

# Understanding Neural Tube Defects: Causes, Diagnosis, and Prevention



## Highlights

The neural tube forms early in pregnancy and develops into the brain and spinal cord.

Neural tube defects occur when the neural tube does not fully close.

Taking folic acid (vitamin B9) supplements before and during early pregnancy significantly reduces the risk of neural tube defects.

Ultrasounds and second-trimester maternal serum screening tests can help diagnose neural tube defects.

If diagnosed, a specialized medical team may offer further tests, counseling, and treatment options.

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### **What Is the Neural Tube?**

#### **Understanding Neural Tube Defects**

Anencephaly - A severe birth defect where major parts of the brain, skull, and scalp do not develop properly. Babies with anencephaly often do not survive long after birth.

Encephalocele - A condition where brain tissue or its membranes bulge through a skull defect.

Spina bifida - A condition where parts of the spine do not fully close, leading to potential nerve damage and physical disabilities of varying severity.

#### **Contributing Factors and Causes**

A lack of folic acid in the early stages of pregnancy

Certain medications, such as those used to treat epilepsy

Diabetes that is insulin-dependent

A family history of neural tube defects or a previous pregnancy affected by them

#### **Diagnosis and Testing**

Maternal Serum Screening Test - A blood test performed between weeks 14 and 20 of pregnancy to estimate the risk of neural tube defects. If results indicate a higher risk, further diagnostic tests may be recommended.

Ultrasound Screening - Conducted between weeks 18 and 20 to monitor fetal development and detect most cases of neural tube defects.

#### **When a Neural Tube Defect Is Diagnosed**

Physical disabilities - Difficulty with movement and coordination

Bladder and bowel challenges - Difficulty controlling bladder and bowel functions

Hearing and vision impairments

Intellectual disabilities

Differences in physical appearance

## **Prevention Strategies**

Green leafy vegetables

Certain fruits

Legumes (beans, peas, lentils)

Wholegrain breads

Fortified cereals

## **Recommended Folic Acid Intake**

Adults should consume at least 0.4 mg (400 mcg) daily.

Pregnant individuals and those planning pregnancy should take an additional 0.4 mg (400 mcg) supplement daily, starting at least one month before conception and continuing through the first trimester.

High-risk individuals (such as those with a history of neural tube defects) may require a higher dosage of 5 mg daily, as recommended by a healthcare provider.

## **Tools and Assistance**

Parenting and disability support groups: Peer support can offer a sense of community and shared experience.

Healthcare professionals: Your doctor, midwife, or a genetic counselor can offer expert guidance and answer any questions.

Nutritional counseling: Dietitians can provide tailored advice on folic acid intake and prenatal nutrition.

Prenatal education classes: These programs may include sessions on fetal development, screening options, and managing prenatal health.

Emotional support services: If you are coping with a diagnosis or concerned about risks, mental health professionals can help you navigate your feelings.