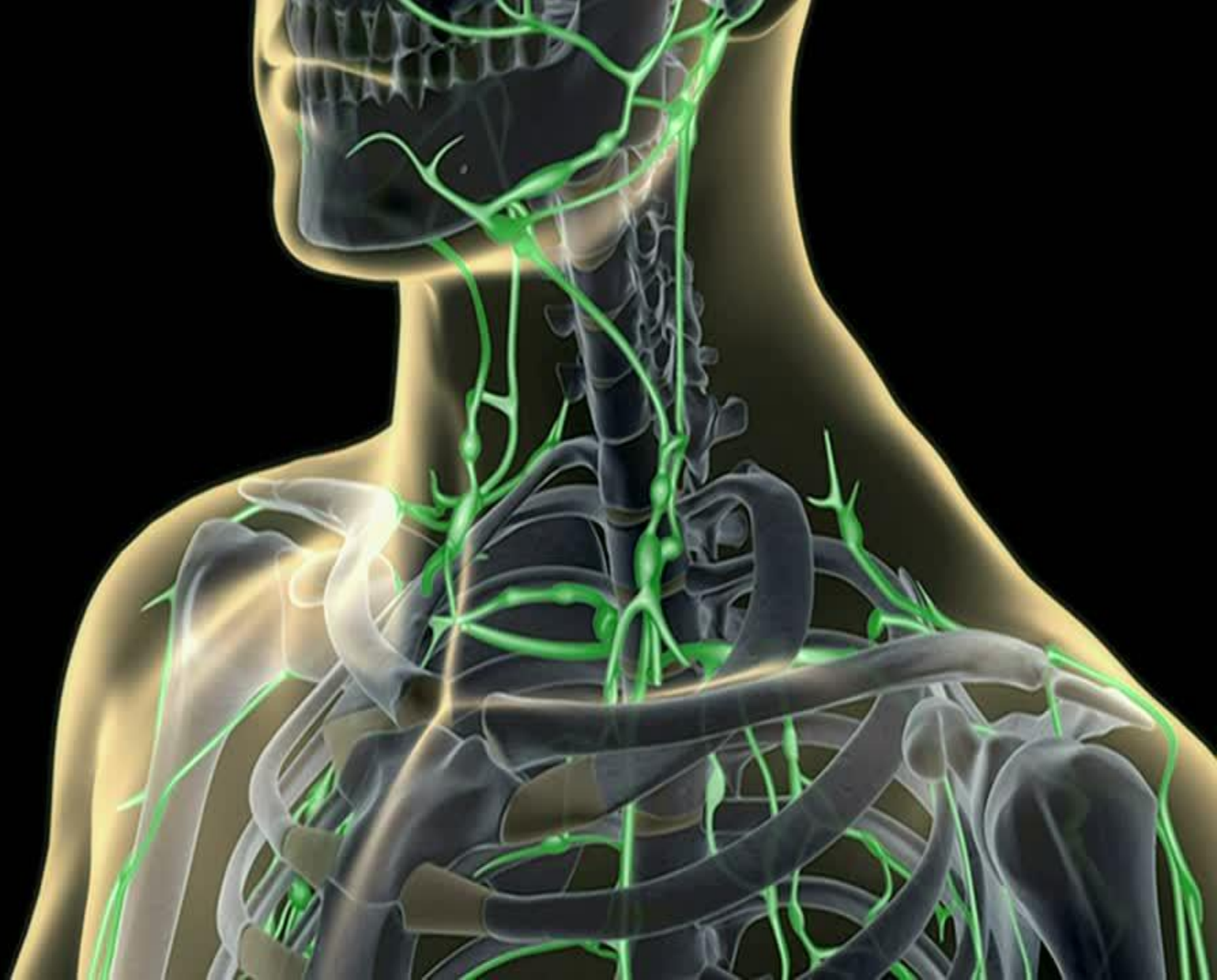
- **FEVER:lymphoma,TB,SLE,IMN, AIDS**
- **Petechial in a young boy with cervical LN :IMN**
- **Hard lump in breast +ipsilateral axillary LN :CA BREAST**
- **Non pitting oedema with inguinal adenopathy :FILARIASIS**
- **Fever,WT loss loss appetite night sweat LN:
TB ,AIDS,MALINGNANCY**
- **PROLONGED MEDICATION**
- **LYMPHADENOPATHY with SKIN lesion :SLE ,SARCOIDOSIS**

Past History

- I. h/o TB, Syphilis, any URTI,
- II. h/o recent blood transfusion.
- III. immuno suppression.
- IV. Any viral infection
- V. HISTORY OF MEDICATION: **phenytoin, cyclosporin, allopurinol, carbamazepine, hydralazine**

