



The
Fertility Society
of Australia

Parenting from before conception

New research shows that the health and lifestyle of both mothers and fathers before and around the time of conception affect the health of the baby at birth and into adulthood. Here is how it works and how you can give your baby the best start in life.



Your Fertility is a national public education program funded by the Australian Government Department of Health and the Victorian Government Department of Health and Human Services.

Conception explained

A baby is conceived when an egg (oocyte) is fertilised by a sperm. Sperm are produced and stored in a man's testes. Through a maturation process which takes about two months, primitive germ cells become mature sperm. Women are born with all the eggs they will ever have and they are stored in the ovaries. At the start of a menstrual period a number of eggs begin to mature. At ovulation one of these eggs is released into the Fallopian tube. If there is sperm present in the Fallopian tube at that time, the egg can be fertilised. The fertilised egg divides and becomes an embryo, which after a few days, attaches and grows in the lining of the uterus. Through the placenta, the fetus receives nutrients and oxygen from the mother which allows it to grow and develop.

Genes make us who we are

Mature eggs and sperm have 23 chromosomes each and when they come together a new individual with 46 chromosomes is formed. The chromosomes contain genes which determine the characteristics of the new individual such as eye colour, height, blood group etc. Genes are made up of DNA which is the basic building block of life and determines the development and functioning of all living entities. Most of the 20,000 to 25,000 genes we have are located in the chromosomes. There are also some genes in the mitochondria which are structures within cells that provide energy to the cell.

Genes and the environment

Genes are sensitive to the environment and can change how they function if they are exposed to sub-optimal conditions. Changes in genes in response to the environment are called epigenetic effects. Epigenetic changes can affect the health of the baby at birth and in adulthood.

It has long been known that epigenetic changes occur in fetal life in response to the environment in the uterus. For example, if a pregnant woman smokes or is under-nourished, this increases the risk of the baby being smaller than expected at birth (small for gestational age). This in turn increases the risk of poorer health in adulthood.

There is now growing evidence that conditions before and at the time of conception also affect the short and long-term health of offspring. This includes the environment where eggs and sperm mature and the composition of the fluid in the Fallopian tube when fertilisation takes place.

How parents' health affects the health of their children

In addition to the genetic material parents contribute to their offspring, their condition at the time of egg and sperm maturation and conception have lasting effects on the expression of the genes and the health of the future child.

The mother's diet at the time of conception has a major impact on the developing embryo. Reduced protein content, for example, can slow cell proliferation and affect the development of the placenta negatively. If the mother has an infection or a non-infectious inflammation in her body at the time of conception, this can change the future child's immune defence.

Older parental age, obesity and smoking before and at the time of conception are other major influences on epigenetic changes which adversely affect the health of the baby at birth and in adulthood.

Optimising health before conception

Parenting is a life-long responsibility and all parents want the best for their children. Research shows that parents can improve the odds of their children having good health by optimising their own health before conception and during pregnancy.

If you plan to have children see your doctor for a comprehensive pre-conception health check and strive to:

- be in the healthy weight range
- if you smoke, quit
- eat a healthy nutritious diet and exercise regularly
- take folate supplement (women only)
- limit alcohol intake
- avoid contact with toxic chemicals in the work and home environments
- see a doctor if you suspect an infection or other inflammation.

Based on the content of Lane, M., R.L. Robker, and S.A. Robertson, Parenting from before conception. *Science*, 2014. 345(6198): p. 756-760.

For more information about pre-conception health visit



www.yourfertility.org.au