

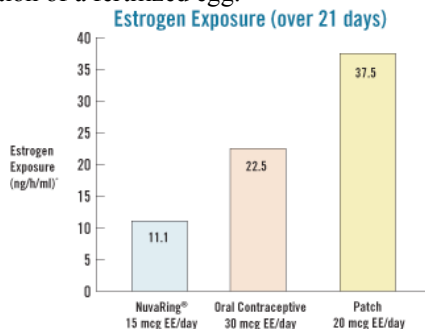
## NuvaRing®

Chelsae Meier-Biomedical Engineering-University of Rhode Island

The NuvaRing, a plastic, flexible, transparent contraceptive vaginal ring, is considered to be a “combined contraceptive” for its unique combinational use of two different hormones. It is often preferred over other forms of contraceptives due to this exceptionality as well as the fact that the Ring (as it is often referred as) releases such a low level of hormones.

Manufactured by Organon, the NuvaRing was first approved in the Netherlands in early 2001 and made its way to the United States, getting FDA approved on October 3, 2001. It was not until July 2002, however, that the NuvaRing was on the shelves in the U.S. The NuvaRing has now become a very popular form of contraceptive and is used by approximately 1.5 million women worldwide.

The primary use of the NuvaRing is to inhibit the natural process of ovulation. This is easily accomplished by emitting low levels of estrogen to “trick” the female body into thinking it is pregnant. The low hormone doses prove to show less side effects than those of other contraceptives. It also has fewer hormonal ups and downs as “the Pill” does, for example. There is a consistent, efficient release the entire time the Ring is inside the walls of the vagina. The Ring uses 120µg of etonogestrel (a progestin) and 15µg ethinyl estradiol (an estrogen) throughout each day of use. This suppresses ovulation, thickens the cervical mucus which inhibits the entry of sperm through the vaginal entryway, and thins the lining of the endometrial walls, thereby impeding on the implantation of a fertilized egg.



The NuvaRing is manually inserted by the user and will remain there for three consecutive weeks, following a woman’s 28 day cycle. The fourth week is considered to be the “ring-free” or “break week” in which the person will begin to naturally menstruate. A new ring must be inserted every month to ensure the best contraceptive efficiency. Once inserted the ring remains inside the vaginal walls unless manually removed. The inner muscles of the vaginal walls keep the NuvaRing securely in place during any form of activities and forms to any woman’s body. There are some cases however that the Ring may be accidentally expelled. If the Ring is left outside of the body for less than three hours the contraceptive effectiveness does not worsen.



Upon insertion of the NuvaRing, the hormone release begins when the Ring comes into contact with the vagina. The walls of the vagina absorb the hormones and carry them throughout the body via the bloodstream. In the female body Follicle Stimulating Hormones (FSH) and Lutenizing Hormones (LH) are what stimulate the ovary to produce an egg for fertilization. With a normal menstrual cycle, hormones stimulate the ovary in order to “ripen” the egg. When this happens the uterine lining thickens to prepare for the implantation of an egg and the cervical mucus thins in order to create an easier passageway for the sperm to reach the egg. The body’s normal estrogen amounts will cause the pituitary gland to release LH used to produce the “ripe” egg. With the use of the NuvaRing, estrogen levels are lower which “fools” the body to think it is already pregnant. This prevents the pituitary gland to release LH. This in turn suppresses the ovulation process. The progesterone in the Ring thickens the cervical mucus, creating a natural barrier to stop any sperm from entering into the uterus. Because the uterine walls do not thicken as in a regular cycle, this also impedes the egg from attaching to the endometrium.

Failure rates within the first year of use is between 1-2% giving the effective rate of the NuvaRing 99%. Only 15.1% of users discontinued the use of the Ring due to adverse events of foreign body sensations, coital problem, or expulsion. Most common adverse events reported by 5 of 14% of the 2501 women who used the NuvaRing in the five clinical trials were: vaginitis, headaches, upper respiratory tract infection, leucorrhea, sinusitis, nausea, and weight gain. The Ring does NOT prevent any form of STD’s. There are however many benefits to this product. Most women using the ring have more regular, lighter, shorter periods and reversibility of the Ring takes only 0-4 weeks upon removal giving the user the ability to become pregnant soon after the Ring is removed. It has been assumed that the Ring is more effective than the pill since 8 out of every 100 pill users become pregnant and fewer than one woman out of every 100 women who use the Ring become pregnant. The ring costs between \$30-\$35 a month and will ensure great efficiency in the product.

### References:

[http://www.nuvaring.com/Consumer/new/aboutNuvaRing/index\\_flash.asp](http://www.nuvaring.com/Consumer/new/aboutNuvaRing/index_flash.asp)  
<http://www.plannedparenthood.org/birth-control-pregnancy/birth-control...>  
<http://en.wikipedia.org/wiki/NuvaRing>