Family history

- h/o any
- TB in family,
 - Any malignancy (lymphoma)
 - Autoimmune disorders



General examination

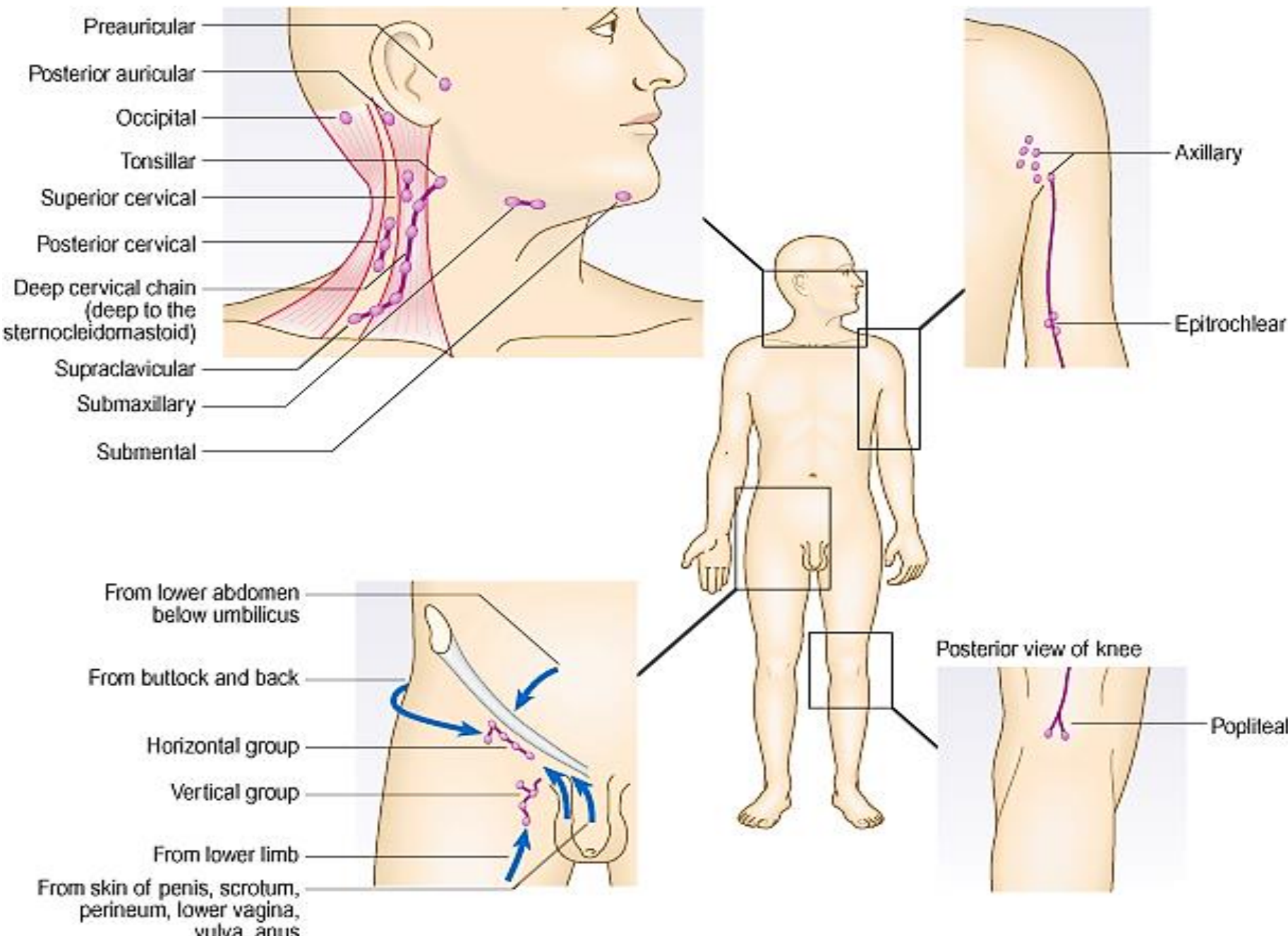


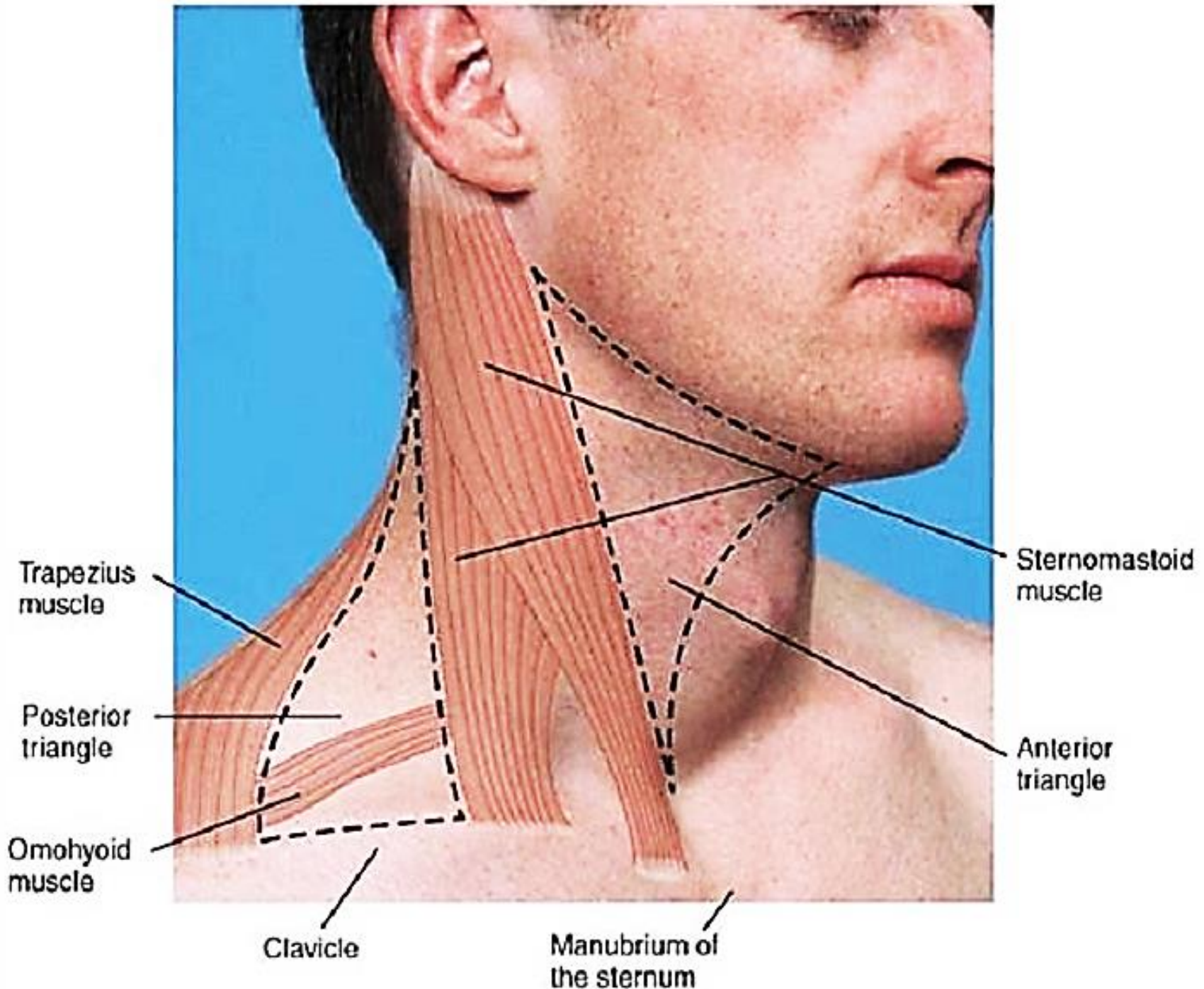
- I. Malnutrition**
- II. Anaemia**
- III. Icterus**
- IV. Lymphadenopathy**
- V. Edema**

Lymph nodes Examination Checklist

- 1- Cervical groups
- 2- Axillary groups
- 3-D'Spine Sign
- 4- Epitrochlear LN
- 5-Inguinal groups
- 6-Popliteal lymph nodes
- 7- Remember (liver and spleen)
- 8-Don't forget the draining areas







