Lymphatic System

Lymph

- Watery fluid that surrounds body cells and flows in a system of lymph vessels
- Contains WBCs, lymphocytes and monocytes.
- Contains water, salts, sugars, and waste products of metabolism.

Lymphatic system

- Lymph nodes
- Lymph vessels and lymph fluid
- Lymphatic organs
  - Tonsils, thymus, and spleen
Lymph Nodes

• Clusters of lymph tissues.

• Functions of lymph system
  o Transports proteins back to blood
  o Absorb fats and transport back to blood
  o Important role is immune system

Lymph nodes

• Major groups of nodes are located in the cervical (neck), axillary (armpit), and inguinal (groin) regions of the body.

• Lymph is filtered through these nodes as it passes through lymph vessels.

• When bacteria accumulate in lymph nodes (as in a bacterial infection), nodes become swollen and tender.

Spleen

• Organ similar in structure and function to a lymph node, but is much larger.

• Filters lymph.

• Manufactures lymphocytes and monocytes.

• Destroys old erythrocytes.

• Stores new erythrocytes for release into the bloodstream as needed.

• Not essential to life.
  • If spleen is removed, other organs take over its function.
The thymus secretes a hormone called **thymosin**.

- Thymosin stimulates red bone marrow to produce T lymphocytes (T cells).
- T cells provide a defense against disease.
  - Attack and destroy foreign or abnormal cells.
Tonsils

- Filter lymph.
- Destroy bacteria entering the mouth and throat.

Quick Quiz

1. What is the purpose of the lymphatic system?

2. What is the purpose of leukocytes?

Quick Quiz

3. What role does the hormone thymosin play in the lymphatic system?

4. What organ destroys bacteria entering the mouth and throat?
Define Combining Forms – page 183

• Aden/o:
• Agglutin/o:
• Immuno/o:
• Lymph/o:
• Lymphaden/o:

Immunosuppression

• immun/o: protection
• -suppression: to stop
• To stop protection

lymphadenopathy

• lymphaden/o: lymph node (gland)
• -pathy – disease condition
• Disease condition of lymph nodes.
Define Combining Forms

lymphangi/o:

Phag/o:

Splen/o:

Thym/o:

Define Suffixes

-oma:

-phylaxis:

-poiesis:

Build Medical Words

1. tumor of the thymus gland: __________/___

2. cell that swallows or eats (ingests):
   __________/________/

3. formation or production of lymph:
   __________/________/poiesis
Build Medical Words

4. tumor of a lymph vessel: ____/____

4. process of clumping, gluing: __/ation

5. study of immunity: ____/____/ogy

Build Medical Words

7. enlargement of the spleen:

8. tumor (composed of) lymph:

9. inflammation of a lymph gland (node):

Build Medical Words

10. disease of lymph glands:

11. specialist in the study of immunity:

12. tumor of the thymus gland:
Disorders of the Lymphatic System

anaphylaxis

- ana-: away from, backward, up, apart
- -phylaxis: protection

Away from protection
- An exaggerated, life-threatening, hypersensitivity reaction to foreign proteins
Immunodeficiency

- Acquired Immunodeficiency Syndrome (AIDS)
  - destroys T helper cells (CD4+ cells)
  - opportunistic infections
  - malignancies
    (Kaposi sarcoma, Wasting syndrome)

Kaposi Sarcoma

Opportunistic Infections with AIDS

- Candidiasis
- Cryptococcus (Crypto)
- Cryptosporidiosis
- Cytomegalovirus (CMV) infection
- Herpes simplex
- Histoplasmosis (Histo)
- Mycobacterium avium-intracellulare (MAI) infection
- Pneumocystis pneumonia (PCP)
- Toxoplasmosis (Toxo)
- Tuberculosis (TB)
HYPERSENSITIVITY

**Allergy:** abnormal sensitivity acquired by exposure to antigen

- Ranges from
  - allergic rhinitis or hay fever to anaphylaxis
- Other allergies:
  - atopic dermatitis
  - asthma
  - urticaria (hives)

