

# IVF Nursing

NEWSLETTER SERIES

## Egg banking: Advances in cryopreservation increase availability of donor eggs, enhance reproductive options for women

Deborah Mecerod is interviewed by Carol Lesser, Editor of this newsletter series

### EDITOR'S NOTE

#### Mastery of vitrification key to the recent growth of egg banks



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**H**uman sperm banking is an accepted and readily available method of gamete cryopreservation for those who desire it and has been an option since the mid-1950s.<sup>1</sup> The first successful in vitro fertilization (IVF) birth occurred in 1978,<sup>2</sup> followed in 1984 by a birth from a cryopreserved embryo.<sup>3</sup> Freezing of surplus embryos is an important adjunct to IVF in most countries, bringing tens of thousands of healthy babies into the world.

When I began working at Boston IVF in 1988, I asked my physician colleagues about egg freezing and why it was not readily available. I was told that, while theoretically possible, egg banking was not likely in my lifetime. I asked why and found the answer fascinating.

While human sperm contain only minute amounts of water, the human oocyte contains mostly water. The process of freezing water-filled eggs into a solid state often resulted in the formation of damaging ice crystals. Although the first birth that used a frozen human egg took place in Australia in 1986, the number of eggs required before this success was achieved was discouraging.<sup>4</sup>

The challenge for researchers was to devise a way to freeze human eggs without the formation of ice crystals. We can thank our Italian colleagues for many of the early advances in this pursuit.

In 1994, Italy passed a law prohibiting the insemination of more than 3 eggs.<sup>5</sup> Scientists recognized that this would negatively impact success rates and cycle efficiency and worked diligently to find a way to freeze extra eggs while retaining oocyte integrity and fertilization potential. They focused their efforts on 2 methods: slow freezing and vitrification.

While early research with slow freezing showed limited success, recent improvements and mastery of vitrification have led to the adoption of the technique by most IVF centers. Vitrification is a method of rapid flash freezing to preserve eggs. It uses more cryoprotectants (similar to antifreeze) than other methods in order to prevent ice crystal formation.<sup>6</sup> The American Society for Reproductive Medicine (ASRM) issued a recent statement that endorses vitrification and asserts that it is no longer experimental.<sup>7</sup>

Egg banks adhere to the highest standards for genetic testing of donors. They screen donors for genetic diseases based on the guidelines of the ASRM, the American Congress of Obstetricians and Gynecologists, the

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EDITOR'S NOTE *continued*

American College of Medical Genetics and Genomics, and national Jewish advocacy societies.

Although vitrification is more expensive than the slow freezing process, results are impressive, with comparable delivery rates reported in experienced centers to that of IVF using fresh eggs.<sup>8-10</sup> More than 1500 babies have been born from vitrified eggs worldwide, with no increase in congenital defects.<sup>11,12</sup>

Vitrification has the potential to revolutionize egg donation and fertility preservation, similar to the impact that intracytoplasmic sperm injection (ICSI) had on treating male factor infertility. It is the main reason for the continuing growth in the number of egg banks.<sup>11,12</sup>

Those of us who work with third-party reproduction are well aware of the prohibitive cost of donated eggs for many of our patients. Egg banking can be more affordable and has the potential to increase patient access to donated eggs because one donor may donate eggs for use by multiple recipients (with fresh eggs, the typical model is one donor per recipient). In addition, the use of frozen eggs eliminates the need for synchronization of cycles between donors and recipients.

Women undergoing treatment for cancer or another con-

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dition, during which pregnancy is contraindicated, may opt for fertility preservation by freezing eggs for future use. Egg banking could also provide an "insurance policy" for younger women who delay child-bearing and fear they may run out of healthy, fertile eggs before they are ready to have a baby. The capacity to freeze eggs can also be beneficial in those rare cases when the male

partner is unable to produce a specimen in the time needed after egg retrieval. It may also be of value for women with a family history of early menopause or for those who object to embryo freezing on religious grounds.