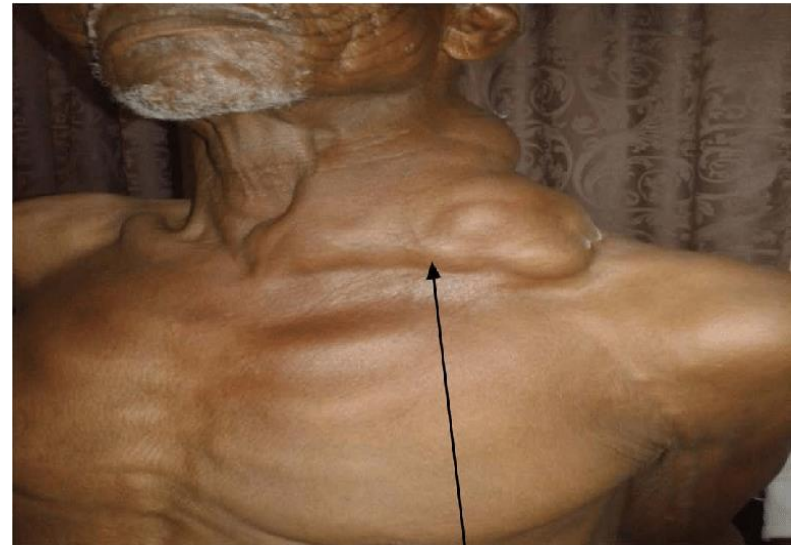
Lymph nodes Examination Checklist

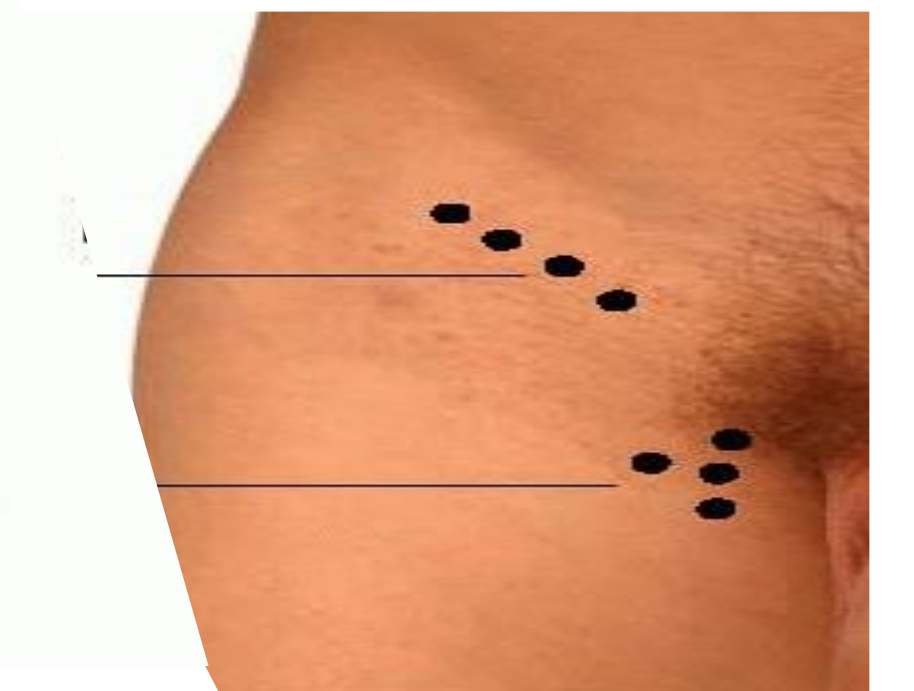
