Guidelines on number of embryos transferred

The Practice Committee of the American Society for Reproductive Medicine and the Practice Committee of the Society for Assisted Reproductive Technology

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Based on American Society for Reproductive Medicine (ASRM) and Society for Assisted Reproductive Technology (SART) data available in 2007, ASRM’s guidelines for the number of embryos to be transferred in in vitro fertilization cycles have been further refined in continuing efforts to reduce the number of higher-order multiple pregnancies. This version replaces the document of the same name that was published most recently in November 2008. (Fertil Steril® 2009;92:1518–9. ©2009 by American Society for Reproductive Medicine.)

Based on American Society for Reproductive Medicine (ASRM) and Society for Assisted Reproductive Technology (SART) data available in 2007, ASRM’s guidelines for the number of embryos to be transferred in in vitro fertilization cycles were revised in an effort to reduce the number of higher-order multiple pregnancies.

High-order multiple pregnancy (three or more implanted embryos) is an undesirable consequence (outcome) of assisted reproductive technologies (ART) (1). Multiple gestations lead to an increased risk of complications in both the fetuses and the mothers (2).

Although multifetal pregnancy reduction can be performed to reduce fetal number, the procedure may result in the loss of all fetuses, does not completely eliminate the risks associated with multiple pregnancy, and may have adverse psychological consequences (3). Moreover, multifetal pregnancy reduction is not an acceptable option for many women.

In an effort to reduce the incidence of high-order multiple gestations, ASRM and SART have developed the following guidelines to assist ART programs and patients in determining the appropriate number of cleavage-stage (usually 2 or 3 days after fertilization) embryos or blastocysts (usually 5 or 6 days after fertilization) to transfer. Strict limitations on the number of embryos transferred, as required by law in some countries, do not allow treatment plans to be individualized after careful consideration of each patient’s own unique circumstances. Accordingly, these guidelines may be modified according to individual clinical conditions, including patient age, embryo quality, the opportunity for cryopreservation, and as clinical experience with newer techniques accumulates.

I. Individual programs are encouraged to generate and use their own data regarding patient characteristics and the number of embryos to be transferred. Accordingly, programs should monitor their results continually and adjust the number of embryos transferred to minimize undesirable outcomes. Programs that have a high-order multiple pregnancy rate that is >2 standard deviations above the mean rate for all SART reporting clinics for 2 consecutive years may be audited by SART.

II. Independent of age, the following characteristics have been associated with a more favorable prognosis: 1) first cycle of IVF; 2) good-quality embryos as judged by morphologic criteria; and 3) excess embryos of sufficient quality to warrant cryopreservation. Patients who have had previous success with IVF also should be regarded as being in a more favorable prognostic category. The number of embryos transferred should be agreed upon by the physician and the treated patient(s), informed consent documents completed, and the information recorded in the clinical record. In the absence of data generated by the individual program, and based on data generated by all clinics providing ART services, the following guidelines are recommended (Table 1):

A. For patients under the age of 35 who have a more favorable prognosis: 1) one embryo (cleavage stage or blastocyst) should be transferred.

B. For patients 36–37 years of age who have a more favorable prognosis, no more than two cleavage-stage embryos should be transferred. If extended culture is performed, no more than two blastocysts should be transferred.

C. For patients between 38 and 40 years of age who have a more favorable prognosis, no more than three cleavage-stage embryos should be transferred. All others in this age group should have no more than three cleavage-stage embryos transferred. If extended culture is performed, no more than two blastocysts should be transferred to women in this age group.

D. For patients 41–42 years of age who have a more favorable prognosis, no more than three cleavage-stage embryos or two blastocysts should be transferred. All others in this age group should have no more than four cleavage-stage embryos or three blastocysts transferred.

E. For patients 43–44 years of age who have a more favorable prognosis, no more than four cleavage-stage embryos or two blastocysts should be transferred. All others in this age group should have no more than five cleavage-stage embryos or three blastocysts transferred.

F. For patients 45 years of age or older who have a more favorable prognosis, no more than five cleavage-stage embryos or three blastocysts should be transferred.

G. For patients 45 years of age or older who have a less favorable prognosis, one additional embryo should be transferred.

H. For patients 45 years of age or older who have a less favorable prognosis, two additional embryos should be transferred.

I. For patients 45 years of age or older who have a less favorable prognosis, three additional embryos should be transferred.

J. For patients 45 years of age or older who have a less favorable prognosis, four additional embryos should be transferred.

K. For patients 45 years of age or older who have a less favorable prognosis, five additional embryos should be transferred.

L. For patients 45 years of age or older who have a less favorable prognosis, six additional embryos should be transferred.

M. For patients 45 years of age or older who have a less favorable prognosis, seven additional embryos should be transferred.

N. For patients 45 years of age or older who have a less favorable prognosis, eight additional embryos should be transferred.

O. For patients 45 years of age or older who have a less favorable prognosis, nine additional embryos should be transferred.

P. For patients 45 years of age or older who have a less favorable prognosis, ten additional embryos should be transferred.

Q. For patients 45 years of age or older who have a less favorable prognosis, eleven additional embryos should be transferred.

R. For patients 45 years of age or older who have a less favorable prognosis, twelve additional embryos should be transferred.

S. For patients 45 years of age or older who have a less favorable prognosis, thirteen additional embryos should be transferred.

T. For patients 45 years of age or older who have a less favorable prognosis, fourteen additional embryos should be transferred.

U. For patients 45 years of age or older who have a less favorable prognosis, fifteen additional embryos should be transferred.

V. For patients 45 years of age or older who have a less favorable prognosis, sixteen additional embryos should be transferred.

W. For patients 45 years of age or older who have a less favorable prognosis, seventeen additional embryos should be transferred.

X. For patients 45 years of age or older who have a less favorable prognosis, eighteen additional embryos should be transferred.

Y. For patients 45 years of age or older who have a less favorable prognosis, nineteen additional embryos should be transferred.

Z. For patients 45 years of age or older who have a less favorable prognosis, twenty additional embryos should be transferred.

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No reprints will be available.
**TABLE 1**

<table>
<thead>
<tr>
<th>Prognosis</th>
<th>&lt;35 yrs</th>
<th>35–37 yrs</th>
<th>38–40 yrs</th>
<th>41–42 yrs</th>
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<tr>
<td>Cleavage-stage embryos&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1–2</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Favorable&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Blastocysts&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Favorable&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>All others</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

<sup>a</sup>See text for more complete explanations. Justification for transferring one additional embryo more than the recommended limit should be clearly documented in the patient’s medical record.

<sup>b</sup>Favorable = first cycle of IVF, good embryo quality, excess embryos available for cryopreservation, or previous successful IVF cycle.

Practice Committee Number of Embryos Transferred. Fertil Steril 2009.

may be transferred according to individual circumstances. The patient must be counseled regarding the risks of multifetal pregnancy. Both the counseling and the justification for exceeding the recommended limits must be documented in the patient’s permanent medical record.

F. In women ≥43 years of age, there are insufficient data to recommend a limit on the number of embryos to transfer.

G. In donor egg cycles, the age of the donor should be used to determine the appropriate number of embryos to transfer.

H. In frozen embryo transfer cycles, the number of good-quality thawed embryos transferred should not exceed the recommended limit on the number of fresh embryos transferred for each age group.

III. Because not all oocytes may fertilize when gamete intrafallopian transfer is performed, one more oocyte than embryo may be transferred for each prognostic category (5).

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**REFERENCES**


