ENDOMETRIAL RECEPTIVITY

Implantation Window

Period when the womb is receptive for implantation of the free-lying blastocyst.

♀ Female

About Endometrial receptivity

A receptive endometrium and viable blastocyst are the two necessary conditions of successful implantation. The endometrium is receptive only during the window of implantation, which lasts approximately four days (day 20–23), and occurs in humans during the mid-secretory phase in a normal 28-day menstrual cycle. With some disparity between sources, it has been stated to occur from 7 days after ovulation until 9 days after ovulation, or days 6-10 postovulation. On average, it occurs during the 20th to the 23rd day after the last menstrual period. During the window of implantation, the endometrium undergoes extensive morphological and physiological changes to facilitate implantation of the embryo, including becoming more vascular and edematous with the glands displaying enhanced secretory activity. This process is precisely regulated. Among all the regulating elements, reproductive hormones are the leading factors. These changes are collectively known as the plasma membrane transformation and bring the blastocyst nearer to the endometrium and immobilize it. During this stage the blastocyst can still be eliminated by being flushed out of the uterus. Scientists have hypothesized that the hormones cause a swelling that fills the flattened out uterine cavity just prior to this stage, which may also help press the blastocyst against the endometrium. The implantation window may also be initiated by other preparations in the endometrium of the uterus, both structurally and in the composition of its secretions.

Effect of hormones on endometrial receptivity

After ovulation, under the influence of progesterone, the endometrium changes to a secretory lining in preparation for the potential implantation of an embryo to establish a pregnancy. Elevated progesterone levels might induce premature endometrial maturation and, as a consequence, earlier opening of the implantation window that leads to asynchronization of the crosstalk between embryo and endometrium. Throughout the entire follicular phase, rising estrogen levels in the blood stimulates growth of the endometrium and myometrium of the uterus. It also causes endometrial cells to produce receptors for progesterone, which helps prime the endometrium to the late proliferative phase and the luteal phase.

IVF and Endometrial receptivity

In patients undergoing in vitro fertilization (IVF) procedures one major set of hurdles, which often prevents healthy embryos from resulting in pregnancies, are problems associated with endometrial receptivity. As a result if the embryo fails to adhere, due to some luteal phase defect or other, undefined “implantation window” problem, there is a significant risk that the embryo might be washed out of the cervix or become lodged in the fallopian tubes. In part, to compensate for this potential conceptus loss, physicians have adopted the practice of transferring higher numbers of embryos back to the uterus.

Find more about related issues

Diagnoses
Adenomyosis
Medical condition characterized by the presence of ectopic endometrial tissue within the myometrium.
Learn more at: www.fertilitypedia.org/therapy/diag/adenomyosis

Amenorrhea
The absence of a menstrual period in women of reproductive age.
Learn more at: www.fertilitypedia.org/therapy/diag/amenorrhea

Anorexia Nervosa
An eating disorder characterized by the maintenance of a body weight below average, fear of gaining weight, and a distorted body image.
Learn more at: www.fertilitypedia.org/therapy/diag/anorexia-nervosa

Autoimmune disorders
A condition arising from an abnormal immune response to a normal body part.
Learn more at: www.fertilitypedia.org/therapy/diag/autoimmune-disorders-1

Lupus erythematosus
Collection of autoimmune diseases in which the human immune system becomes hyperactive and attacks normal, healthy tissues.
Learn more at: www.fertilitypedia.org/therapy/diag/lupus-erythematosus

Menopause
The time in most women’s lives when menstrual periods stop permanently, and the woman is no longer able to have children.
Learn more at: www.fertilitypedia.org/therapy/diag/menopause

Menstrual cycle disorders
An abnormal condition in a woman’s menstrual cycle.
Learn more at: www.fertilitypedia.org/therapy/diag/menstrual-cycle-disorders

Repeated implantation failure
The absence of implantation after three or more transfers of high quality embryos or after placement of 10 or more embryos in multiple transfers.
Learn more at: www.fertilitypedia.org/therapy/diag/repeated-implantation-failure

Thyroid disorders
A medical condition impairing the function of the thyroid.
Learn more at: www.fertilitypedia.org/therapy/diag/thyroid-disorders

Sources

"Implantation (human embryo) [https://en.wikipedia.org/wiki/Implantation_%28human_embryo%29]" —sourced from Wikipedia licensed under CC BY-SA 3.0


"Endometrial Receptivity Profile in Patients with Premature Progesterone Elevation on the Day of hCG Administration [http://www.HINDAWI.COM/JOURNALS/BMRI/2014/951937/]" —by Hàouzzi et al. licensed under CC BY 3.0

"SubEndometrial Embryo Delivery (SEED) with Egg Donation – Mechanical Embryo Implantation [http://cdn.intechopen.com/pdfs-wm/41093.pdf]" —by Kamrava and Yin licensed under CC BY 3.0

"S100P Expression in response to sex steroids during the implantation window in human endometrium [http://rbej.biomedcentral.com/articles/10.1186/1477-7827-10-106]" —by Zhang et al. licensed under CC BY 2.0