

Chapter 11: Lymphatic and Immune Systems

Building a Medical Terminology Foundation 2e – Student Companion by Kimberlee Carter; Marie Rutherford; and Connie Stevens

This book is intended as a companion to *Building a Medical Terminology Foundation 2e* (<https://ecampusontario.pressbooks.pub/medicalterminology2/>).

Table of Contents

- Lymphatic and Immune Systems
- Worksheet: Design Your Own Worksheet
- Activity: Definitions Using Word Parts

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Lymphatic and Immune Systems

If you would like to review the textbook chapter content, please visit **Chapter 11: Lymphatic and Immune Systems** [New Tab].

Learning Objectives

- Identify the anatomy and describe the main functions of lymphatic and immune systems
- Identify and describe the organization of the lymphatic system
- Analyze, translate, and define medical terms and common abbreviations of the lymphatic and immune systems
- Practice the spelling and pronunciation of lymphatic and immune system medical terminology medical terms of the lymphatic and immune systems
- Identify the medical specialties associated with lymphatic and immune systems and explore common diseases, disorders, diagnostic tests and procedures

Key Word Components

Identify meanings of key word components of the lymphatic and immune systems:

Prefixes

- a- (absence of, without)
- an- (absence of, without)
- ana- (up, upward or back, backward)
- brady- (slow)
- inter- (between)

- pan- (all)

Combining Forms

- immun/o (immune, immunity)
- lymph/o (lymph, lymph tissue)
- lymphaden/o (lymph gland, lymph node)
- myel/o (bone marrow, spinal cord)
- splen/o (spleen)
- thym/o (thymus gland)
- tox/o (poison)

Suffixes

- -ac (one affected with)
- -apheresis (withdrawal or removal)
- -cyte (cell)
- -ectomy (excision, cut out)
- -itis (inflammation)
- -logist (specialist, physician who studies and treats)
- -logy (study of)
- -megaly (enlarged, enlargement)
- -oid (resembling)
- -oma (tumor, swelling)
- -osis (abnormal condition)
- -pathy (disease)
- -penia (decrease, deficiency)
- -poiesis (formation, production)
- -rrhaphy (suturing)

Lymphatic and Immune Systems Words

Pronouncing and Defining Lymphatic and Immune Systems Medical Terms

Lymphatic System Medical Terms Not Easily Broken Down (Text Version)

Practice the following lymphatic system words by breaking into word parts and pronouncing.

1. **allergen**

- Substance capable of producing an allergic (hypersensitivity) reaction

2. **Allergist**

- Specialist who studies and treats allergies

3. **allergy**

- inflammatory response due to a hypersensitivity to a substance

4. **acute inflammation**

- Inflammation occurring for a limited time period, rapidly developing

5. **afferent lymphatic vessels**

- vessels that lead into a lymph node

6. **antibody**

- antigen-specific protein secreted by plasma cells, immunoglobulin

7. **antigen**

- molecule recognized by the receptors of b and t lymphocytes

8. **chronic inflammation**

- Inflammation occurring for long periods of time

9. **chyle**

- lipid-rich lymph inside the lymphatic capillaries of the small intestine

10. **efferent lymphatic vessels**

- vessels that lead out of a lymph node

11. **erythroblastosis fetalis**

- Also called HDN (hemolytic disease of newborn) disease of RH-positive newborns in RH-negative mothers with multiple RH-positive children. Resulting from the action of maternal antibodies against fetal blood.

12. **Graft-versus-host disease (GVHD)**

- In bone marrow transplants, occurs when the transplanted cells mount an immune response against the recipient

13. **immunological memory**

- ability of the adaptive immune response to mount a stronger and faster immune response upon re-exposure to a pathogen

14. **innate immune response**

- rapid but relatively non-specific immune response

15. **lymph**

- fluid contained within the lymphatic system

16. **lymph node**

- one of the bean-shaped organs found associated with the lymphatic vessels

17. **Severe combined immunodeficiency disease (SCID)**

- Genetic mutation that affects both t cell and b cell arms of the immune response

18. **Spleen**

- Secondary lymphoid organ that filters pathogens from the blood and remove degenerating or damage blood cells

19. **Thymus**

- Primary lymphoid organ, where t lymphocytes proliferate and mature

20. **Tonsils**

- Lymphoid nodules associated with the nasopharynx

21. **vaccine**

- An agent administered by injection, orally or nasal spray that provides active acquired immunity to a particular infectious disease.

