



BLASTOCYST EMBRYO TRANSFER FACT SHEET

Background

After conception in natural cycles, the embryo travels along the fallopian tube while it develops. The embryo enters the uterine cavity (endometrium) about 3-4 days after ovulation. There are proteins on the surface of the zona that interact with the endometrium to make it adhere to the endometrial surface. While sitting on the endometrium, the embryo develops into a "blastocyst". A blastocyst is a 5-6 day old embryo which contains many cells surrounding a cystic cavity, and an "inner cell mass" that is destined to develop into the baby. Up till 5 days, the embryo is still enclosed within the zona pellucida. By day 5 or 6, the blastocyst begins to break down the zona and by day 6 or 7, the blastocyst has completely "hatched" from the zona. The growing embryo can now implant into the endometrium.

In IVF, the embryo develops in the laboratory rather than the fallopian tube. Transfer to the uterus on Day 3 after retrieval allows the embryologist to evaluate the growth of the embryos and decide on which are most likely to continue development once in the uterus. It also simulates the "natural" cycle by introducing the embryo into the uterine cavity at about the same time it would normally arrive there. Transferring embryos at the blastocyst stage (Day 5-6 after transfer) arose out of a desire to have an even better understanding of which embryos are most likely to implant and grow normally. Allowing the embryos to develop longer in the laboratory may help us to select the most viable embryos. Indeed, the implantation rate of blastocysts is higher than that of Day 2-3 embryos so that by transferring fewer blastocysts, we maintain the same pregnancy rate as transferring 3 or 4 embryos on Day 2-3 but decrease the incidence of high-order multiple births (triplets or more).

Risks and Complications:

There are drawbacks to blastocyst transfer. Not all embryos will progress to the blastocyst stage. Sometimes none of a patient's embryos become blastocysts (about 5-10% risk). This may be a consequence of poor quality embryos that wouldn't have implanted anyway or it may be that development is limited by laboratory culture conditions. Approximately 40% of embryos successfully develop into blastocysts. If the starting number of embryos is low (fewer than 6 embryos) or if none of the embryos advance to the 8-cell stage by Day 3 after retrieval, then we face a higher chance that none of the embryos will remain viable by Day 5-6. To avoid the possibility of no embryos for transfer on Day 5, NCRS recommends embryo transfer on Day 3 rather than attempting blastocyst transfer when fewer than 6 high quality 8 cell embryos are available.

We cannot guarantee improved pregnancy rates or even that any pregnancy will result from using blastocyst embryo transfer. IVF and embryo culture fails to produce any blastocysts in as many as 10% of cycles. We will try to determine who should transfer on Day 3 rather than proceed to blastocyst stage but no criteria can prevent some patients from having no viable embryos for transfer on Day 5. No one knows whether embryos that die in laboratory culture would have developed into normal pregnancies if they had been transferred into the uterus at an earlier stage. We cannot assure you that pregnancies resulting from blastocyst transfer will be normal in course or outcome. Miscarriage, ectopic pregnancy and other prenatal problems occur at the same rate as with conventional IVF.

The risk of identical twins after blastocyst transfer seems to be slightly higher than found in nature. Identical twin pregnancies are more complicated than fraternal twins with much higher rates of pregnancy failure and loss of one or both babies. Other reports suggest a slightly higher probability of male children after blastocyst transfer.

Blastocyst culture often produces fewer total embryos than Day 2-3 embryo culture so fewer cycles yield excess embryos for cryopreservation. As with Day 2-3 embryos, excess frozen blastocysts may not survive the freeze-thaw process.