Egg banks have proliferated in recent years and it is expected that these services will further expand. For example, the center where I work recently joined Donor Egg Bank USA (DEB), a consortium of IVF centers launched by Shady Grove Fertility in Rockville, Maryland. Clearly, egg banking is here to stay.

In this issue's interview, our focus is on egg banking and we will speak with Deborah Mecerod, Director of Clinical Operations at My Egg Bank (MEB) in Atlanta, Georgia. We will learn about the hard work and determination that made this breakthrough possible and the role played in the process by this exemplary nurse.

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# Egg banks offer greater choice in donor selection, fertility preservation

An interview with Deborah Mecerod by Carol Lesser



Deborah Mecerod, RN

**Ms Lesser:** Please tell us about your work experience at Reproductive Biology Associates (RBA) in Atlanta and how that led to your involvement in developing MEB, where you currently serve as Director.

**Ms Mecerod:** In 2005, RBA's lab began freezing human eggs for storage with an institutional review board (IRB) approval as an investigational procedure. My position as Nurse Manager involved management of the nursing staff and the donor program. RBA's anonymous donor program had limited staff at the time when RBA decided to embark on a donor/recipient study.

I was asked to head up a truly amazing study in which 20 recipients received a free donation cycle, utilizing 10 of RBA's proven donors. The results were excellent: 15 of the 20 recipients had positive pregnancy outcomes in the first thaw of vitrified oocytes. Two recipients returned for frozen embryos and had positive pregnancy outcomes (vitrified oocytes thawed, revitrified as embryos, then warmed or thawed again for transfer), for a total of 17 pregnancy outcomes in the 20 recipients in this initial study.

**Ms Lesser:** When did interest in egg banking first emerge at your center?

For those who were against developing an egg bank, what were their concerns?

**Ms Mecerod:** After the initial 2005 study was validated through controlled clinical trials, RBA made the decision in 2007 to expand this technology to general IVF patients. RBA began to develop an inventory of vitrified eggs from select high-quality egg donors for use in the RBA anonymous donor program. This newer version of the donor program has virtually eliminated the fresh donation program.

As with any new Assisted Reproductive Technology (ART), the concerns are navigated with caution. The process of vitrification exposes oocytes to higher levels of cryoprotectant, which are known to be toxic. Additional concerns included future outcomes of children born as a result of a new ART procedure, the cost to start an

egg bank program (projected at over \$1 million), and the willingness of patients to accept this technology.

**Ms Lesser:** When did RBA begin to offer this service? How many cycles have you completed? How many babies have been born through your egg bank?

**Ms Mecerod:** The egg bank was opened for business in 2007 to patients of RBA. As of January 2013, the egg bank has completed over 1200 cycles. The number of babies born from My Egg Bank exceeded 600 at the end of 2012.

**Ms Lesser:** What is your pregnancy success rate at RBA?

**Ms Mecerod:** The pregnancy rate has remained consistent at around 63%.

**Ms Lesser:** Can you explain why ICSI is always used with frozen eggs? If there is severe male factor infertility, are vitrified eggs as good as fresh in those cases?

**Ms Mecerod:** Vitrification uses high levels of cryoprotectant and ultra-rapid cooling. There is evidence of zona hardening after the vitrification process, making traditional insemination more difficult. With egg banking, fewer eggs are inseminated; therefore, ICSI is preferred to eliminate the sperm/egg interaction of traditional insemination.

In the case of severe male factor infertility, it is highly recommended that fresh donor eggs be utilized. Typically, sperm parameters under 5 million (total motile concentration) result in suboptimal fertilization and embryologic outcomes.

**Ms Lesser:** How do you recruit your donors and how many active donors do you have at this time?

**Ms Mecerod:** The marketing team for My Egg Bank is very creative when it comes to recruiting donors. College campus visits, radio, and local newspapers are all used. Word of mouth or direct referral from established donors is another avenue for donor recruitment.

The number of donors is always in flux, with an average of around 75 to 80 donors at any given time. With the addition of 3 partner centers, the goal in 2013 is to increase the number of donors.

