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Consequences of Endocrine Disruptors

A good example of the devastating consequences of exposure to endocrine disruptors is the use of diethylstilbestrol (DES). For almost 30 years, this synthetic estrogen was prescribed to as many as 5 million women to help prevent spontaneous abortion and promote fetal growth. A clinical report published in 1971 associated DES with vaginal adenocarcinoma. This rare form of reproductive tract cancer was detected in a small number of adolescent daughters of women who had taken the drug while pregnant. A later discovery showed an adverse effect on the reproductive systems of the DES-exposed daughters and was the determinant cause of vaginal cancer. An estimated 95% of these DES-exposed daughters experienced frequent genitourinary tract problems including:

- Reproductive dysfunction
- Abnormal pregnancies
- Reduced fertility
- Immune system disorders

Similarly, male offspring with prenatal DES exposure experienced:

- Hypospadias, a birth defect in boys in which the opening of the urethra is not located at the tip of the penis.
- Microphallus *(*micropenis*)*, defined as a stretched penile length of less than 2.5 standard deviations *(SDs)* below the mean for age.
- Retained testes *(undescended testicle),* or a testicle that hasn't moved into its proper position in the scrotum before birth.
- Decreased fertility

It was also shown that DES could pass through the placenta and have direct effects on a developing fetus. This medical catastrophe became the first example of an in-utero toxicant in humans. Multiple studies have reported decline in both the quality and quantity of sperm production showing the generational effects a chemical hormone disruptor can have. Historically speaking, DES is thought to be the first endocrine-disrupting chemical but in truth, it is likely just the first known.

Thankfully, DES is no longer used in pregnant women, but it is still a therapeutic option for other medical conditions. As far as the children of DES-exposed women are concerned, females face a significantly higher risk for certain cancers and infertility. We are still dealing with the ramifications of exposure that occurred more than 50 years ago. More recently, second-generation effects have been reported putting yet *another* generation at risk for developing further serious health consequences as the result of their grandmothers' exposure to a single toxic endocrine disrupter.