Taken from *Strength and Conditioning.com*

[The Three Steps of Tissue Repair](http://strengthandconditioningcertification.com/2011/01/the-three-steps-of-tissue-repair/)

There are three steps involved in tissue repair. The most important part of tissue repair is the need for cells to divide and migrate. Injured cells release growth factors that are basically wound hormones. These hormones set into motion the repair of the damaged tissues. Repair occurs by regeneration and by fibrosis. The type of tissue damaged and the severity of the damage determines whether the tissue will undergo regeneration or fibrosis. Regeneration is replacement of destroyed tissue with the same type of tissue. Fibrosis is the proliferation of fibrous connective tissue otherwise called scar tissue.

The first step in tissue repair is inflammation. When tissues are injured inflammation occurs. This is because the tissue trauma causes the injured tissue cells, macrophages, mast cells and others in the area to release inflammatory chemicals. These chemicals cause the capillaries to dilate and become permeable. The now dilated and permeable capillaries make it easy for the white blood cells and plasma fluid that is rich in clotting proteins and antibodies to more easily seep into the injured area. The clotting proteins help to stop the loss of blood and hold the edges of the wound together. These proteins also create an effective barrier that prevents bacteria and other toxins from spreading to surrounding tissues. A scab soon forms on the part of the clot that is exposed to air.

The second step in tissue repair occurs simultaneously with the first step. While the inflammatory process is occurring, the organization process restores the blood supply. The blood clot that was formed is replaced with a delicate pink tissue called granulation tissue. This tissue contains capillaries that grow in from nearby areas and lay down a new capillary bed. These capillaries are very fragile and bleed easily. Granulation tissue also contains proliferating fibroblasts that produce growth factors and new collagen fibers. These collagen fibers help to bridge the gaps and some of the fibroblasts pull the margins of the wound together. The granulation tissue will eventually become scar tissue which is highly resistant to infection.

The third stage occurs during the organization process. The surface epithelium begins to regenerate. This regeneration occurs beneath the scab. Eventually, the scab will detach. The fibrous tissue beneath will mature and contract until it looks like the surrounding skin. The result is a fully regenerated epithelium. The scar may be visible or invisible depending on the severity of the trauma to the tissue.

This repair process occurs when a wound like a cut, scrape or puncture breaches the epithelial barrier. Simple infections usually result in regeneration. Severe infections usually lead to scarring.

According to the author, what are the 3 steps of tissue repair?

How is regeneration different from fibrosis? Which is better for tissue repair?

The author does not cite their sources, using your textbook determine how accurate the author is. Does the author editorialize at all? Does the author remain consistent with Elaine Marieb and Katja Hoehn?