22. **Apoptosis**

- Programmed Cell Death

23. **Bone Marrow**

- tissue found inside bones, the site of all blood cell differentiation and maturation of b lymphocytes

24. **Immunity**

- Post infection, memory cells remain in the body providing an immune response to the same

pathogen. This protects us from getting sick by the same pathogen

25. **Histamine**

- Vasoactive mediator in granules of mast cells
Primary cause of allergies and anaphylactic shock

26. **Inflammation**

- Immune response characterized by heat, redness, pain, and swelling

27. **Interstitial**

- Between cells of the tissues

28. **Interstitial Space**

- Spaces between individual cells in the tissues

29. **Passive Immunity**

- Transfer of immunity (usually by injection of antibodies) to a pathogen by an individual who lacks immunity.

Activity source: Endocrine System Medical Terms by Kimberlee Carter, from *Building a Medical Terminology Foundation* by Kimberlee Carter and Marie Rutherford, licensed under CC BY- 4.0. / Converted to Text.

Pronouncing and Defining Commonly Abbreviated Lymphatic and Immune Systems Terms

Practice pronouncing and defining these commonly abbreviated lymphatic and immune systems terms:

- AIDS (acquired immunodeficiency syndrome)
- CBC and Diff (complete blood count and differential)
- CD4+ Cell (helper T cell)
- CD8+ Cell (cytotoxic T cell)
- CMV (cytomegalovirus- causes opportunistic AIDS-related infection)
- Crypto (Cryptococcus- causes opportunistic AIDS-related infection)
- ELISA (enzyme-linked immunosorbent assay – test to detect anti-HIV antibodies)
- G-CSF (granulocyte colony-stimulating factor – cytokine that promotes neutrophil production)
- GM-CSF (granulocyte macrophage colony-stimulating factor – cytokine secreted by macrophages to promote growth of myeloid progenitor cells and their differentiation to granulocytes)
- GVHD (Graft-versus-host Disease)

- HAART (highly active antiretroviral therapy – use of combinations of drugs that are effective against AIDS)
- Hct (hematocrit)
- HDN (hemolytic disease of the newborn)
- Hgb (hemoglobin)
- Histo (histoplasmosis-fungal infection seen in AIDS patients)
- HIV (human immunodeficiency virus)
- HSV (herpes simplex virus)
- Iga, IgD, IgE, IgG, IgM (immunoglobulins)
- IL1 to IL38 (interleukins)
- IV (Intravenous)
- KS (Kaposi sarcoma)
- MAI (Mycobacterium avium-intracellulare (MAI) complex – group of pathogens that cause lung and systemic disease in immunocompromised patients)
- MoAb (monoclonal antibody)
- NHL (non-Hodgkin lymphoma)
- PCP (Pneumocystis pneumonia-opportunistic AIDS-related infection)
- PI (protease inhibitor)
- SCID (severe combined immunodeficiency)
- SPECT (single-photon emission computed tomography)
- Treg (regulatory T cell (suppressor T cell)
- Toxo (toxoplasmosis- parasitic infection associated with AIDS)
- WBC (White Blood Cell)

Sorting Terms

Sort the terms from the word lists above into the following categories:

- **Disease and Disorder** (terms describing any deviation from normal structure and function)
- **Diagnostic** (terms related to process of identifying a disease, condition, or injury from its signs and symptoms)
- **Therapeutic** (terms related to treatment or curing of diseases)
- **Anatomic** (terms related to body structure)