*The number of babies born from My Egg Bank exceeded 600 at the end of 2012.*

**Ms Lesser:** What incentives do you offer potential donors to participate in your program?

**Ms Mecerod:** Of course the monetary incentive is the primary motivation for most donors. As part of RBA's commitment to our donors, gynecologic health screening (Pap smear and physical) until the age of 30 is offered to the donor. A newer program, initiated in 2011, offers a "retiring" donor the option to freeze some of her own eggs on the last cycle at no charge. Eggs remain at the practice for 5 years without storage fees.

**Ms Lesser:** What protocols do you follow for donor stimulation and trigger and for recipient endometrial support? Do you rely on follicle-stimulating hormone (FSH) only or mixed protocols? Leuprolide triggers? Vaginal or intramuscular progesterone support?

**Ms Mecerod:** Successful donor outcome is based on a standard regimen of oral contraceptive pills, antagonist, and FSH protocols. On occasion, a mixed protocol is necessary. Ninety-five percent of the time, leuprolide trigger is given to donors.

Egg recipients follow a patch or estradiol valerate protocol. Progesterone replacement consists of progesterone in oil or a progesterone gel.

**Ms Lesser:** What is the cost for a cycle and what is a patient guaranteed?

**Ms Mecerod:** The cost of a recipient cycle is \$16 500 at RBA. Patients are guaranteed 2 high-quality embryos for transfer. If RBA does not meet the guarantee, then the patient is entitled to another cycle at no cost.

In 2010, RBA decided to expand the availability of cryopreserved donor eggs to other practices and a new company was formed as a separate entity called My Egg Bank, N.A. Currently, MEB is comprised of 3 additional partner groups that add eggs to inventory and has 27 affiliate practices that purchase eggs from MEB. The cost of 6 eggs is generally \$10 000, with the affiliate centers performing insemination and transfer.

**Ms Lesser:** Are you concerned that women will imagine they can delay childbearing indefinitely if egg banking becomes very popular? Do you see egg banking as a means of empowerment for women or as an act of desperation?

**Ms Mecerod:** Egg banking has been a revelation and is a beneficial technology for more than the recipient population. It is becoming a valuable tool for women who want to preserve their fertility. Couples with ethical and moral concerns about freezing embryos can now freeze eggs. With egg banking, women who have delayed childbearing have an alternate means to conceive.

For the recipient, the donor selection process is very similar to donor selection in fresh cycles: donor profiles, including photographs, family and medical history, and genetic screening results, can be reviewed online. Egg banking offers the additional advantage of access to a national network of donors, which is especially useful when a recipient seeks a donor with a specific or uncommon ethnic background.

**Ms Lesser:** With advances in vitrification, do you think egg freezing might replace fresh IVF as a way to decrease the problem of stockpiled embryos in the United States?

**Ms Mecerod:** Patients definitely have more options with the recent advances in vitrification. RBA has been freezing eggs for IVF couples for several years, with a decrease in stockpiled embryos. To date, we have seen no decrease in IVF fresh cycles as a result of the vitrification technology; however, the number of embryos created has been declining. Vitrification has revolutionized the donor egg process and given women yet another choice in third-party reproduction options.

#### DISCLOSURES

**Carol B. Lesser, MSN, RNC, NP,** reports that she has served as a consultant and on the Speakers' Bureau for Watson. She received compensation from Watson for her participation in preparing this newsletter.

**Deborah Mecerod, RN,** reports that she serves as a consultant and on the Speakers' Bureau for Watson. She received compensation from Watson for her participation in preparing this newsletter.

## Resources\*

### DONOR EGG BANK USA

Boston, MA  
www.donoreggbankusa.com

### FAIRFAX EGG BANK

Fairfax, VA  
www.fairfaxeggbank.com

### MY EGG BANK

Atlanta, GA  
www.myeggbank.com

### THE WORLD EGG BANK

Phoenix, AZ  
www.theworldeggbank.com

### GOOD START GENETICS

Cambridge, MA  
www.goodstartgenetics.com

\*Note: There are many egg banks throughout the United States that may be accessed by contacting IVF centers in your area.