

Raising awareness of spina bifida

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Spina bifida is the most common birth defect of the central nervous system and the second most common of all structural birth defects. To learn more about it, Baylor College of Medicine's From the Labs sat with Dr. Richard H. Finnell, whose lab at Baylor College of Medicine focuses on discovering the role of folic acid in the prevention of birth defects

and in identifying the genes that determine susceptibility to human neural tube defects such as spina bifida.

What is spina bifida?

Spina bifida is a condition that occurs during very early development affecting the [neural tube](#), which will give rise to the spinal cord and brain. It can be diagnosed during pregnancy or after the baby is born. Typically, the neural tube closes by the 28th day after conception. In babies with spina bifida, a portion of the neural tube doesn't close properly, resulting in a malformed spinal cord and problems in the bones of the spine. The neural tube exposed to amniotic fluid results in bladder and bowel dysfunction and in orthopedic problems that limit the child's ability to walk. These associated symptoms severely limit the quality of life for the child with spina bifida.

What causes spina bifida?

The current thinking is that spina bifida arises from [complex interactions](#) between genomic and [environmental factors](#), including maternal diabetes, hyperthermia, anti-seizure medications, obesity and a number of different environmental and occupational exposures to toxins. No [single gene](#) or genes have been identified that cause isolated neural tube defects. We need more research into the causes of this life-long condition to improve its prevention and treatment.

Can spin bifida be prevented?

Folic acid supplementation is considered one of the most significant public health breakthroughs in recent years. By providing mandatory [folic acid](#) fortification, as 87 countries, including the U.S. since 1998, now do, we can prevent the vast majority of neural tube defect cases.

But in about 30% of the cases, folic acid is not protecting. Since prevention efforts fall short of our desire to prevent all preventable birth defects, we must consider novel approaches to managing pregnancies to reduce the number of affected infants.

Can spina bifida be treated?

Babies born with spina bifida can receive surgical interventions to repair the malformations. However, no two cases are alike and may require different approaches. Global accessibility to care is still lacking, and the neurosurgical community in [high-income countries](#) is partnering with neurosurgical centers elsewhere to provide in-person training, telecollaboration, and augmented reality tools for the use of modern endoscopic and surgical techniques. Because of the preventive, medical, and surgical successes of past decades, over half of the estimated 166,000 persons in the United States who are living with spina bifida are adults. At Baylor College of Medicine, we are actively engaged in developing novel treatments utilizing non-cellular products from amniotic fluid as well as stem cells during in utero surgical repairs to improve the outcome and reduce the challenges faced by children born with spina bifida.

How many babies are affected by spina bifida?

About 3,000 babies are born with [spina bifida](#) in the U.S. each year. However, in countries in which folic acid dietary fortification has not been mandated, about a hundred in the world, the number can be as 40 times as high. My lab is all about preventing [preventable diseases](#) by studying both pharmaceutical and environmental compounds, as well as genetic factors that contribute to the burden of birth defects.

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More information: Bermans J. Iskandar et al, Spina Bifida, *New England Journal of Medicine* (2022). [DOI: 10.1056/NEJMra2116032](https://doi.org/10.1056/NEJMra2116032)

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