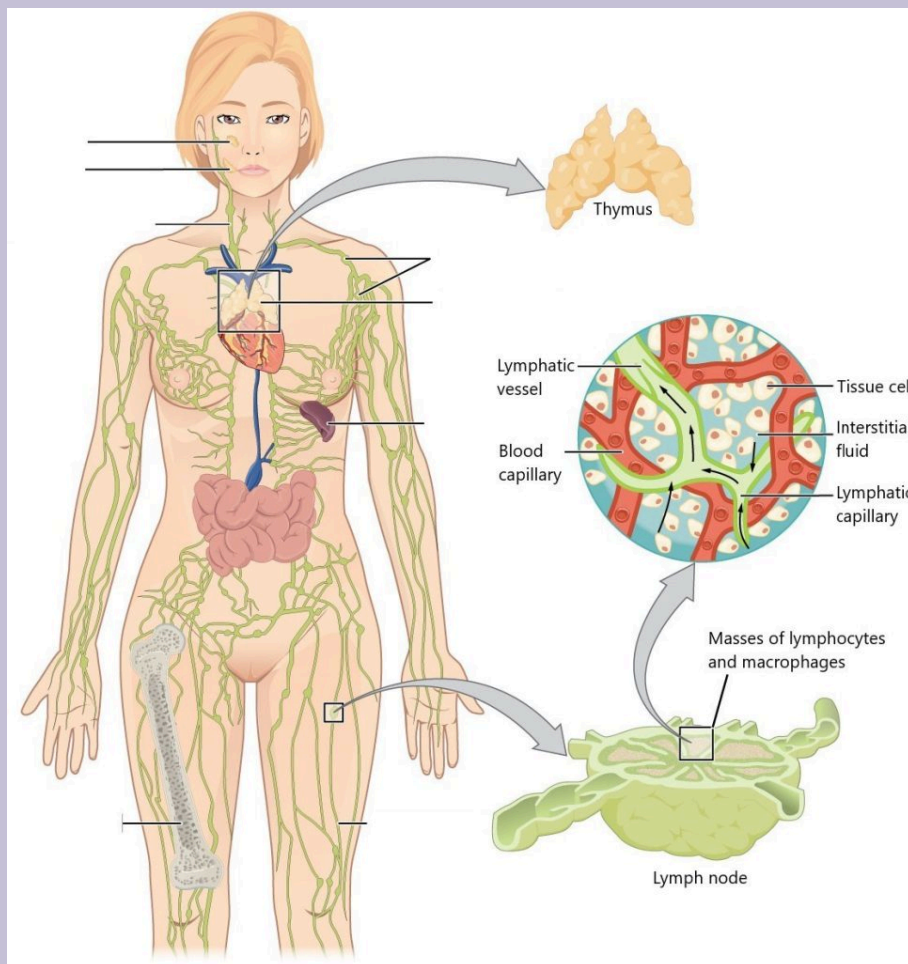
Lymphatic and Immune Systems Structures

Label the following lymphatic system anatomy:

Lymphatic System Anatomy (Text Version)

Label the diagram with correct words listed below:

- | | | |
|----------------|----------------|----------------------------------------|
| 1. Adenoid | 4. Thymus | 7. Right lymphatic duct, entering vein |
| 2. Lymph nodes | 5. Bone marrow | 8. Lymph vessel |
| 3. Tonsil | 6. Spleen | |



Lymphatic System Anatomy Diagram (Text Version)

