

# CHAPTER 15 – Lymphatic and Immune Systems

## *The Language of Immunology*

### *Chapter 15 Teaching Overview*

To understand the lymphatic and immune systems, students must first be clear about the three lines of defense the body has: physical mechanisms, cellular mechanisms, and humoral defense mechanisms based on antibodies. Important points about the lymphatic system students should master include the components of the lymphatic system, the functions of the lymphatic system, the differences between lymph and blood plasma, and where lymph travels (lymphatic ducts). Stress with students that the immune system is not an organ system, but a group of specialized cells. Discuss with students how the immune system can get weakened, as well as how it can be built back up. Also discuss what the mechanism of an autoimmune disease is and how it works.

As with all lessons in this Lesson Planning Guide, you can and should modify them to best meet the needs of *your* students, *your* schedule, and *your* curricula.

#### **Teacher to Teacher:**

- Start the class by asking if any students know people who have any of the diseases in the chapter to find out what their general personal knowledge is about the topics covered. This is an icebreaker for some students who know people with HIV, or other conditions/diseases. If you start this way, you can spark more interest in how this affects people, which will in turn make it a more interesting class.
- Introduce some celebrities or athletes who have had diseases discussed in this chapter (e.g., Magic Johnson with HIV, Michael J. Fox with Parkinson's, etc.). Ask students to consider how helpful it is to have a celebrity spokesperson for a disease.

### **Chapter 15: Learning Outcomes**

Upon successful completion of the lessons in this chapter, your students will . . .

- Apply the language of immunology to the anatomy and physiology of the lymphatic and immune systems.
- Comprehend, analyze, spell, and write the medical terms of immunology so that they communicate and document accurately and precisely in any health care setting.
- Recognize and pronounce the medical terms of immunology so that they can communicate verbally with accuracy and precision in any health care setting.
- Explain the effects of common lymphatic and immune system disorders on health.

**Note:** These lessons are designed with ultimate flexibility in mind. When customizing the lessons for your own class, always choose activities that are most relevant to your curriculum, your students, and your teaching goals—especially if you do not have time to implement all of the provided activities into your class period.

## **Lesson 15.1: Lymphatic System**



**Total Time:**  
50 Minutes

### **Lesson 15.1 Learning Objectives:**

Your teaching objective for this lesson is to help your students accomplish these learning objectives:

1. Describe the anatomy and flow of the lymphatic system.
2. List the functions of the lymphatic system.
3. Identify the major cells of the lymphatic system and their functions.
4. Detail the anatomy and functions of the lymph nodes, tonsils, thymus gland, and spleen.
5. Explain the effects of common disorders of the lymphatic system on health.

### **Prepare Your Materials:**

**Lesson 15.1 Lymphatic System Overview Handout** – Found on Instructor Resources, Online Resource Center, [www.mhhe.com/allanmedlanguage2e](http://www.mhhe.com/allanmedlanguage2e) in Lesson 15.1

**Computers with Internet access**

**Lesson 15.1 PowerPoint® presentation** – Found on Instructor Resources, Online Resource Center, [www.mhhe.com/allanmedlanguage2e](http://www.mhhe.com/allanmedlanguage2e)





in Lesson 15.1

**Lesson 15.1 Student Note-taking Handout** – Create by selecting the “Handouts” option when printing the PowerPoint presentation; select 3 slides per page to print slides with blank lines to the right where students can take notes





