How do wounds, cuts, scrapes, lacerations heal? [1]

Alice,

I fell on my roller blades yesterday and skinned my knee. Now I'm watching my knee change and I am fascinated by the healing process. Could you explain to me just what is happening?

Thanks!

Answer

Dear Reader,

Fascinating is a good word for healing — before you finished picking yourself up and brushing the gravel out of your knee, your body had already begun a complex process that will soon have you ready to blade again (perhaps with knee pads this time?).

The moment you cut or tear a blood vessel, the body's Superheros of Healing spring into action. Here's how healing works:

- First comes **vasoconstriction** — blood vessels leading to the wound tighten to reduce the flow of blood to the injured area.
- Platelets (triggered by enzymes leaked from the torn blood vessel) rush to the scene. These sticky blood cells clump to each other and then adhere to the sides of the torn blood vessel, making a plug.
- Clotting proteins in the blood join forces to form a *fibrin net* that holds the platelet plug in place over the tear, and in just a few seconds or minutes (depending on how bad the scrape is), **BLEEDING STOPS**, thanks to coagulation! The fibrin plug becomes a scab that will eventually fall off or be reabsorbed into the body once healing is complete.

Once bleeding has been controlled, the next step is stopping infection:

- The blood vessels that were constricted now dilate to bring *white blood cells* rushing to the scene. White blood cells engulf and destroy any germs that may have gotten into the body through the open wound.

When the enemies of blood loss and infection have been vanquished, the body turns its attention to healing and rebuilding:

- **Fibroblasts** (cells that are capable of forming skin and other tissue) gather at the site of injury and begin to produce *collagen*, which will eventually fill in the wound under the scab and create new capillaries to bring oxygen-rich blood to the recovering wound.
- **Skin** along the edges of the wound becomes thicker and then gradually migrates (or stretches) under the scab to the center of the wound, where it meets skin from the other side and forms a scar (about three weeks after the initial injury).
- **Scar tissue** will become stronger and fade gradually over the next several years as more collagen is added, but will only have about 80 percent of the strength of the original skin.

Not all wounds heal equally. Generally speaking, more serious wounds take longer to heal. Individual factors also influence how quickly your body is able to recover from a wound, including:

- **Age** — young'uns usually heal faster than older folks
- **Nutrition** — the body needs a good supply of vitamin C to make collagen
- **Smoking** — non-smokers, on average, heal more quickly than smokers
- **Stress** — large amounts of stress can delay the healing process
- **Other infections or illnesses** — diabetes, thyroid disease, high blood pressure, and poor circulation, for example, can decrease the body's ability to heal

If you have wounds that are slow to heal, check with your health care provider. It could be a sign of an underlying illness. Best of luck staying on your feet next time,

Alice!
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