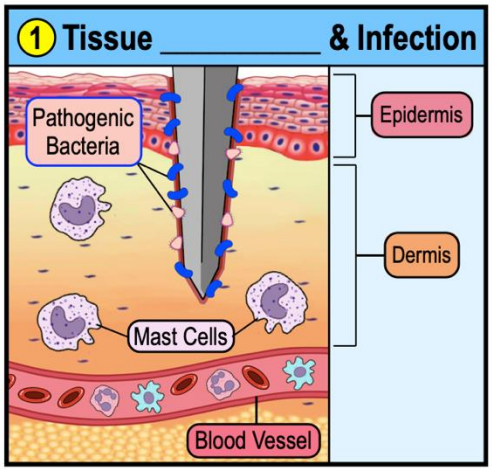
CONCEPT: STEPS OF THE INFLAMMATORY RESPOSNSE

●A series of _____ events occur in the inflammatory response during tissue damage & infection.

1) Tissue Damage & Infection

●Damage to tissue allows microbes to bypass the _____-line defenses & enter surrounding tissue cells.

□ Immediately after injury, blood vessels *briefly* _____ via **vasoconstriction,** to prevent blood loss.

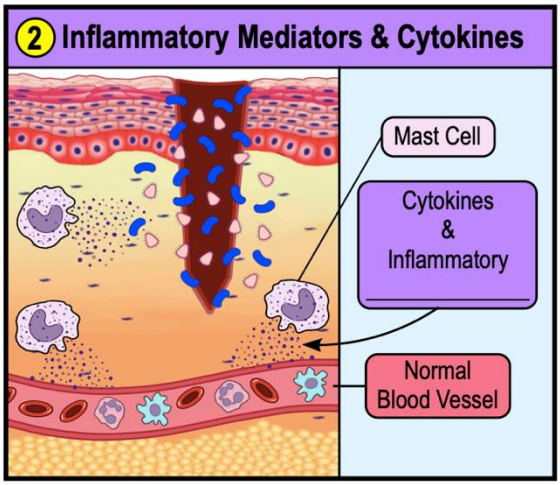


2) Release of Inflammatory Mediators & Other Cytokines

●In response to microbe invasion, local _____ cells release *cytokines & inflammatory mediators*.

□ **Inflammatory Mediators:** _____ molecules involved in the inflammatory response (Ex. *Histamine*).

□ Regulate changes in local blood vessels & signal immune cells from the blood to the infected site.



PRACTICE: In the inflammatory response, which immune cells are the first to begin the immune response to an injury?

a) The neutrophil cells are the first to respond to the injury and begin removing invading microbes.

b) The mast cells release inflammatory mediators to recruit other immune cells to the injury site.

c) The macrophages release histamine to dilate the blood vessels allowing immune cells to enter the injury site.

CONCEPT: STEPS OF THE INFLAMMATORY RESPOSNSE

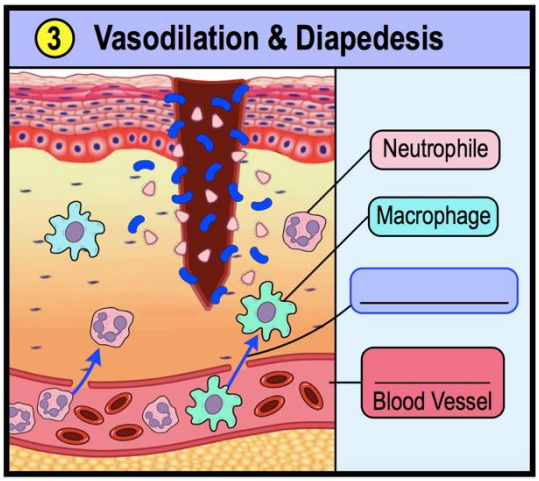
3) Vasodilation

●**Vasodilation:** dilation of blood vessels that _____ their permeability in response to *inflammatory mediators*.

□ **Diapedesis:** *migration* of immune cells through the intact walls of blood vessels into the infected tissue.

□ _____**:** fluid mix of blood plasma, proteins, & immune cells that exit bloodstream to infected site.

□ *Recall:* Neutrophils are the _____ type of phagocytes recruited.



PRACTICE: Which of the following is needed for vasodilation and diapedesis to occur at an infection site?

a) Mast cells releasing histamines and cytokines to dilate the blood vessels & recruit immune cells.

b) Adhesion proteins on the endothelial cells of the blood vessels allowing the immune cells to leave the blood stream.