## Instructor Lesson Plan: Chapter 15, Lesson 15.1

### Instructor Lesson Plan Chapter 15—Lesson 15.1

Date: \_\_\_\_\_

	TIME 	ACTIVITY & INSTRUCTIONS 	MATERIALS 	OBJECTIVES 
<b>Warm-up &amp; Introduction</b>	15 min	<p><b>Activity Description:</b> Introducing and focusing students' interest on the lymphatic system.</p> <p><b>Step 1:</b> Tell students that while many people have heard of or know about diseases and disorders that affect the lymphatic system (Hodgkin's disease, tonsillitis) and many people have heard of or know about some of the components of the lymphatic system (tonsils and spleen), they may not know that all of these are part of a system called the lymphatic system.</p> <p><b>Step 2:</b> Distribute the Lesson 15.1 Lymphatic System Overview handout.</p> <p><b>Step 3:</b> Instruct students to visit the Internet sites listed on the handout and answer questions 1 through 4 to become familiar with the basics of the lymphatic system.</p> <p><b>Step 4:</b> Go over the answers to questions 1 through 4 as a whole group.</p> <p><b>Step 5:</b> Tell students to reflect on questions 5 and 6 of the handout and write their responses in the blanks.</p> <p><b>Step 6:</b> Ask students to share their prior knowledge of aspects of the lymphatic system as well as new things they have learned about the lymphatic system.</p> <p><b>Step 7:</b> Use the basics gained from this exercise as a springboard to the more in depth lecture/discussion portion of the lesson.</p>	<p>Lesson 15.1 Lymphatic System Overview Handout</p> <p>Computers with Internet access</p>	<p>LO 1 LO 2 LO 3 LO 4 LO 5</p>
<b>Lecture</b>	20 min	<p><b>Lesson 15.1 Lecture/Discussion</b> Reference the Speaker Notes for each slide to assist you in discussing the talking points. You can view or print "Notes Pages" to use during the lecture for easy reference (in PowerPoint, select "View," then "Notes Page").</p>	<p>Lesson 15.1 PowerPoint Presentation</p>	<p>LO 1 LO 2 LO 3 LO 4 LO 5</p>
<b>Active Learning &amp;</b>	15 min	<p><b>Activity Description:</b> Students will write a story utilizing medical</p>	<p>Textbook – Lesson 15.1</p>	<p>LO 1 LO 2</p>

## Instructor Lesson Plan: Chapter 15, Lesson 15.1

	TIME 	ACTIVITY & INSTRUCTIONS 	MATERIALS 	OBJECTIVES 
<b>Practice</b>		<p>terms from Lesson 15.1.</p> <p><b>Step 1:</b> Tell students it is time to activate their imaginations. Tell them they will write a story using at least 10 terms from Lesson 15.1.</p> <p><b>Step 2:</b> Take a minute or two to help students brainstorm story ideas. Tell them to think about how they might use dialogue (conversation), and what types of events might happen in their stories. Considerations:</p> <ul style="list-style-type: none"> <li>• If the story is based in a patient-type scenario, it should contain symptoms, some provisional diagnosis for a disease, possible orders for diagnostic tests or referral to a specialist.</li> <li>• Could incorporate a SOAP note: Subjective (patient), Objective (clinical person), Assessment (physician), Plan (physician).</li> <li>• Writing stories like this forces students to think through all of the facts that need to be in accurate, complete documentation.</li> </ul> <p><b>Step 3:</b> Give students time to write their stories.</p> <p><b>Step 4:</b> If there is time, allow students to share their stories with the rest of the class. Alternatively, if students need more time to finish the stories, they could be finished as homework.</p>		LO 3 LO 4 LO 5
<b>Review</b>	5 min	<p><b>Step 1:</b> Allow students to work in pairs to complete the three Lesson 15.1 textbook exercises.</p> <p><b>Step 2:</b> When students are finished, go over the answers to the exercises. Reinforce correct pronunciation while going over the answers.</p>	Textbook – Lesson 15.1 exercises	LO 1 LO 2 LO 3 LO 4 LO 5
<b>Homework Assignment</b>		<ul style="list-style-type: none"> <li>• Read Lesson 15.2 in the textbook.</li> <li>• Ask students to bring to the next class a newspaper or magazine article about someone with HIV/AIDS.</li> </ul>		

## Instructor Lesson Plan: Chapter 15, Lesson 15.1

### **Lesson 15.1 Masters**

- Lesson 15.1 Lymphatic System Overview Handout

### **Answers to Lesson 15-1 Masters**

- Lesson 15.1 Lymphatic System Overview Handout Answers

# Lymphatic System Overview: Chapter 15, Lesson 15.1

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## Medical Language for Modern Health Care:

### *Lesson 15.1 – Lymphatic System*

**Directions:** Using the Internet resources listed here, answer the general questions concerning the lymphatic system.

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#### **INTERNET RESOURCES:**

- Lymphatic Research Foundation (LRF) – <http://www.lymphaticresearch.org>
- InnerBody.com’s “Lymphatic System” section – <http://www.innerbody.com/> (select Lymphatic System upon entering the site)
- KidsHealth.org’s “Spleen and Lymphatic System” section – [http://www.kidshealth.org/parent/general/body\\_basics/spleen\\_lymphatic.html](http://www.kidshealth.org/parent/general/body_basics/spleen_lymphatic.html)

#### **INTRODUCTORY QUESTIONS:**

1. What is the lymphatic system?

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2. What body parts and areas contain lymphatic tissue?

