

ASRM standard embryo transfer protocol template: a committee opinion

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Standardization improves performance and safety. A template for standardizing the embryo transfer procedure is presented here with 12 basic steps supported by published scientific literature and a survey of common practice of SART programs; it can be used by ART practices to model their own standard protocol. (Fertil Steril® 2017;107:897–900. ©2017 by American Society for Reproductive Medicine.)

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The 2014 to 2019 American Society for Reproductive Medicine (ASRM) Strategic Plan is focused on seven goals. Two of those goals are: 1) setting new standards in the continuing medical education of, and, 2) having maximal impact on reproductive medicine. In response to accumulating evidence that suggested a gap in clinician training and standardization of the embryo transfer procedure, ASRM presents the results of an embryo transfer initiative in this issue of *Fertility and Sterility*. Prior reports have suggested that the majority of fellows in reproductive endocrinology and infertility training perform very few, if any, embryo transfers. In addition, studies have consistently demonstrated that in vitro fertilization (IVF) pregnancy rates vary by the clinician performing the transfer (1–4).

ASRM formed an Embryo Transfer Advisory Panel to move this initiative forward. The panel collaborated with a leading medical simulation company, VirtaMed, to develop a virtual reality-based simulator for training in embryo transfer and intrauterine insemina-

tions. The panel also developed an extensive 82-question survey that was sent to all Society for Assisted Reproductive Technology (SART) medical directors and was completed by 41% of them. The results of that survey are summarized in this issue in the article titled, “Embryo transfer techniques: an ASRM survey of current SART practices” (5). Survey results were used to guide the development of the embryo transfer simulator and to determine common practices around embryo transfer. The results were also used to develop a “common practice” document that allows clinicians to review all of the steps of the embryo transfer procedure and better understand common practice. The survey article can be used to identify variations in clinical practice and potential areas for change.

As part of the embryo transfer initiative, a subset of the Embryo Transfer Advisory Panel served as a special task force of the ASRM Practice Committee to perform a systematic review of the literature around the major steps of the embryo transfer procedure. The goal of this work was to identify those parts of the embryo transfer procedure that are

supported by the literature as well as gaps in research for which the literature is unable to provide guidance. A new ASRM guideline, “Performing the embryo transfer: a guideline,” summarizes the findings of that extensive review and is also published in this issue (6).

Figure 1 combines the findings of both the systematic review of the literature and the embryo transfer survey of SART medical directors. In Figure 1 are 12 basic steps of the embryo transfer protocol adopted by the ASRM Practice Committee. A number of the steps are supported by evidence in the literature and the new ASRM guideline on performing the embryo transfer (6). For those steps not supported by the literature, data from the survey demonstrate common practice. While there are acceptable variations around some of the steps included here and the names given to some of the procedures may differ locally, the purpose is to fill a need for standardization. Literature on quality and safety is filled with evidence that standardization improves performance and safety (7). The embryo transfer survey paper demonstrates that only 50% of SART practices responding had a standard embryo transfer protocol for all of their clinicians to follow. The ASRM Standard Embryo Transfer Protocol Template provides associated evidence for all practices to use to model their own standard protocol.

Received February 21, 2017; accepted February 21, 2017; published online March 11, 2017.

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Fertility and Sterility® Vol. 107, No. 4, April 2017 0015-0282/\$36.00

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<http://dx.doi.org/10.1016/j.fertnstert.2017.02.108>

FIGURE 1

	ASRM Standard Embryo Transfer Protocol	Systematic Review/ Guideline (6)	Survey of SART Medical Directors (5)
Step 1	Prepare for the embryo transfer procedure by reviewing the prior mock or transfer patient notes for the level of difficulty and tips for guiding the procedure.		
Step 2	Prepare the patient for the procedure. Use analgesics and other techniques as needed for patient comfort but not for improving pregnancy rates (Systematic Review).	There is fair evidence that acupuncture performed around the time of the transfer does not improve pregnancy rates (Grade B). There is insufficient evidence to recommend for or against use of the other techniques (analgesics, massage, transcutaneous electrical acupoint stimulation [TEAS], whole-systems traditional Chinese medicine) specifically to improve pregnancy rates (Grade C). One randomized controlled trial (RCT) demonstrated that TEAS improves embryo transfer outcomes. However, there are no other studies.	Routine patient relaxant for transfer? Yes 46% No 54%
Step 3	Time-out process with identification and matching of patient and embryo(s) (Standard Expected Practice).		
Step 4	Use transabdominal ultrasound to assess the endometrial cavity and other pelvic structures and for guidance of the embryo transfer procedure (Systematic Review and Common Practice).	There is good evidence based on nine RCTs to recommend transabdominal ultrasound guidance during embryo transfer to improve clinical pregnancy and live-birth rates (Grade A). There is insufficient evidence to recommend for or against selective ultrasound guidance (Grade C).	Use of ultrasound guidance: Always 93% Selectively 4% Never 3%
Step 5	Practitioner preparation for the procedure should include some form of hand washing and sterile latex-free gloves (Common Practice and Standard Expected Occupational Safety and Health Administration [OSHA] Requirements).		Surgical mask? Yes 62% No 39% Sterile gloves? Yes 89% No 11%
Step 6	Place the speculum. Flush or cleanse cervix/vagina with cotton swab or gauze sponge using media or saline (Common Practice).		Cleanse cervix? Yes 96% No 4% With: Saline 17% Media 78% Other 2% N/A 3%
Step 7	Remove mucus from endocervical canal (Systematic Review and Common Practice).	There is fair evidence based on one RCT and a prospective cohort study that there is a benefit to removing cervical mucus at the time of embryo transfer to improve live-birth and clinical pregnancy rates (Grade B).	Remove mucus? Yes 75% No 25% How: Cotton swab 26% Flush 20% Both 31% Aspirate 6%

ASRM Standard Embryo Transfer Protocol Template.

