**Purpose:** To provide a consistent process for identifying candidates and the criteria for single embryo transfer (SET) in conjunction with an In Vitro Fertilization (IVF) Cycle.

**Goal:** To assist staff in promoting SET in order to minimize multiple gestations (twin and higher order) and the associated maternal and/or neonatal morbidity.

### Detailed Steps/Screen Shots

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<th>TOPIC</th>
<th>NOTES</th>
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| 1. Background Information | • Assisted reproductive technology (ART) poses a major risk of multiple pregnancy and birth that is associated with adverse maternal and infant outcome. The principal reason behind the large number of multiple pregnancies after IVF is the policy of transferring more than one embryo within the uterus in order to maximize pregnancy rates.  
  – Twin pregnancies and higher order gestations are associated with an increased risk of  
    • Preeclampsia  
    • Hypertension  
    • Preterm labor  
    • Preterm rupture of membranes  
    • Low birth weight (<2,500 g)  
    • Fetal death  
    • Cerebral palsy  
  – SET reduces the twin rate from 32.9% to 7.2% for patients <35 and from 27.4% to 4.0% for patients 35 to < 38 years of age  
• Pregnancy rates for SET are comparable to multiple embryo transfer  
  – Pregnancy rates are similar for autologous SET versus double-blastocyst transfer (65%-76% vs. 63%-79%)  
  • Multiple gestation rate is significantly higher for double blastocyst transfer (50% - 60%) vs. SET (3%)  
  • European data demonstrates a reduction of the multiple gestation rate to ≤1% in some studies  
  – Some studies suggest a lower initial pregnancy rate for SET compared to two embryo transfer, but cumulative pregnancy rates are similar (54.7% for SET vs. 49% for a double transfer)  
    • Requires subsequent frozen embryo transfer cycle if initial fresh cycle is unsuccessful  
    • Other studies demonstrate equivalent initial pregnancy rates between SET and double embryo transfer.  
  – Blastocyst transfer is more effective than a Day 3 transfer  
    • 33.1% vs. 21.6% in one study  
• Implantation rates for blastocyst SET are high (63%-75%) |
### Client/Target Population

- This guideline applies to all women ≤38 years of age with a favorable prognosis. It also applies to all women, regardless of age, undergoing ovum donation cycles where the oocyte donor is <35.
  - A favorable prognosis, independent of age, may be defined as
    - First cycle of IVF or prior IVF pregnancy
    - Good-quality embryos as judged by morphologic criteria (see below)
  - Excess embryos of sufficient quality to warrant cryopreservation

### Clinical Management

#### Diagnosis

- Candidates for SET,
  - Patients ≤38 with a favorable prognosis and all patients undergoing ovum donation cycles where the donor is <35
  - One or more morphologically high-quality blastocysts expanded day 5 or 6 blastocysts with well-defined inner cell mass and trophectoderm
  - Embryo(s) available for cryopreservation
- Normal uterine cavity

#### Medical Treatment and Surgery

- Pre-transfer counseling
- Education should be provided concerning the statistics of implantation, pregnancy (including cumulative pregnancy rates), and multiple pregnancy in favorable prognosis patients as well as the risks associated with multiple pregnancy, including twin gestation

#### Best Practices and Medical Director Escalation

- Staff education about the statistics of implantation, pregnancy, and multiple pregnancy in good-prognosis patients as well as the risks associated with multiple pregnancy, including twin gestation, should be made available
- Encourage blastocyst transfer vs. Day 3 transfer for improved selection of embryo to transfer and improved implantation rates
- Most (but not all) embryos failing to reach blastocyst stage of development are genetically abnormal

#### Case Example

A 33 year old member and her 34 year old husband undergo an IVF cycle for tubal factor infertility. Her stimulation proceeds well with the recovery of 15 oocytes. Standard fertilization results in 12 embryos. On the third day in culture there are 8 embryos at the 7-9 cell stage. The culture period is extended and on day 5 there are 3 well expanded blastocysts with an identifiable inner cell mass. The couple has limited financial resources and would prefer not to undergo another IVF cycle. Furthermore, the idea of an instant family of twins seems wonderful. The couple would like to know if it is reasonable to transfer all 3 embryos to assure success.

This couple needs to be educated about the significant risk for a multiple gestation if all 3 blastocysts were to be transferred. Furthermore, maternal, fetal and long-term consequences of any multiple gestation and the attendant high risk of prematurity should be discussed. This couple has an extremely favorable prognosis. The transfer of blastocyst embryos will most likely result in an implantation rate of >75%, resulting in the very real possibility of not only a twin, but a triplet gestation if all 3 embryos were to be transferred. Transferring 2 blastocyst embryos will not improve the chance for conception but will increase the risk for twins. This member is an ideal candidate for an elective single embryo transfer. The remaining 2 good quality blastocysts may be cryopreserved for future use. After further explaining that a frozen embryo transfer cycle is less involved and less expensive than a fresh IVF cycle and that the pregnancy outcome would be excellent, the couple agrees to an eSET.
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