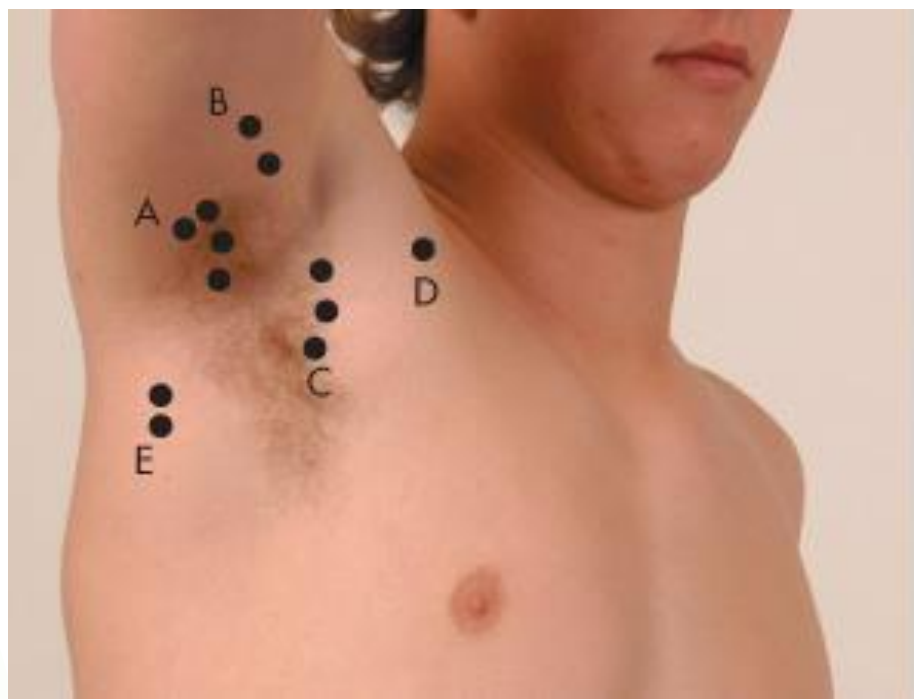
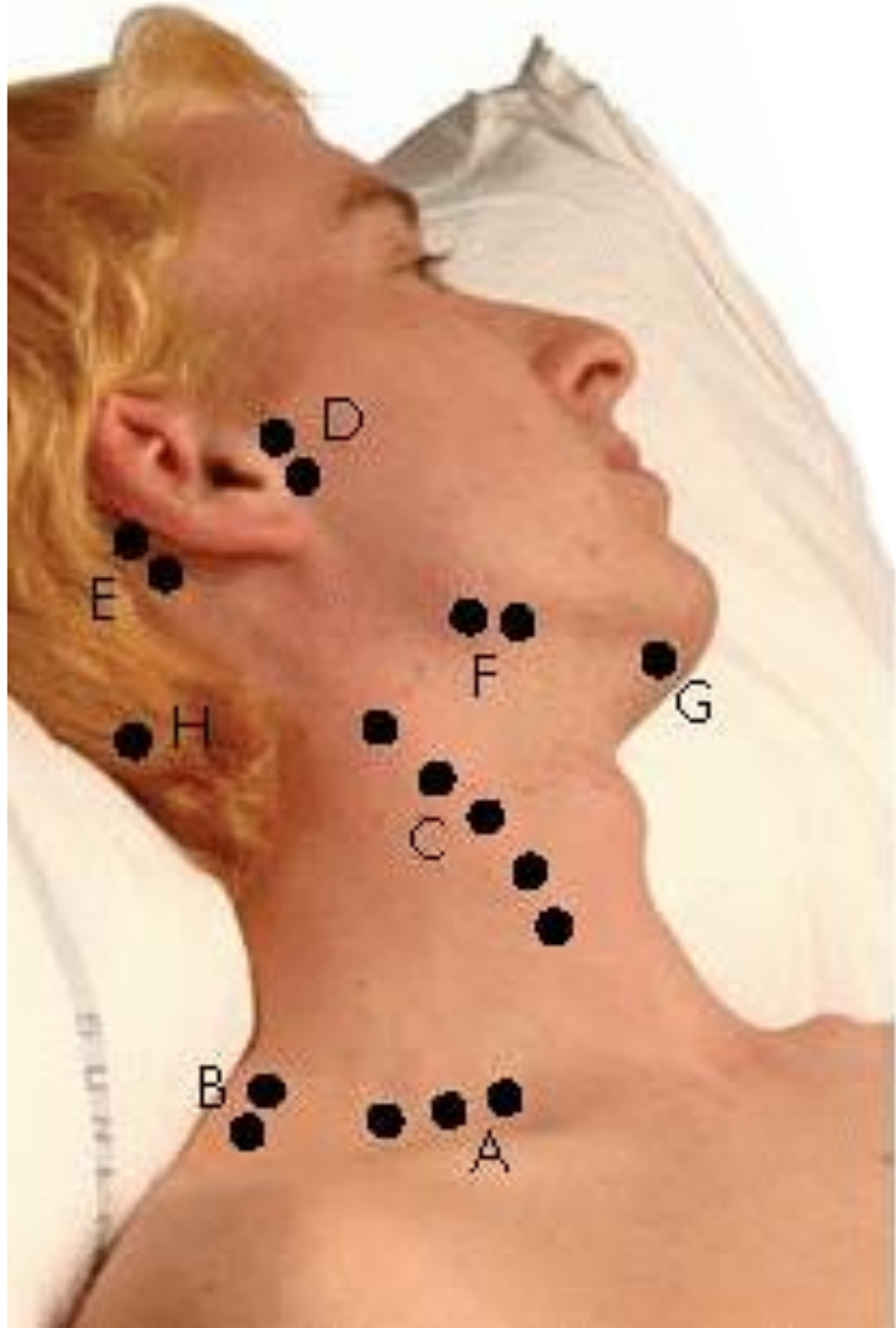
- Inspection**
- Palpation**
- Percussion**
- Auscultation**

