Pathology Class 2:

Immune Response and Microbial Challenge – Friends, Foes, and Allergies

Pre-Assessment Quiz: Pathology Week 2 (Ages 14-18yo)

1. Which description best defines inflammation?
a) A disease caused by infection
b) **A coordinated biological response to injury or threat**
c) A failure of the immune system
d) Permanent tissue damage

2. Which of the following is NOT one of the four cardinal signs of inflammation?
a) Redness
b) Swelling
c) **Itching**
d) Pain

3. What is the key difference between edema and tumor (swelling)?
a) **Edema is fluid accumulation, while tumor is increased tissue mass**
b) Tumor always means cancer
c) Edema only occurs with infection
d) Tumor is always painful, edema is not

4. Which inflammatory mediator is responsible for fast, itchy reactions like a bee sting?
a) Prostaglandins
b) Complement proteins
c) Cytokines
d) **Histamine**

5. Which immune cells act as rapid "first responders" during acute inflammation?
a) Lymphocytes
b) **Neutrophils**
c) Plasma cells
d) Regulatory T cells

6. Which immune cell is most important for presenting antigen information and activating adaptive immunity?
a) Mast cells
b) Neutrophils
c) **Dendritic cells**
d) Eosinophils

7. Which statement best distinguishes innate immunity from adaptive immunity?
a) Adaptive immunity does not involve cells
b) Adaptive immunity is always faster

c) Innate immunity uses antibodies
d) **Innate immunity is fast and non-specific, adaptive immunity is specific and learned**

8. Which hypersensitivity reaction type explains a poison ivy rash?
a) Type I
b) Type II
c) Type III
d) **Type IV**

9. What does virulence describe in microbiological pathology?
a) Whether a pathogen is bacterial or viral
b) **How much damage a pathogen can cause**
c) How easily a pathogen spreads
d) How long a pathogen survives outside the body

10. Which statement best summarizes a core concept from Pathology Week 2?
a) Inflammation should always be suppressed
b) Strong immune responses are always beneficial
c) Pathogens alone determine disease outcomes
d) **Disease results from interactions between pathogens, immune responses, and internal balance**

Home Activity – Answer Keys

Matching Game #1 - ANSWER KEY

Column A: Scenario	Column B: Immune Cell or Mediator, or reaction type
1. A mosquito bite that becomes ***itchy***, red, and swollen within minutes	Histamine
2. A fresh cut that quickly becomes red and warm with early inflammation	Neutrophils
3. A virus is actively infecting cells, triggering precise immune killing (programmed cell death, apoptosis; the executioners). Quiet. Precise. Surgical.	Cytotoxic T Cells (CD8+)
4. A poison ivy rash that appears 1-3 days (delayed) after exposure due to T-cell driven inflammation	Type IV (4) hypersensitivity reaction
5. ***Fever*** and ***fatigue*** during a bad flu	Cytokines
6. A bacterial skin infection with pus (the immune cleanup crew is active)	Macrophages
7. Parasites, chronic allergies (hay fever), and food allergies	Eosinophils
8. ***Pain*** and tenderness at the site of a sprained ankle	Prostaglandins
9. Being exposed to a virus you've had before, and antibodies are released from this adaptive immune cell to stop the infection faster this time.	Plasma cells (derived from B cells)
10. Early immune "messenger" cells carrying information to lymph nodes	Dendritic Cells
11. A first-line defense killing of suspicious (stressed or virus-infected cells) before antibodies are made	Natural Killer (NK) Cells
12. Swelling and redness around a bee sting within minutes	Mast Cells

Matching Game #2 - ANSWER KEY

Column 1: Common Condition	Correct Immune Pattern Description
1. A fresh cut that becomes red and warm	Innate immune response with neutrophils and increased blood flow
2. A cold with fatigue and fever	Viral infection triggering cytokines, fatigue, and immune system activation
3. A bee sting that itches and swells	Antibody-mediated allergic reaction with mast cells and histamine
4. Poison ivy rash	Delayed, T-cell driven hypersensitivity reaction with cytokine signaling
5. Athlete's foot	Fungal infection involving slow-growing organisms and macrophage involvement
6. Acne flare	Chronic inflammation involving hair follicles with repeated immune activation
7. Peanut allergy	Type I hypersensitivity reaction with rapid histamine release
8. Autoimmune disease (ex: lupus, Hashimoto's, type 1 diabetes)	Chronic immune misdirection where the immune system targets self-tissue