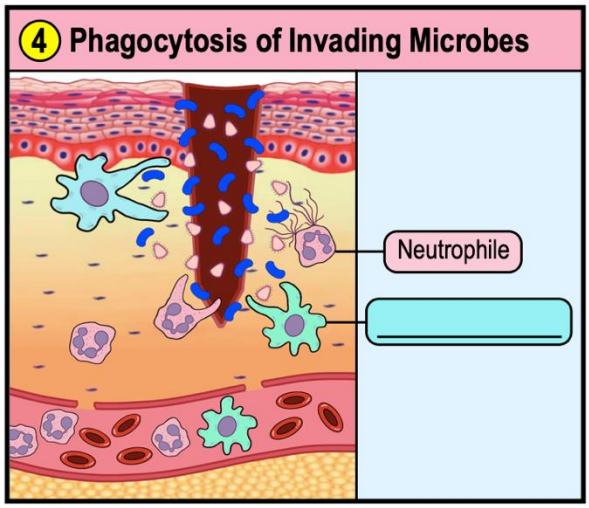
c) Exudate full of blood, plasma, proteins and immune cells exiting the blood stream to the infection site.

d) All are needed for vasodilation and diapedesis to occur at the site of an infection.

4) Removal of Invading Microbes

●Phagocytic cells from the blood destroy/_____ invading microbes.

□ Neutrophils remove microbes & macrophages _____ dead cells in the area.



CONCEPT: STEPS OF THE INFLAMMATORY RESPOSNSE

PRACTICE: Which immune cells are responsible for removing dead or damaged host material at an injury site?

a) Macrophages.
b) Mast cells.
c) Neutrophils.
d) Platelets.

PRACTICE: Match the scenario to the step of the inflammatory response it belongs in.

1. Tissue Damage & Infection.
2. Release of Inflammatory Mediators & Cytokines.
3. Vasodilation and Diapedesis.
4. Removal of Invading Microbes and Damaged Tissue.

_____ Local mast cells release histamines and cytokines when encountering an invading microbe.
_____ Neutrophils destroy the invading microbes found in the injury site.
_____ Peter accidentally cuts his finger with a kitchen knife.
_____ Fluid full of plasma, proteins and immune cells exits the blood stream at injury site.
_____ Macrophages remove the epidermis and dermis cells damaged by the injury.
_____ The blood vessels in the region of the injury dilate releasing immune cells and proteins.
_____ Pathogenic bacteria enter the host's body.

PRACTICE: The attraction of leukocytes to the area on inflammation is referred to as

a) Parasitism.
b) Infection.
c) Phototaxis.
d) Chemotaxis.

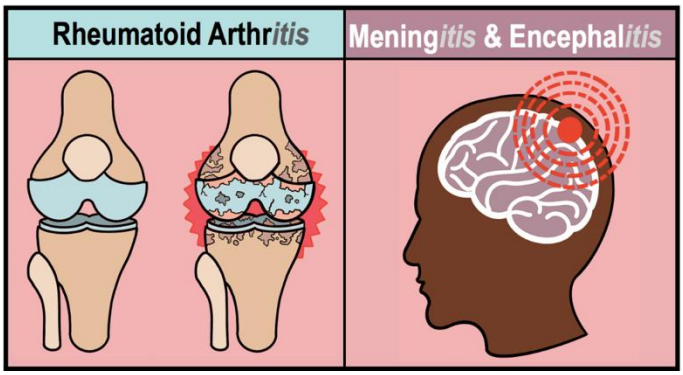
CONCEPT: STEPS OF THE INFLAMMATORY RESPOSNSE

Damaging Effects of the Inflammatory Response

●Although inflammation is designed to eliminate microbes, sometimes it can result in significant damage to the _____.

□ Depending on the location in the host, inflammation can be life threatening.

□ The suffix -_____ in many disease names means inflammation (Ex. *meningitis* or *encephalitis*).



PRACTICE: Which of the following statements about the inflammatory response is *false*?

a) It includes vasodilation of the blood vessels and the release of immune cells from the blood stream.
b) Neutrophils are the first cells to exit the blood stream during the inflammatory response.
c) Apoptosis of infected cells triggers the inflammatory response.
d) Chronic triggering of the inflammatory response can damage the host.
e) Major signs of inflammation include: redness, swelling, heat, pain, and loss of function.

PRACTICE: Rheumatoid arthritis is an autoimmune disease, meaning that the body's immune system attacks the body's joint tissues. Why are many autoimmune diseases associated with chronic inflammation?

a) The tissues the immune system is "fighting" are always present, so the inflammatory response does not shut off.
b) The invading microbes are not easily killed and keep reforming causing chronic inflammation.
c) The invading virus goes dormant in the body and later reemerges causing prolonged periods of inflammation.

PRACTICE: Which of the following is FALSE in regards to inflammation?

a) It is a component of the second line of defense.
b) It is caused by antibody-antigen complexes.
c) It is a component of the first line of defense.
d) It can be caused by endotoxins.