□ Inspection

SSSSS (5S):

- 1- Site.
- 2- Shape.
- 3- Size.
- 4- Surface: Smooth, nodular, irregular.
- 5- Skin overlying the swelling (scars, colour...).
- 6- Other draining LN
- 7- Number
- 8- Pressure effect

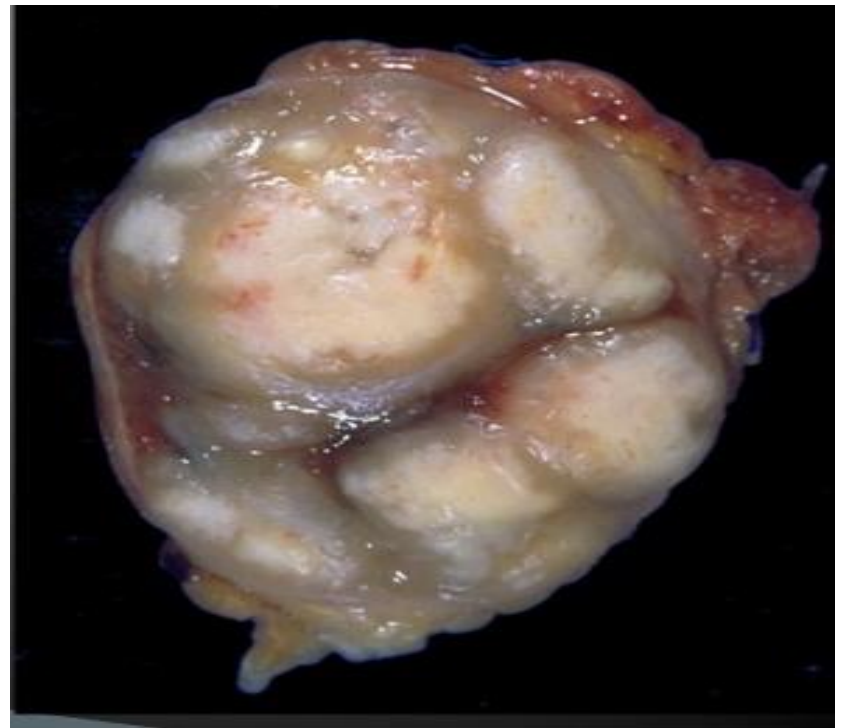




Palpation

The following points are to be fulfilled during palpation:

- ❑ **Confirm your inspection**
- ❑ **Temperature**
- ❑ **Tenderness**
- ❑ **Consistency**
- ❑ **Mobility**
- ❑ **Special signs**
- ❑ **Draining area**
- ❑ **Matted (TB counted)**
- ❑ **Amalgamated**





A



B



C





A



B



C

Epitrochlear nodes: Approximately 3 cm proximal to the medial humeral epicondyle, in the groove between the biceps and triceps brachii.

TT SSSS CE SSS (2T, 4S, CE, 3S)

- **Temperature of skin over swelling:** normal, warm, cold
(compare with contra-lateral side).
- **Tenderness** (look to the patient's face).
- **Site.**
- **Shape.**
- **Size.**
- **Surface:** Smooth, nodular, irregular.
- **Consistency:** Soft, firm, hard, cystic.
- **Edge:** Well-defined, ill-defined.
- **Surrounding** structures and mobility of the swelling:
- **Special signs:** e.g. are pulsations transmitted or expansile?.
- (Other) **Swellings.**

□ Auscultation

□ D'Spine Sign

- Normally bronchial breathing and bronchophony can be heard over cervical spine till C7.
- Trachea divides at T3 level.
- If there is a large posterior mediastinal mass between trachea and vertebra,
- Bronchial breathing and bronchophony can be heard further down thoracic vertebra below tip of C2 spine or T4 body.