The diagram shows a female human body standing upright, and the entire lymphatic system is shown and labeled (clockwise from top): The _____[Blank 1] is a small gland located in the centre of the chest and it is responsible for supporting the immune function by producing T-cells a type of white blood cell which fights infections and diseases. A collection of oval shaped structures known as _____[Blank 2] serve as filtration units. The _____[Blank 3] is an organ located under the left part of the diaphragm and is responsible for blood

filtration. Thin-walled tube known as a _____[Blank 4] carry lymph tissue throughout the body. The _____[Blank 5] is a primary site for T-cell activity in the lymphatic system. The _____[Blank 6] receives lymph fluid from the right side of the head, neck, and thorax, as it drains the venous system. Located at the back of the throat is a fleshy structure known as the _____[Blank 7] and serves as the first line of defence against inhaled harmful substances. Located in the nasopharyngeal region is the _____[Blank 8] which also filter and trap harmful substances from entering the body. The right panel shows magnified images of the thymus and the lymph node. Labels read (clockwise from top): tissue cell, interstitial fluid, lymphatic capillary, blood capillary, lymphatic vessel. Label of lymph node reads masses of lymphocytes and macrophages.

Check your answers ¹

Activity source: Lymphatic System Anatomy by Gisele Tuzon, from *Building a Medical Terminology Foundation*, illustration from *Anatomy and Physiology (OpenStax)*, licensed under CC BY 4.0./ Text version added.

Medical Terms in Context

Place the following medical terms in context to complete the scenario below:

Lymphatic System – Medical Report (Text version)

Fill in the following medical reporting using the words listed below:

- itchy
- runny
- allergies
- dander
- medications
- distress
- heart
- drainage
- Dyspnea
- rhinitis
- iron

PATIENT NAME: Sally WESSON

AGE: 43

SEX: Female

DOB: September 26

DATE OF ASSESSMENT: March 20

ATTENDING PHYSICIAN: Trevor Sharpe, MD

CHIEF COMPLAINT: Allergies.

HISTORY: A 43-year-old Asian female states being very tired and irritable. She had presented watery and _____[Blank 1] eyes, itchy throat, sneezing, _____[Blank 2] and stuffy nose. She has family history of _____[Blank 3]. She always struggled with many different allergies: dust, pollen, cat and dog _____[Blank 4]. She had tried different types of over-the-counter allergy _____[Blank 5], but they didn't help to alleviate the symptoms. She is currently taking Reactine 5 mg daily which does not relieve all of her symptoms.

PHYSICAL EXAMINATION: GENERAL: Patient is pale and in moderate _____[Blank 6]. VITAL SIGNS: Weight 160 pounds, B/P 120/80, _____[Blank 7] rate 90 beats per minute, respiratory rate 18 per minute, temperature 98.6 F. HEENT: EYES: Red, watery, itching, burning and swelling. EARS: Normal. NOSE: Mouth breathing, sneezing, runny and itchy nose, post-nasal _____[Blank 8], nasal congestion. THROAT: Itchy and swollen. CHEST: _____[Blank 9] and wheezing.

MEDICATIONS

1. Reactine 5 mg _____[Blank 10].
2. Escitalopram 20 mg q.d.
3. Lorazepam 0.5 mg p.r.n. nightly at bedtime.
4. Fenofibrate 145 mg q.h.s.

ASSESSMENT

1. Patient has severe seasonal allergic _____[Blank 11].
2. Possible anemia.

PLAN

1. Recommended Reactive 10 mg q.d.
2. Referred to an allergist to provide patient more options for allergy treatments.
3. Ordered a blood work to check her _____[Blank 12] and cholesterol levels.
4. Follow up in 4 days to review her blood work results.

Trevor Sharpe, MD

Note: Report samples (H5P and Pressbooks) are to encourage learners to identify correct medical terminology and do not represent the Association for Health Documentation Integrity (AHDI) formatting standards.

Check your answers:²

Activity source: “Lymphatic System – Medical Report” by Sheila Bellefeuille & Heather Scudder, from *Building a Medical Terminology Foundation* by Kimberlee Carter and Marie Rutherford, licensed under CC BY- 4.0. /Text version added.

