38a A&P: Lymphatic System and Immunity

38a A&P: Lymphatic System and Immunity Class Outline

5 minutes	Attendance, Breath of Arrival, and Reminders
10 minutes	Lecture:
25 minutes	Lecture:
15 minutes	Active study skills:
60 minutes	Total

38a A&P: Lymphatic System and Immunity Class Reminders

Assignments:

- 41a Review Questions (Packet A: 165-178)
- 43a Swedish: Outside Massages (Packet A: 57-62) Emailed to your instructor. Then log into classmarker, type your name in the answer box, and then hit submit. Assignment must be 4 pages total- 2 case studies/OMF forms and 2 SOAP notes.

Quizzes:

- 42a Quiz (35a, 36a, 37a, 38a, 39a, 40a, and 41a)
- 42b Kinesiology Quiz
 - (adductor magnus, gracilis, iliopsoas, sartorius, TFL, piriformis, quadratus femoris)
- 44a Quiz (33b, 37b, 41b, 42b, and 43a)

Practical Exam:

• 44b Integration Massage: Practical Exam (60-minute Swedish, Passive Stretches, and BMTs)

Preparation for upcoming classes:

- 39a Pathology: Lymph and Immune System
 - Packet E: 79-82
 - RQ Packet A-173
- 39b BMTs: Technique Demo and Practice Supine
 - Packet F: 83-84

Classroom Rules

Punctuality - everybody's time is precious

- Be ready to learn at the start of class; we'll have you out of here on time
- Tardiness: arriving late, returning late after breaks, leaving during class, leaving early

The following are not allowed:

- Bare feet
- Side talking
- Lying down
- Inappropriate clothing
- Food or drink except water
- Phones that are visible in the classroom, bathrooms, or internship

You will receive one verbal warning, then you'll have to leave the room.

Sartorius Trail Guide, Page 326

Sartorius is the longest muscle in the body.

It travels from the ASIS to the medial knee.

The slender belly of sartorius is entirely superficial, but it is still difficult to palpate.

Sartor means tailor in Latin.

This refers to the ability of sartorius to bring the thigh and leg into the position a tailor would use when sewing.

Anteromedial View

B.O.D

A Flex the hip (coxal joint)

Laterally rotate the hip (coxal joint)

Abduct the hip (coxal joint)

Flex the knee (tibiofemoral joint)

Medially rotate the knee (tibiofemoral joint)

Anterior superior iliac spine (ASIS)







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Medially rotate the knee (tibiofemoral joint)

Anterior superior iliac spine (ASIS)



Proximal, medial shaft of the tibia at pes anserinus tendon





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Tensor Fasciae Latae Trail Guide, Page 324



Tensor fasciae latae is a small, superficial muscle.

Approximately 3 fingers wide, the TFL is located on the lateral side of the upper thigh.

Tensor means *something that stretches*.

Fasciae means band or bandage.

Latae means broad.

"Broad band that stretches or adds tension"

A Flex the hip (coxal joint)

Medially rotate the hip (coxal joint)

Abduct the hip (coxal joint)



Iliac crest, posterior to the ASIS







Flex the hip (coxal joint)

Medially rotate the hip (coxal joint)

Abduct the hip (coxal joint)



Iliac crest, posterior to the ASIS







Flex the hip (coxal joint)

Medially rotate the hip (coxal joint)

Abduct the hip (coxal joint)



Iliac crest, posterior to the ASIS







Flex the hip (coxal joint)

Medially rotate the hip (coxal joint)

Abduct the hip (coxal joint)

Iliac crest, posterior to the ASIS

I Iliotibial tract



Lateral View

Flex the hip (coxal joint)

Medially rotate the hip (coxal joint) Abduct the hip (coxal joint)

Iliac crest, posterior to the ASIS

I Iliotibial tract



Lateral View

Iliotibial Tract Trail Guide, Page 324

Iliotibial tract is a superficial sheet of fascia.

Its vertical fibers stretch between the iliac crest and the tibial tubercle.

Both TFL and gluteus maximus have insert into the IT tract.



B.O.D.

