

Q

A

Why do injections hurt more on some parts of the skin than on others?

*Patience,
an undergraduate student*

The skin contains millions of nerves that respond to a myriad of sensations, including touch, temperature, and pain. The number of nerves that cover the skin varies from one part of the body to another. Areas that need to discriminate fine sensations have more nerves than areas that do not require this ability. Your hands and fingers, for example, have many more nerves than your back, because hands and fingers need to do more intricate tasks, such as writing or threading a needle. You feel more pain from injections to the more sensitive parts of your skin because there are more nerves reacting to the “insult.”

You can test how many nerves are in an area of skin by closing your eyes and having someone pretend to write on that area with a finger. Most people instantly know the letters drawn on their hand but have a harder time figuring out a message written on their back.

To minimize pain, injections are typically given in the shoulder, buttock, or thigh. These areas are like the back in that they have fewer nerve endings than other parts of the body but are convenient and safe to inject. Rolling up your sleeve to expose your shoulder is much easier than taking off your shirt to expose your back.

More importantly, needles stuck in these areas are less likely to injure internal structures. Unlike the back, the shoulder, buttock, and thigh are relatively distant from vital organs.

Attempts have been made to reduce the pain felt during injections. A commercially available option is a gel patch containing lidocaine, a fast-acting numbing medication. Applied to the skin, the patch numbs the nerves. This patch is sometimes used for especially anxious children to minimize or eliminate the pain from needles.

Researchers are also working on an experimental system called transdermal injection, which eliminates the need for needles. Just as *Star Trek's Enterprise* crew members received injections via “hyposprays,” transdermal injections force medications into the bloodstream by pushing them through the tiny pores of the skin. However, most drugs are too big to push through the skin, so researchers have more work to do. In the meantime, we will have to bear with the brief pain that occurs when we receive a medically necessary injection.

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