Medical Terms in Context

Place the following medical terms in context to complete the scenario below:

Lymphatic System – Medical Report (Text version)

Fill in the following medical report using the words listed below:

- stones
- fatigued
- fever
- tonsillitis
- temperature
- cervical
- dysphagia
- erythema
- crypts
- tonsillolith
- pseudomembranes
- tonsillectomy
- gargles

PATIENT NAME: Celine CAMERON

AGE: 16

SEX: Female

DOB: March 25

DATE OF ASSESSMENT: August 4

ATTENDING PHYSICIAN: Grant Talbot, MD, Pediatrics

HISTORY: This is a 16-year-old female today with complaints of throat pain. She has been struggling with inflamed tonsils for the last 2 weeks. The patient claims that tonsil _____[Blank 1] are forming and that a white film has appeared over their tonsils. She has been feeling very _____[Blank 2], has developed a mild _____[Blank 3] and occasionally feel nauseous.

The client has a family history of _____[Blank 4] resulting in tonsillectomy. She mentioned that her grandmother experienced recurrent tonsillitis around the same age. The condition of tonsillitis has occurred on 2 other occasions in the past 5 months.

PHYSICAL AND EXAMINATION: Ms. Cameron is in no acute distress. She appears fatigued. VITAL SIGNS: Blood Pressure 132/83, _____[Blank 5] is slightly elevated at 99.6, pulse 67. She is in generally in good condition. Throat palpation was performed. There is significant enlargement of the _____[Blank 6] lymph nodes. She appears to be experiencing _____[Blank 7]. Throat was examined and revealed swelling, _____[Blank 8] and tonsillar _____[Blank 9] visible. A _____[Blank 10] was seen to be forming within one of the crypts. Celine's claims of _____[Blank 11] were also confirmed. She denies any symptoms such as a nasal discharge, cough, or abdominal pain. Throat was swabbed.

ASSESSMENT: Ms. Cameron appears to be experiencing recurrent tonsillitis correlated to exaggerated tonsillar crypts. Possible _____[Blank 12] may be required.

PLAN

1. Patient was given a referral to an ENT specialist and may require tonsillectomy.
2. The patient was instructed to follow a diet of soft, smooth foods and soothing liquids.
3. It was suggested that the patient use saltwater _____[Blank 13] in the mornings and before bed.
4. A prescription of Amoxicillin 400 mg p.o. p.c.

Grant Talbot, MD, Pediatrics

Note: Report samples (H5P and Pressbooks) are to encourage learners to identify correct medical terminology and do not represent the Association for Health Documentation Integrity (AHDI) formatting standards.

Check your answers: ³

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Medical Terms in Context

Place the following medical terms in context to complete the scenario below:

Lymphatic System – Medical Report (Text version)

Fill in the following medical report using the words listed below:

- dysphagia
- prescribed
- lymph
- enlarged
- ibuprofen
- erythromycin
- tonsillectomy
- surgery

PATIENT NAME: Jason MACDONALD

AGE: 7

SEX: Male

DOB: August 19

DATE OF ASSESSMENT: November 15

ATTENDING PHYSICIAN: Grant Talbot, MD, Pediatrics

DIAGNOSIS: Tonsillitis

HISTORY: This 7-year-old white male has been seen by me on several occasions over the last two years. He has complained of pharyngitis, _____[Blank 1], and fever. I have _____[Blank 2] erythromycin in the past.

PHYSICAL EXAMINATION: When I examined Jason today, he once again had the same complaints as in the past. I also noticed that the _____[Blank 3] nodes in his neck were _____[Blank 4] and tender. He had a temperature of 39 degrees.

TREATMENT: I gave Jason _____[Blank 5] for his fever and prescribed _____[Blank 6] again.

PLAN: It is my recommendation that Jason undergo a _____[Blank 7]. Jason's parents are in agreement. I will make the arrangements for Jason's _____[Blank 8].

