Criteria for Selecting Which Embryo to Transfer

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Multiple pregnancies are the most common adverse outcome of assisted reproduction technologies (ART) and the dangers associated with those pregnancies have been reduced by elective single embryo transfers (eSET). Therefore, it is especially important in transferring a single embryo, to improve the selection process in order to define the quality of the embryos that are most likely to implant.

Labs typically use 2 or 3 criteria to determine which embryo is best and should be transferred first. Analysis of embryo morphology remains the most relevant criterion for choosing the embryo to transfer. In addition to morphological grading (an embryologist's interpretation of how specific regions of the embryo appear), these may also include: how fast the embryo is dividing (i.e., how quickly an embryo reaches a specific stage of development like blastocyst or cleavage stage) and, Preimplantation Genetic Testing (PGT) — whether an outside laboratory believes the embryo has the appropriate number of chromosomes.

Time-lapse imaging provides criteria predictive of implantation potential. In this context, extended culture until blastocyst stage is a valuable tool. Pre-implantation genetic testing for aneuploidy (PGT-A) is also valuable in identifying the most competent embryo for transfer, thus improving reproductive outcomes.

Alternatively, another solution involves using comparative genomic hybridization (CGH) and moving to blastocyst biopsy. Finally, morphology will also be significantly helped by non-invasive analysis of biomarkers in the culture media that give a better reflection of whole-embryo physiology and function.

Most experts believe that the speed at which an embryo reaches any given stage (like the blastocyst stage) correlates with its odds of success. Embryos that reach the blastocyst stage in 5 days were more likely to lead to a birth. However, embryos that reach blastocyst in 6 days clearly have the potential to lead to births. Transferring cleavage stage embryos is no different, the earlier the embryo reaches that stage, the more likely that it will lead to a birth.

The goal of this presentation is to explain the techniques and technology that lab directors and reproductive endocrinologists employ to make important decisions on which eggs to transfer.