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3. What are the main functions of the lymphatic system?

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4. What are some diseases or disorders that affect the lymphatic system?

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#### **REFLECTION QUESTIONS:**

5. What are two things you already knew about the lymphatic system even though you were not aware that they related to or were a part of this system before looking at the Internet resources?

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6. What are two new things you learned about the lymphatic system by looking at the Internet resources?

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7. What is lymph?

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# Answers to Lymphatic System Overview: Chapter 15, Lesson 15.1

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## Medical Language for Modern Health Care:

### *Lesson 15.1 – Lymphatic System – Answers*

**Directions:** Using the Internet resources listed here, answer the general questions concerning the lymphatic system.

#### **INTERNET RESOURCES:**

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- Lymphatic Research Foundation (LRF) – <http://www.lymphaticresearch.org>
- InnerBody.com's "Lymphatic System" section – <http://www.innerbody.com/> (select Lymphatic System upon entering the site)
- KidsHealth.org's "Spleen and Lymphatic System" section – [http://www.kidshealth.org/parent/general/body\\_basics/spleen\\_lymphatic.html](http://www.kidshealth.org/parent/general/body_basics/spleen_lymphatic.html)

#### **INTRODUCTORY QUESTIONS:**

**1. What is the lymphatic system?**

The lymphatic system is a circulatory network of organs, lymph nodes, lymph ducts, and lymph vessels that produce, store, and carry lymph to fight infection and disease.

**2. What body parts and areas contain lymphatic tissue?**

- Network of thin lymphatic capillaries and vessels that penetrates into the interstitial spaces of nearly every tissue in the body except cartilage, bone, red bone marrow, and the CNS.
- Group of tissues and organs (spleen, tonsils, thymus) that produce immune cells.

**3. What are the main functions of the lymphatic system?**

- To absorb excess interstitial fluid and return it to the blood stream.
- To remove foreign chemicals and cells and debris from the tissues.
- To absorb dietary lipids from the small intestine.

**4. What are some diseases or disorders that affect the lymphatic system?**

Lymphadenitis, lymphomas such as Hodgkin lymphoma and non-Hodgkin lymphomas, tonsillitis, ruptured spleen, edema, lymphedema.

#### **REFLECTION QUESTIONS:**

**5. What are two things you already knew about the lymphatic system even though you were not aware that they related to or were a part of this system before looking at the Internet resources?**

(Answers may vary)

**6. What are two new things you learned about the lymphatic system by looking at the Internet resources?**

(Answers may vary)

**7. What is lymph?**

Lymph is a clear, colorless fluid similar to blood plasma, but whose composition varies from place to place in the body. Lymph flows through the network of lymphatic capillaries and vessels.

## Lesson 15.2: Immune System



**Total Time:**  
50 Minutes

### **Lesson 15.2 Learning Objectives:**

Your teaching objective for this lesson is to help your students accomplish these learning objectives:

1. Define the immune system and its specificity.
2. Contrast cellular and humoral immunity.
3. Describe the life histories of B cells and T cells.
4. Explain the structure and actions of antibodies.
5. Discuss some common disorders of the immune system, including HIV and AIDS.

### **Prepare Your Materials:**

**Lesson 15.1 Review Crossword Puzzle** – Create using terms from Lesson 15.1 (a quick search on the Internet will yield many sites at which you can type in your own terms and definitions and have a crossword puzzle generated automatically)

**Articles about people with HIV/AIDS** (to be brought in by students as per the Lesson 15.1 homework assignment)

**Lesson 15.2 PowerPoint® presentation** – Found on Instructor Resources, Online Resource Center, [www.mhhe.com/allanmedlanguage2e](http://www.mhhe.com/allanmedlanguage2e)

in Lesson 15.2

**Lesson 15.2 Student Note-taking Handout** – Create by selecting the “Handouts” option when printing the PowerPoint presentation; select 3 slides per page to print slides with blank lines to the right where students can take notes