Grant Talbot, MD, Pediatrics

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Check your answers: ⁴

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Test Your Knowledge

Test your knowledge by answering the questions below:

Lymphatic and Immune Systems Glossary Reinforcement Activity (Text version)

1. Vasoactive mediator in granules of mast cells and is the primary cause of allergies and anaphylactic shock is called _____[Blank 1].
 - a. Histamine
 - b. Mast cell
 - c. Cisterna chyli
2. Large duct that drains lymph from the lower limbs, left thorax, left upper limb, and the left side of the head is referred to as _____[Blank 2].
 - a. Thoracic duct
 - b. Lymph
 - c. Plasma cell
3. _____[Blank 3] is the primary lymphoid organ; where t lymphocytes proliferate and mature.
 - a. Lymphatic capillaries
 - b. Thymus

- c. Antigen
4. Tissue found inside bones; the site of all blood cell differentiation and maturation of b lymphocytes are called _____[Blank 4].
- a. Neutrophil
 - b. Interferons
 - c. Bone marrow
5. Ability of the adaptive immune response to mount a stronger and faster immune response upon re-exposure to a pathogen is called _____[Blank 5].
- a. Immunological memory
 - b. Chemokine
 - c. Barrier defenses

Check your answers: ⁵

Activity source: Lymphatic and Immune Systems Glossary Reinforcement Activity by Gisele Tuzon, from *Building a Medical Terminology Foundation* by Kimberlee Carter and Marie Rutherford, licensed under CC BY-4.0. / Text version added.

Downloadable Worksheets

View or download & print the PDF or Word format worksheet below:

Design Your Own Worksheet [New Tab]



An interactive H5P element has been excluded from this version of the text. You can view it online here:
<https://ecampusontario.pressbooks.pub/medicalterminology2studentworkbook/?p=325#h5p-59>

