

Functional Hyperemia vs Reactive Hyperemia

Reactive:

Reactive hyperemia is the transient increase in organ blood flow that occurs following brief ischemia (or occlusion). Ie: removal of a tourniquet, TIA, or unclamping an artery during surgery. When the occlusion is released, blood flow rapidly increases and hyperemia occurs. During the period of occlusion, the lack of gas exchange in the capillaries triggers a metabolic vasodilator (ie: adenosine) to decrease vascular resistance. This allows the tissues to become re-oxygenated.

Functional:

Functional hyperemia is the increase in organ blood flow that is associated with increased metabolic activity of an organ or tissue (ie; muscle contraction). Blood flow increases because the increased oxygen consumption during muscle contraction stimulated the production of vasoactive substances that dilate vessels and decrease resistance. In a rested state, the blood is able to pump 5 L/min and up for 40 L/min during exercise for an advanced athlete. During exercise, the body redirects a majority from the blood flow to nourish the skeletal muscles. Functional hyperemia may be due to a combination of tissue hypoxia and the generation of vasodilator metabolites such as prostaglandins, histamine, serotonin, complement proteins, bradykinin, thrombin, nitric oxide, adenosine, ROS and potassium ions. *It is important to note that not all muscle fiber types are designated together and one unit may have multiple capillaries