How gene therapy could eventually snip out diseases in the womb

In a future when gene therapy can tweak a person's genome precisely enough to cure them of severe disease, treating earlier will often be better—and the womb is as early as it gets.

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Doctors can already detect abnormalities in the DNA of a developing human fetus. Conditions like sickle cell anemia and spinal muscular atrophy arise with genetic signatures—sometimes as simple as a single gene mutation—that appear in prenatal screens. New gene therapies can treat adults and even kids with these conditions, but they have some drawbacks: They can cost millions of dollars for a one-time dose, and many are currently only available to clinical trial participants. Most of all, by the time a person receives them, they may have already spent months, if not many years, living with a serious illness.

Physicians and scientists hope that by correcting these abnormalities before birth, a newborn will stand a better chance of a healthy life. “The main advantage of administering these therapies in the womb or before birth would be to prevent disease before it happens,” says Bill Peranteau, a pediatric and fetal surgeon with the Children's Hospital of Philadelphia.

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