**Lesson 15.2 B Cell/T Cell Handout** – Found on Instructor Resources, Online Resource Center, [www.mhhe.com/allanmedlanguage2e](http://www.mhhe.com/allanmedlanguage2e)

in Lesson 15.2







## Instructor Lesson Plan: Chapter 15, Lesson 15.2





### Instructor Lesson Plan

Date: \_\_\_\_\_





### Chapter 15—Lesson 15.2

	TIME 	ACTIVITY & INSTRUCTIONS 	MATERIALS 	OBJECTIVES 
<b>Warm-up &amp; Review</b>	10 min	<p><b>Step 1:</b> Distribute the Lesson 15.1 Review Crossword Puzzle to students.</p> <p><b>Step 2:</b> Have students work on this crossword puzzle as individuals or in pairs.</p> <p><b>Step 3:</b> When students are finished, go over the correct answers to ensure understanding.</p>	Lesson 15.1 Review Crossword Puzzle	(Review Lesson 15.1 concepts)
<b>Introduction</b>	5 min	<p><b>Activity Description:</b> Examine the articles on people with HIV/AIDS brought in by students.</p> <p><b>Step 1:</b> Ask students to share with the class the articles on people with HIV/AIDS they were able to find in magazines and newspapers.</p> <p><b>Step 2:</b> Inform students that HIV and AIDS are disorders of the immune system, and that it is important for them to understand the structure, function, and pathology of this system to be able to communicate effectively in a health care setting.</p>	Articles on people with HIV/AIDS (to be brought in by students as per the Lesson 15.1 homework assignment)	LO 5
<b>Lecture</b>	20 min	<p><b>Lesson 15.2 Lecture/Discussion</b> Reference the Speaker Notes for each slide to assist you in discussing the talking points. You can view or print “Notes Pages” to use during the lecture for easy reference (in PowerPoint, select “View,” then “Notes Page”).</p>	Lesson 15.2 PowerPoint Presentation	LO 1 LO 2 LO 3 LO 4 LO 5
<b>Active Learning &amp; Practice</b>	10 min	<p><b>Activity Description:</b> Students will create a commercial to educate the public about HIV and AIDS.</p> <p><b>Step 1:</b> Organize students into groups of 3 to 5.</p> <p><b>Step 2:</b> Ask students if they have ever seen advertisements or public service announcements on television that educate people about diseases or disorders. Examples may include anti-smoking commercials, anti-drug public service announcements, heart attack or stroke public service announcements, etc.</p>		LO 1 LO 4 LO 5

## Instructor Lesson Plan: Chapter 15, Lesson 15.2

	TIME 	ACTIVITY & INSTRUCTIONS 	MATERIALS 	OBJECTIVES 
		<p><b>Step 3:</b> Discuss with students the characteristics of such an advertisement or public service announcement. These types of announcements/ads tend to:</p> <ul style="list-style-type: none"> <li>• Cover the necessary “who, what, when, where, and why” information</li> <li>• Concentrate on ONE main message</li> <li>• Incorporate sound or visuals</li> <li>• Speak directly to the audience (“YOU must...,” not “PEOPLE must...”)</li> <li>• Begin by getting the audience’s attention</li> <li>• Use active verbs</li> <li>• Be brief, yet informative</li> <li>• Be interesting and eye-catching</li> </ul> <p><b>Step 4:</b> Allow students to work together to write up a plan for their public service announcement or advertisement. Tell students that more than one person can appear in the commercial (e.g., the commercial could feature dialogue or conversation). Give students a time or word range (e.g., 2 to 4 minutes; 200 to 500 words, etc.) to focus their efforts.</p> <p><b>Step 5:</b> Have each group present their public service announcement or advertisement to the rest of the class.</p> <p>Option: Allow students to vote for best commercials in several “categories” and award prizes. Examples may include most informative, funniest (yet still informative), most creative, and so on. You could print up or create an “award certificate” for each category to bestow upon the winners.</p>		
<b>Review</b>	5 min	<p><b>Step 1:</b> Have students complete the Lesson 15.2 exercises as individuals.</p> <p><b>Step 2:</b> When they are finished, ask students to switch papers (or have them check their own answers) and go over the answers. Ensure understanding and emphasize correct usage, spelling, and pronunciation.</p>	Textbook – Lesson 15.2 exercises	LO 1 LO 2 LO 3 LO 4 LO 5
<b>Homework Assignment</b>		<ul style="list-style-type: none"> <li>• Complete the Chapter 15 Review exercises.</li> <li>• Review the Word Analysis and</li> </ul>		

## Instructor Lesson Plan: Chapter 15, Lesson 15.2

	TIME	ACTIVITY & INSTRUCTIONS	MATERIALS	OBJECTIVES
				
		Definition tables from the Chapter 15 lessons.		

### Lesson 15.2 Masters

(none)