□ Reverse D'Spine Sign

- If there is a large anterior mediastinal mass between trachea and sternum, bronchial breathing and bronchophony can be heard over supracardiac vessel area.





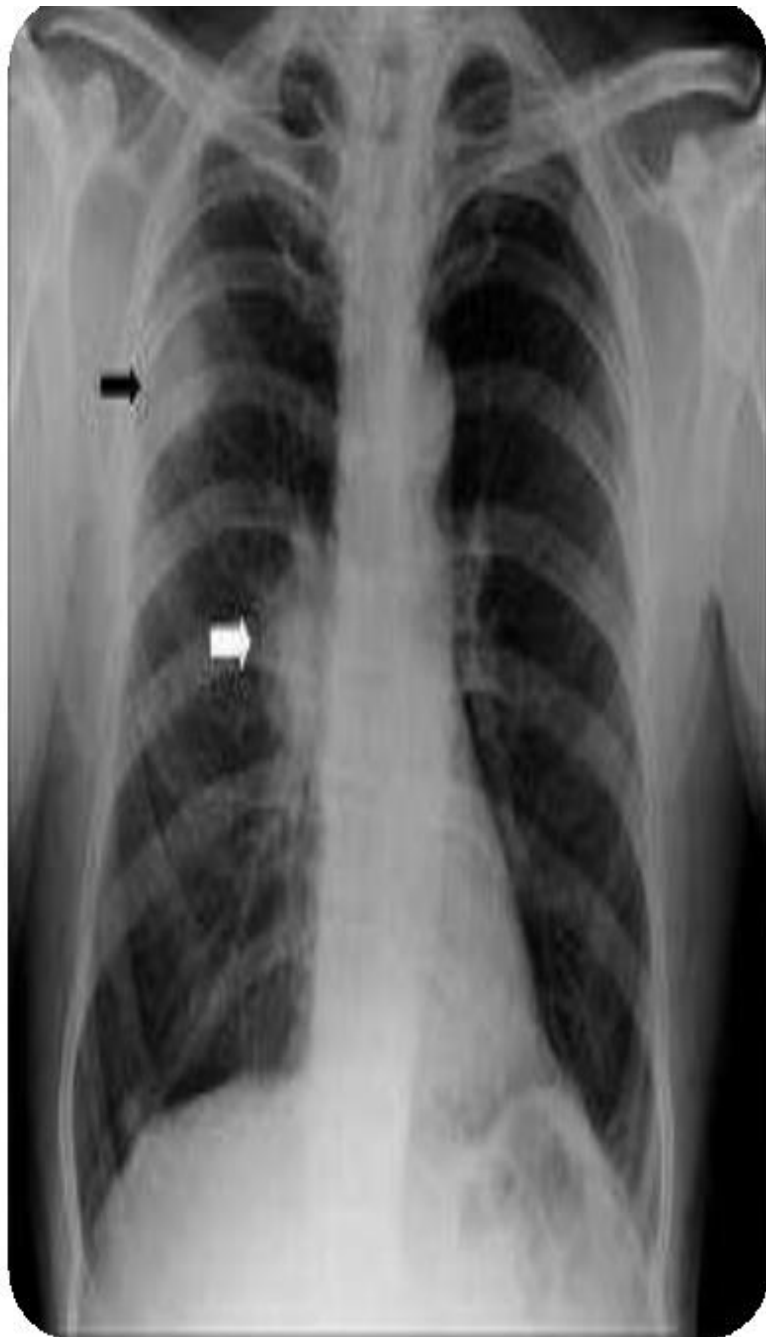






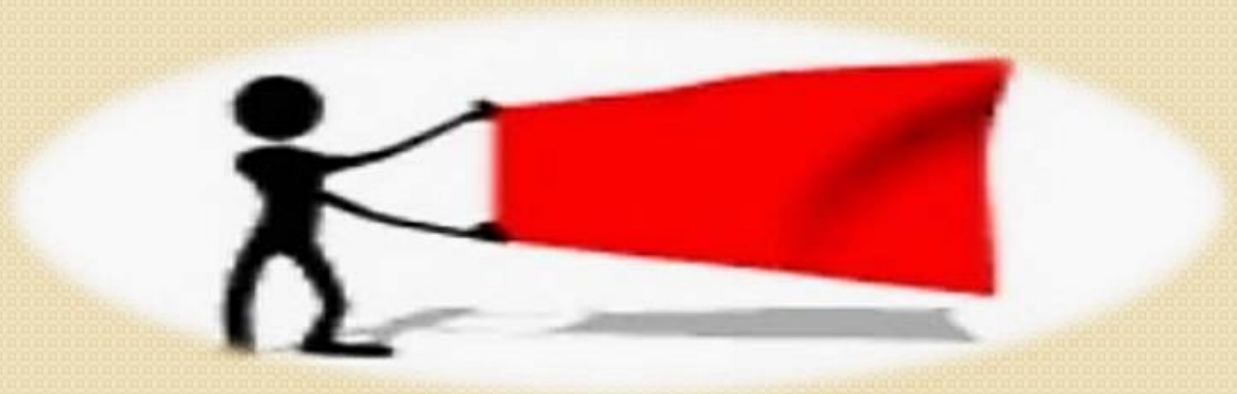






RED FLAGS IN LYMPHADENOPATHY

1. Fever, night sweats, and unexplained weight loss
2. A supraclavicular node
3. Hard and tender L.N. with a significant size or draining an area with a significant pathology
4. Matted or Fixed node(s)
5. Non-recessive node after 3 weeks period or after disappearance of fever