11. Lymphatic and Immune – Definitions [New Tab]

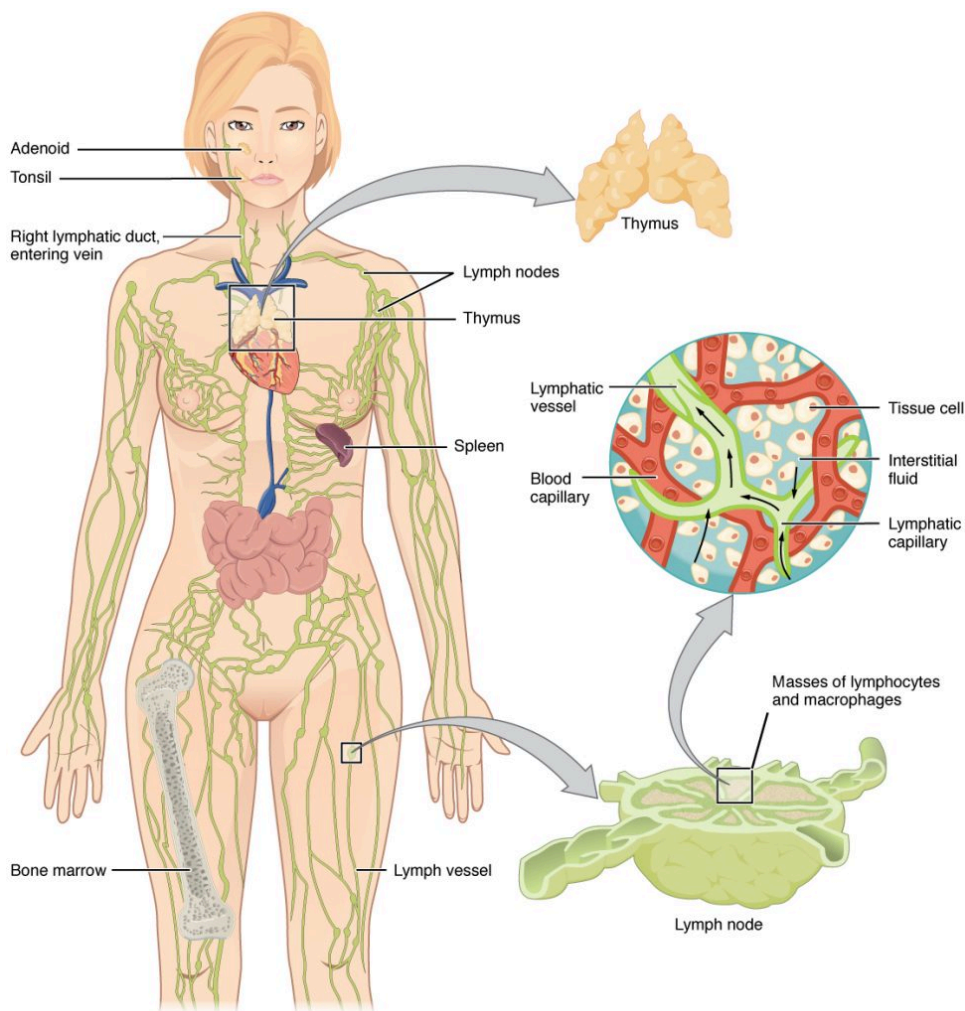


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Notes



1.

Check your answers:

Lymphatic System Anatomy Diagram (Text Version) The diagram shows a female human body standing upright, and the entire lymphatic system is shown and labeled (clockwise from top): The **thymus** is a small gland located in the centre of the chest and it is responsible for supporting the immune function by producing T-cells a type of white blood cell which fights infections and diseases. A collection of oval shaped structures known as **lymph nodes** serve as filtration units. The **spleen** is an organ located under the left part of the diaphragm and is responsible for blood filtration. Thin-walled tube known as a **lymph vessel** carry lymph tissue throughout the body. The **bone marrow** is a primary site for T-cell activity in the lymphatic system. The **right lymphatic duct entering vein** receives lymph fluid from the right side of the head, neck, and thorax, as it drains the venous system. Located at the back of the throat is a fleshy structure known as the **tonsil** and serves as the first line of defence against inhaled harmful substances. Located in the nasopharyngeal region is the **adenoids** which also filter and trap harmful substances from entering the body. The right panel shows magnified images of the thymus and the lymph node. Labels read (clockwise from top): tissue cell,

interstitial fluid, lymphatic capillary, blood capillary, lymphatic vessel. Label of lymph node reads masses of lymphocytes and macrophages.

2. 1. itchy, 2. runny, 3. allergies, 4. dander, 5. medication, 6. distress, 7. heart 8. drainage, 9. Dyspnea, 10. daily, 11. rhinitis, 12. iron
3. 1. stones, 2. fatigue, 3. fever 4. tonsillitis, 5. temperature, 6. cervical, 7. dysphagia, 8. erthema, 9. crypts, 10. tonsillolith, 11. pseudomembranes, 12. tonsillectomy, 13. gargles
4. 1. dysphagia, 2. prescribed, 3. lymph, 4. enlarged, 5. ibuprofen, 6. erythromycin, 7. tonsillectomy, 8. surgery
5. 1. Histamine 2. Thoracic duct, 3. Thymus, 4. Bone marrow, 5. Immunological memory.



Design Your Own Worksheet

Chapter: _____

Instructions

Work through the chapter and locate the prefixes and suffixes and add them to the table below with their meaning.

Prefixes and Suffixes

Prefix	Meaning	Suffix	Meaning

Abbreviations

Abbreviation	Meaning

Instructions

Locate the combining forms (root) from this chapter and include them below. Find medical terms in the chapter which use the combining form as part of the term and list and define them in the space provided below.

Locate chapter words without combining form. List them below.

Locate words from the chapter not built from word parts that you should memorize. List them below.

Definitions Using Word Parts



(Lymphatic and Immune)

Definitions Using Word Parts – Lymphatic and Immune

Instructions

Type the terms from the numbered list found below. For each term keyed, divide the combining form, suffix, and prefix with a slash to show the individual word parts. Then define the term in your own words according to the rules provided in the resource (reading from the suffix, then back to the beginning of the word, then across). Be sure to number each term in your document.

Example

hepat/itis - inflammation of the liver

Define the following terms by breaking into word parts:

1. Immunologist
2. Immunology
3. Phagocytosis