

## Amniocentesis <sup>[1]</sup>

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**Amniocentesis** <sup>[4]</sup> is a test used for **prenatal diagnosis** <sup>[5]</sup> of inherited diseases, *Rh* incompatibility, **neural tube** <sup>[6]</sup> defects, and lung maturity. Normally performed during the second **trimester** <sup>[7]</sup> of a **pregnancy** <sup>[8]</sup>, this invasive procedure allows the detection of health problems in the **fetus** <sup>[9]</sup> as early as fifteen weeks **gestation** <sup>[10]</sup>. Although amniocentesis does carry some significant risks, the medical community commonly accepts it as a safe and useful procedure.

Rudimentary forms of trans-abdominal amniocentesis may have been practiced as early as 1877, but the birth of the modern procedure was detailed in *Nature* in 1956 by **Fritz Fuchs** <sup>[11]</sup> and **Povl Riis** <sup>[12]</sup>. The technology was originally used to determine the sex of the **fetus** <sup>[9]</sup> but later advanced to allow the detection of **hemophilia** <sup>[13]</sup> in 1960 and muscular dystrophy in 1964. Since then the procedure has been improved and expanded to test for a wide variety of inherited diseases and chromosomal abnormalities.

During amniocentesis, a thin syringe is inserted through the abdomen and into the **uterus** <sup>[14]</sup> to extract fluid from the **amniotic sac** <sup>[15]</sup> that surrounds the **fetus** <sup>[9]</sup>. Two to four teaspoons, or approximately 1 cc of fluid per gestational week, are removed for testing. Ultrasound technology is often used to prevent injury to the **fetus** <sup>[9]</sup> or mother. The fetal cells are given a few days to multiply before a **karyotype** <sup>[16]</sup>, a picture of the chromosomes to identify chromosomal abnormalities, is performed and test results can be obtained. In cases where amniocentesis is used to determine the lung maturity of a **fetus** <sup>[9]</sup> the procedure is performed around or after thirty-six weeks **gestation** <sup>[10]</sup> to determine if early delivery is safe, and results are available within hours. **Amniocentesis** <sup>[4]</sup> performed before fifteen weeks **gestation** <sup>[10]</sup> is called early amniocentesis.

Although early amniocentesis still has high complication rates, both the lung maturity test and the standard amniocentesis procedure have a low likelihood of incurring risks, often as low as a 1% chance. Some possible negative side effects of performing the test include: induced **miscarriage** <sup>[17]</sup> from a ruptured **amniotic sac** <sup>[15]</sup>; bleeding or infection; heavy cramping; fetal injury; and *Rh* sensitization, or when an *Rh* negative mother develops antibodies to the fetus's blood due to *Rh* protein entering her bloodstream. Because of the potential risks, amniocentesis is only recommended for pregnant women over the age of thirty-five, women who have had previous pregnancies testing positive for chromosomal problems or **neural tube** <sup>[6]</sup> defects, and women who have harmful genetic diseases in their family history.

Women who undergo this procedure will be informed of any genetic or chromosomal problems the [fetus](#) [9] may have, and in the case of a positive diagnosis, they can use the provided information to either prepare for a child with such a disorder or seek an [abortion](#) [18]. While amniocentesis can detect certain diseases, it is often unable to ascertain the severity of the disorders, making the woman's decision more difficult. In addition, the results of amniocentesis can come considerably later in a [pregnancy](#) [8] than earlier diagnostic tests, such as chorionic villus sampling (CVS), which can also complicate a woman's decision.

[Amniocentesis](#) [4] is a safe, commonplace procedure for [prenatal diagnosis](#) [5] of genetic and chromosomal disorders. The technology has advanced significantly since its inception, and with its increased use and availability, the technique is likely to improve further still.