Clinical Considerations

- ❑ Is the palpable mass a **L.N.** ?
- ❑ **Acute** or **Chronic** ?
- ❑ **Epidemiological clues** ?
- ❑ **Site** ? {Localized or Generalized}
- ❑ **Number** ?
- ❑ **Size** ?
- ❑ **Character** ? {surface and consistency}
- ❑ **Discrete** or **Matted** ?
- ❑ **Tenderness** ?
- ❑ **Mobility** ?
- ❑ **Attachment** ? And **Relation** to adjacent **muscle** ?
- ❑ **Associated** Systemic and/or Localizing symptoms or signs?

Investigations

It includes:

I - Laboratory

II - Radiological

III - Others (as: Bronchoscopy, or BM Biopsy)

IV - Node Biopsy



Investigations

I - Laboratory:

☐ The laboratory investigation of patients with lymphadenopathy must be tailored to elucidate the etiology suspected from the patient's findings

☐ **CBC with differential count** :☐ provides useful data for the diagnosis of:

- ☐ Acute or Chronic leukemia's
- ☐ EBV or CMV mononucleosis(atypical lymphocytosis)
- ☐ Pyogenic infections
- ☐ Lymphoma with a leukemic component
- ☐ Immune cytopenias (in illnesses such as SLE)

☐ **ESR**

☐ **Serology**: may demonstrate:

- ☐ Antibodies specific to: components of
EBV(viral Capsid Ag), CMV, HIV, Toxoplasma, Brucella, etc

☐ **PCR-for**: CMV -DNA, T.B.

☐ **ANA/Anti-ds DNA antibody (SLE)**

☐ **Others**: In cases of hilar LAD, do:

- ☐ Serum ACE
- ☐ Tuberculin T.