38a A&P: Lymphatic System and Immunity

E - 75



Anatomy

Lymph Lymph vessels Lymph glands, such as the <u>thymus</u>. Lymphatic organs, such as the <u>spleen</u>. Lymph nodes Lymphocytes





Transportation Immune response Maintain homeostasis



Transportation The process of transporting dietary proteins, lipids, and lipid-soluble vitamins such as A, D, E, and K from the <u>digestive</u> tract to the blood.





Immune response The process of active immune defense.





Maintains homeostasis The process of collecting accumulated <u>tissue</u> fluid and returning it to blood circulation. This maintains blood volume, blood pressure, and prevents edema (swelling).



Lymph

Lymph Liquid connective tissue that is part of the lymphatic system. Nearly colorless fluid. Chemically it is very similar to blood <u>plasma</u>.
Contains white blood cells, proteins, and fats.





Lymph capillary Lymph vessel Lymphatic trunk Lymphatic duct



From Patton KT, Thibodeau GA: Anatomy & physiology, ed 7, St. Louis, 2010, Mosby.



Lymph capillary Tiny, <u>open</u>-ended channel located in tissue space throughout most of the body.





Lymph vessel Larger vessels than a lymph capillary. Has <u>thinner</u> walls and more <u>valves</u> than veins. Has lymph nodes situated along them.





Lymphatic trunk Made up of large vessels into which lymph is drained from the lymph vessels.





Lymphatic duct The joining of lymphatic trunks. Examples:

- Right lymphatic duct drains the right side of the head, right arm, and right torso (in green)
- Thoracic duct drains the rest of the body.









Red bone marrow Lymphocyte Thymus Spleen Lymph node Mucosa-associated lymphoid tissue



Red bone marrow Blood forming cells found in flat and long bones. Produce red blood cells, platelets, and white blood cells (specifically lymphocytes called B cells).





Lymphocyte Type of white blood cell. Examples: B cell, T cell, macrophage





Thymus Bi-lobed gland posterior to the <u>sternum</u>. Secretes thymosin and thymopoietin, which stimulate the production and activation of T cells.





Spleen Largest lymphatic organ. Located within the left lateral rib cage just posterior to the stomach. Stores <u>lymphocytes</u>, releasing them during immune responses.





Lymph nodeBean-shaped structures located along lymph vessels . Filterslymph. Houses phagocytes and lymphocytes that destroy pathogens andotherforeign substances in the lymph before it returns to the blood.







Mucosa-associated lymphoid tissue (AKA: MALT) Small masses of lymph <u>tissue</u> in respiratory and digestive tracts. Examples: tonsils, Peyer patches, and vermiform appendix.





Lymphatic drainage Lymphatic pump



Lymphatic drainage The <u>movement</u> of lymph.





Lymphatic pump The mechanism of lymphatic drainage that uses pressure gradients from external sources exerted on its vessel walls to move lymph.

Examples:

- Skeletal muscle contractions against vessel walls
- Pressure changes in the thorax and abdomen during <u>breathing</u>.
- Pulling of the skin and fascia during <u>movement</u>.
- Contraction of smooth muscle in the walls of lymphatic vessels
- Rhythmic pumping of <u>walking</u> and grasping.







Non-specific immunity Infection Inflammation

> Specific immunity T cells B cells



Immunity Reaction that involves <u>all</u> body systems as they join together to destroy and eliminate pathogens, foreign substances, or toxic materials.





Non-specific immunity (AKA: innate immunity) Non-specific response to invading pathogens. Includes intact skin and mucous membranes, saliva, gastric juices, vomiting, urine flow, certain white blood cells, fever, and inflammation.



Specific immunity (AKA: adaptive immunity) Body's response to invaders. T cells and B cells become activated for a specific pathogen after they come into contact with it and then destroy it.



T cells Lymphocytes that begin as <u>B</u> cells that migrate from bone marrow to the thymus where they fully mature. They recognize pathogens and respond by releasing inflammatory and toxic substances.





B cells Lymphocytes that grow and mature in the bone marrow. Produce <u>antibodies</u> which circulate in body fluids such as blood and lymph. Their antibodies inactivate pathogens as they come across them.



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