

CHAPTER 16

WINDOW OF IMPLANTATION (WOI)

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What is WOI?

The window of implantation (WOI) is accepted as that period when the endometrium is receptive for implantation of the embryo. This period is maintained by the action of estrogen and progesterone on the endometrial zone. WOI begins with apposition continues through attachment and invasion of the blastocyst to endometrium. The optimal time for WOI lies between postovulatory days +3 to +5, where luteal day +1 is the first day of exogenous progesterone treatment (1,2).

How can we detect WOI in women on natural cycles or undergoing ET?

Exact time of WOI is not clear and wide range of individual differences is possible. WOI is a specific time of the implantation process and begins 4–5 days after endogenous or exogenous progesterone exposure and ends up 9–10 days later (1,2). Conventionally, WOI is considered as occurring 8 to 10 days following ovulation and ends up within 2 or 3 days (3). WOI can also be defined between days 19 and 23 of the menstrual cycle (1,2).

Why is WOI important in ART cycles?

In order to increase clinical pregnancy rates in IVF/ICSI cycles many studies have focused predominantly on the understanding genetic and molecular basis of endometrium receptivity and optimization of embryo transfer time. The endometrium is accepted receptive for blastocyst during an individually defined period in which implantation zone allows attachment and invasion of embryo. Alteration in the individual receptivity status of many infertile women have been reported (4). Therefore, in order to improve implantation chance of each transferred embryo personalized diagnostic approach is required. This approach should be determined WOI time precisely and reliable manner. The endometrial receptivity array (ERA) is the only method of testing currently in use for this purpose (5). WOI time can be detected more accurately by using the ERA test.

	ERA test ¹⁻⁴	Ideal test?
Method	Microarray/transcriptomic	Proteomic
Samples	Endometrium biopsy	Blood
Timing biopsy	<ul style="list-style-type: none"> • Seven days after the LH surge in a natural cycle, • At the end of 5 days of progesterone administration after estrogen priming. 	Whenever you want
Measured product	Genes	Genes, protein, and other markers
Why 238 genes	The number of 238 genes analyzed by ERA were chosen according to the results of 14 previous manuscripts searching for the transcriptomic analysis of endometrial receptivity.	Whole genome and receptivity marker analysis
Histology of endometrium	Independent of histology	Independent of histology
Classification of endometrium	Receptive, Pre-receptive, Post-receptive	Receptive or unreceptive
Reproducibility	40 months	During reproductive period

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