Investigations

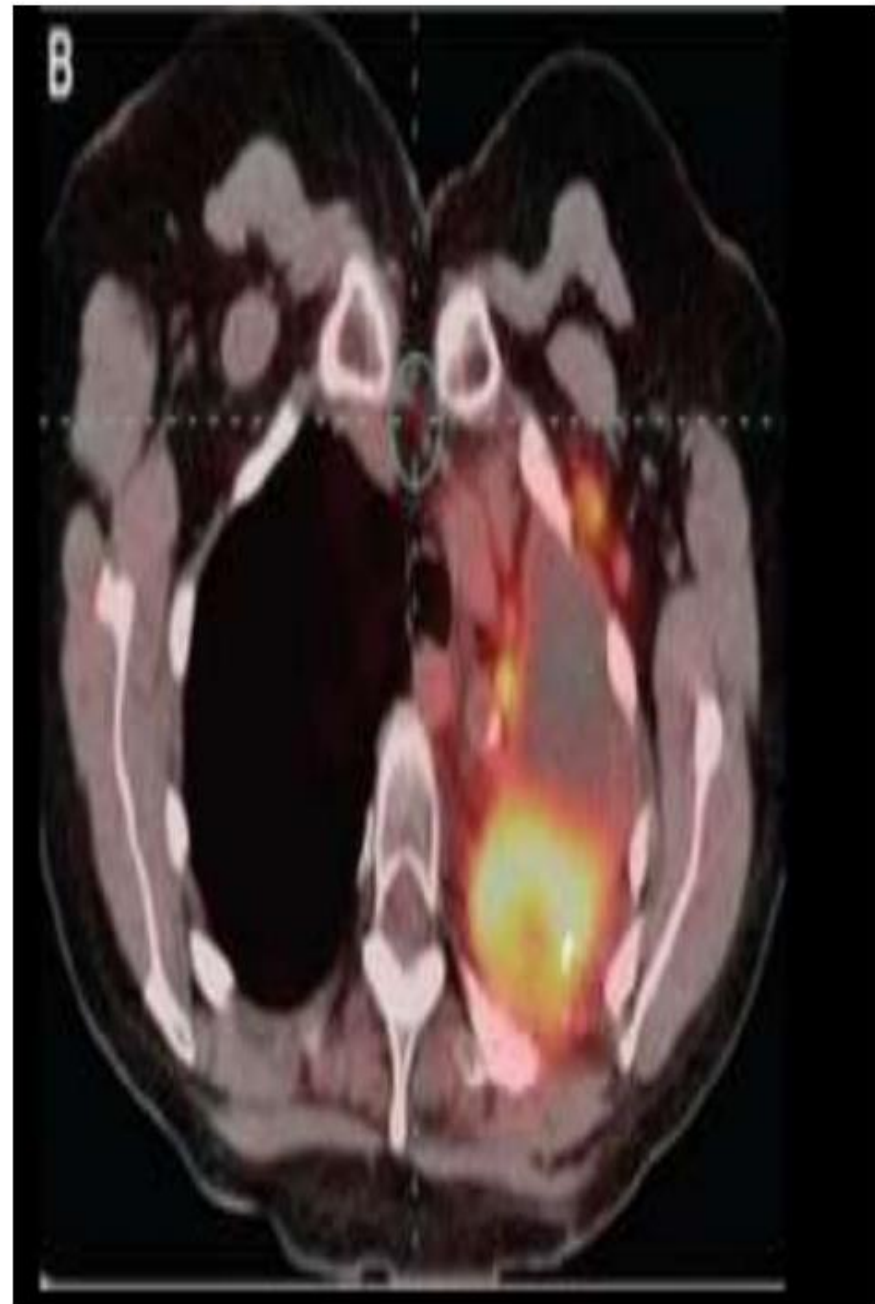
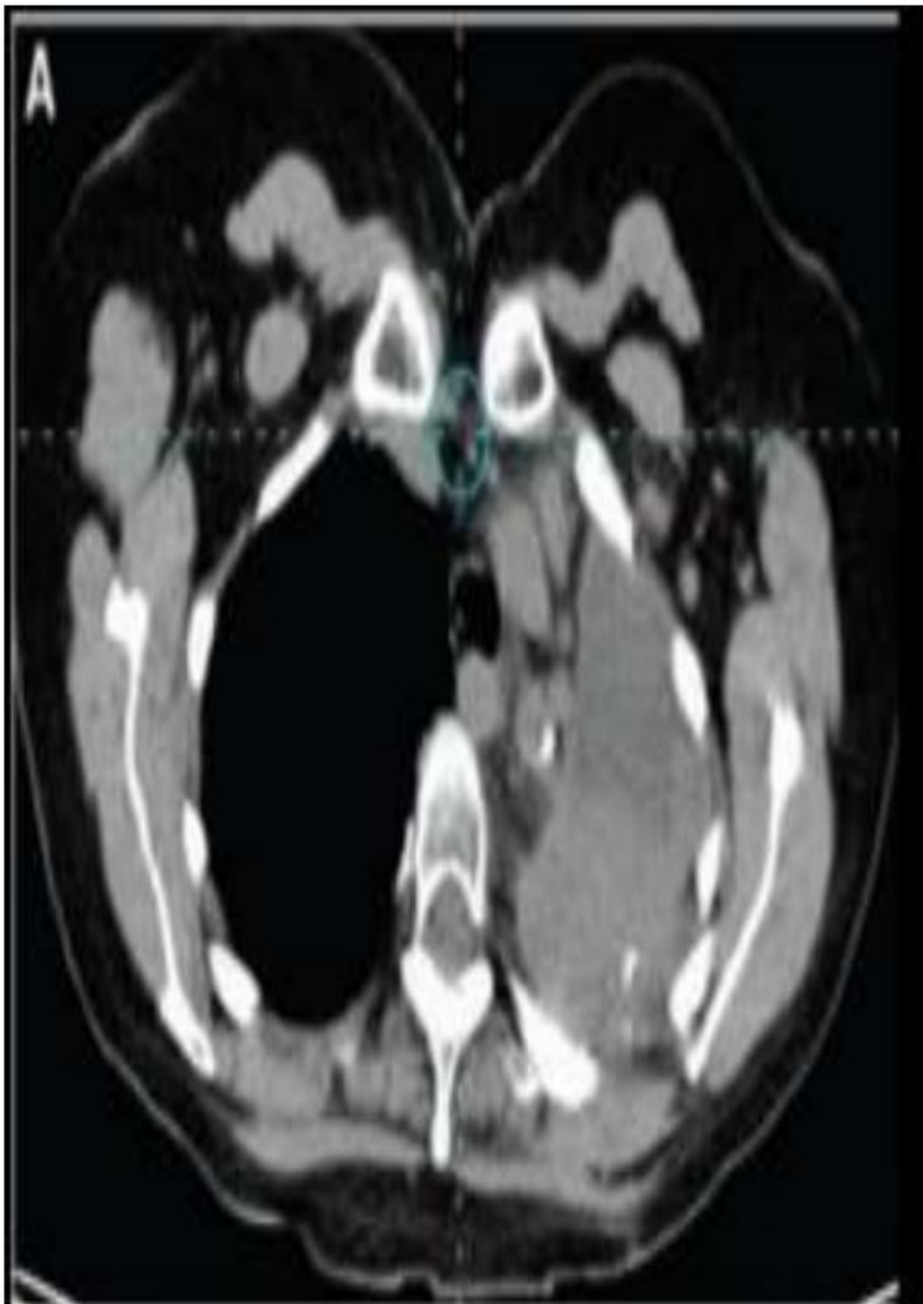
II - Radiological:

They include:

1. Chest X-Ray (CXR)
2. Node Ultrasonography (U/S) / Color Doppler U/S
3. Abdominal: U/S and CT
4. Throat culture/swab for regional affection
5. Magnetic Resonance Imaging scans(MRI)
6. Positron Emission Tomography scans(PET)

PET Scanner





Important common causes of lymphadenopathy

Generalised lymphadenopathy

Viral	Epstein-Barr virus (glandular fever or Burkitt's lymphoma), cytomegalovirus, HIV
Bacterial	TB, Brucellosis, syphilis
Protozoal	Toxoplasmosis
Malignancy	Lymphoma, acute or chronic lymphocytic leukaemia
Inflammatory	Rheumatoid arthritis, systemic lupus erythematosus, sarcoidosis

Localized

Infective	Acute or chronic, bacterial or viral
Malignancy	Secondary metastases, lymphoma (Hodgkin's or non-Hodgkin's lymphoma)

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