ASRM. Embryo transfer protocol template. *Fertil Steril* 2017.

FIGURE 1 Continued

	ASRM Standard Embryo Transfer Protocol	Systematic Review/ Guideline (6)	Survey of SART Medical Directors (5)
Step 8	<p>Prepare the embryo transfer catheter and traverse the cervix using one of the following techniques. Common and acceptable variations exist and the names given to them may vary locally from how they are labeled here (Common Practice).</p> <p>Direct Transfer: The catheter is loaded with embryo(s) and the transfer is performed without a prior trial immediately preceding the transfer.</p> <p>Trial Followed by Transfer: A trial or regular embryo transfer catheter (both the inner catheter and outer sheath connected together in standard configuration) is used immediately before the actual transfer. It is passed up to and just through the internal os. When it appears that the actual transfer will be possible without great difficulty, an embryo transfer catheter is loaded and the transfer is performed.</p> <p>Afterload Transfer: The outer sheath of an embryo transfer catheter is separated from the inner catheter. The inner catheter is pulled back such that approximately 1 cm only of its tip is extending through the outer sheath. The two catheters are held together while traversing the cervical canal. Once the inner catheter has just passed through the internal cervical os and the outer sheath is positioned at the top of the cervical canal, the outer sheath is left in place while withdrawing the inner catheter. The inner catheter is loaded with embryos and threaded through the outer sheath into the endometrial cavity for expulsion.</p> <p>Trial Transfer Converted into an Afterload Transfer: If a Trial Transfer is difficult, once the inner catheter has passed the internal cervical os, the outer sheath is separated from the inner catheter and moved forward to the top of the cervical canal while withdrawing the inner catheter. As with the Afterload Transfer, the inner catheter is then loaded with embryo(s) and threaded through the outer sheath into the endometrial cavity for expulsion.</p>	<p>There is good evidence to recommend the use of a soft embryo transfer catheter to improve IVF embryo transfer pregnancy rates (Grade A).</p> <p>Data on live-birth rates and specific types of soft catheters are limited</p>	<p>Predominant technique used:</p> <ul style="list-style-type: none"> Direct 27% Trial followed by transfer 40% (Includes trial converted to afterload) Afterload 31%
Step 9	<p>Place the tip of the catheter at the ideal location: the upper or middle third of the endometrial cavity, no closer than 1 cm to the fundus (Systematic Review and Common Practice).</p>	<p>There is fair evidence based on seven studies (three RCTs and four cohort studies) that placement of the catheter tip in the upper or middle (central) area of the uterine cavity, greater than 1 cm from the fundus for embryo expulsion, optimizes pregnancy rates (Grade B).</p>	<p>Location of catheter tip:</p> <ul style="list-style-type: none"> Upper third 66% Middle third 29% Lower third 5% <p>Closest distance to fundus:</p> <ul style="list-style-type: none"> 0.5 cm 7% 1 cm 47% 1.5 cm 39% 2 cm 7%
Step 10	<p>Expel the embryos and withdraw the catheter immediately (Systematic Review and Common Practice).</p>	<p>There is fair evidence based on one RCT and one cohort study to recommend immediate withdrawal of the embryo transfer catheter after embryo expulsion (Grade B).</p>	<p>After embryo expulsion the catheter is removed:</p> <ul style="list-style-type: none"> Immediately 31% 5–10 seconds 33% 30 seconds 22% 1 minute 12% Other 2%

ASRM. Embryo transfer protocol template. Fertil Steril 2017.

FIGURE 1 Continued

	ASRM Standard Embryo Transfer Protocol	Systematic Review/ Guideline (6)	Survey of SART Medical Directors (5)
Step 11	Check the catheter for retained embryo(s) (Common Practice); if present, reload new catheter (Common Practice) and immediately re-transfer embryo(s) (Systematic Review).	There is fair evidence based on the secondary outcome of one RCT, nine cohort studies, and one series that retained embryos in the transfer catheter and immediate re-transfer do not affect implantation, clinical pregnancy, or spontaneous abortion rates (Grade B).	Retained embryos re-transferred in: Same catheter 33% New catheter 67%
Step 12	The patient gets up from the transfer table and leaves the room immediately, without routinely being provided any period of bed rest first (Systematic Review and Common Practice).	There is good evidence not to recommend bed rest after embryo transfer (Grade A).	Patient ambulates after transfer: Immediately 32% 5–10 minutes 13% 10–15 minutes 13% 15–30 minutes 27% 30 minutes 14% >1 hour 2%

Grade A: There is good evidence to support the recommendations, either for or against.
 Grade B: There is fair evidence to support the recommendations, either for or against.
 Grade C: There is insufficient evidence to support the recommendations, either for or against.

ASRM. Embryo transfer protocol template. *Fertil Steril* 2017.

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Acknowledgments: This report was developed under the direction of the Practice Committee of the American Society for Reproductive Medicine as a service to its members and other practicing clinicians. Although this document reflects appropriate management of a problem encountered in the practice of reproductive medicine, it is not intended to be the only approved standard of practice or to dictate an exclusive course of treatment. Other plans of management may be appropriate, taking into account the needs of the individual patient, available resources, and institutional or clinical practice limitations. The Practice Committee and the Board of Directors of the American Society for Reproductive Medicine have approved this report.

This document was reviewed by ASRM members and their input was considered in the preparation of the final document. The following members of the ASRM Practice Committee participated in the development of this document. All committee members disclosed commercial and financial relationships with manufacturers or distributors of goods or services used to treat patients. Members of the committee who were found to have conflicts of interest based on the relationships disclosed did not participate in the discussion or development of this document.

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