MALIGNANCIES

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**Malignant tumor of lymph nodes and lymph tissue**

- originates in lymphocytes - (Reed-Sternberg cell in lymph nodes)

- also originates in lymphocytes, more common
MALIGNANCIES

_________________________
malignant tumor of bone marrow cells

_________________________
malignant tumor of the thymus

Abbreviations

- Acquired Immunodeficiency Syndrome

- Protein on T-cell helper lymphocyte that is infected with HIV in AIDS

- Enzyme-Linked Immunosorbent Assay
  - Test to detect anti-HIV antibodies

Abbreviations

- Human Immunodeficiency Virus
  - Causes AIDS

- Pneumocystis carinii pneumonia
  - Opportunistic AIDS-related infection

- T-cell lymphocyte that is destroyed by the AIDS virus (helper T cells)
**Abnormal accumulation of lymph, usually in the extremities.**

- Symptoms eventually include pallor, weakness, lymph node enlargement, fatigue, fever, and weight loss.

**Systemic Lupus Erythematosus (SLE)**

- Inflames and damages connective tissue anywhere in the body.

- Most commonly produces inflammation of skin, joints, nervous system, kidneys, lungs, and other organs.
Systemic Lupus Erythematosus (SLE)

Treatment:
- Anti-inflammatory drugs, including aspirin.
- Corticosteroids for severe cases.
- Sometimes antimalarials are added.
- Immunosuppressive agents when life-threatening or severe crippling disease is present.

Clinically Related Exercise
1. Ms. Z is diagnosed with systemic lupus erythematosus. The medical assistant charts the abbreviation as __________.

Clinically Related Exercise
3. Ms. Z suffers from SLE and states that aspirin is no longer working. The physician prescribes other drugs to reduce inflammation that are called (analgesics, antithyroids, corticosteroids).

4. When SLE becomes life threatening the physician may order drugs to suppress the immune system. These drugs are called (antithyroids, immunosuppressives, NSAIDs).
Vocabulary

lymphadenitis:

lymphocyte:

diagnostic procedures:

• Withdrawn for microscopic evaluation (usually from pelvic bone)
  • Used for stem cell transplant or chromosomal analysis.

Vocabulary

mononucleosis:

pathogen:

phagocyte:
Bone marrow aspiration

Used to determine if a known cancer, such as Hodgkin and non-Hodgkin lymphoma, has spread to the bone marrow.

- Part of staging process to determine if cancer has spread and how much has spread.

Diagnostic Procedures

ELISA

- Blood test that detects antibodies in blood
- Screening for an antibody to the AIDS virus

Tissue typing

- Used to determine histocompatibility of tissues.
- Used in grafts and transplants with recipient’s tissues and cells.

- Also known as histocompatibility testing.

Vocabulary

1. disease of a lymph gland:
2. tumor of lymph that is fleshy (cancerous):
3. process of recording lymph vessel(s):
Medical and Surgical Procedures

Bone marrow transplant
• Infusion of healthy bone marrow stem cells after diseased bone marrow is destroyed by chemotherapy or radiation.
  • Used to treat aplastic anemia, leukemia, and certain cancers.

Lymphangiectomy
• Excision of one or more lymphatic vessels, usually due to cancer.

Pharmacology

• Inhibit development of specific viruses.
  • Used to treat HIV infections and AIDS

• Suppress immune response to prevent organ rejection after transplantation.
• Slow progression of autoimmune disease.

Clinically Related Exercise

1. To prevent rejection of Mary's recently transplanted kidney, the physician prescribed a/an (anticoagulant, immunosuppressant, thrombolytic).

2. The American Medical Association (AMA) recommends vaccination of immune globulins to induce immunity to certain infectious diseases. These vaccinations are known as (anticoagulants, immunizations, immunosuppressants)
Clinically Related Exercise

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Clinically Related Exercise

3. To prevent the patient from contracting a viral infection, the physician prescribed a/an (corticosteroid, antiviral, immunosuppressant).

4. Treatment of HIV infection and AIDS includes the use of (corticosteroids, antivirals, immunosuppressants).