



Dr. Ronald F. Feinberg of Reproductive Associates of Delaware consults with associate Dr. Adrienne B. Neithardt.

A New Era of In Vitro

A local couple reaches a milestone in reproductive science, pointing the way toward a whole new future.

BY THERESA
GAWLAS MEDOFF

Joy Simpson (her name changed to protect her family's privacy) made medical history when she arrived at Christiana Hospital in late January: She was the first baby in the state born from a frozen donor egg.

In vitro fertilization was earth-shattering news 30 years ago, when Louise Brown, the so-called test-tube baby, was born in England. Advances in assisted reproductive technology have since made IVF increasingly common.

Using frozen sperm is nothing new. By the late 1980s it had become the norm. The first birth from a frozen embryo occurred in 1984. By 2000, frozen embryos accounted for 16 percent of pregnancies from assisted reproductive technology.

But oocyte cryopreservation, or egg freezing, proved difficult. Slow freezing and thawing tended to create knife-like ice crystals that could damage the egg, says embryologist Marc Portmann of Reproductive Associates of Delaware. The newer process of

vitrification, an ultra-rapid method of freezing that creates a glass-like solid, minimizes that danger.

Of the 1,000 pregnancies from frozen eggs since the first in 1997, most have occurred during the past several years, largely because of the advances in vitrification, according to Dr. Michael Tucker, a pioneer in the field and scientific director of Georgia Reproductive Associates. Clinical pregnancy rates with vitrified eggs are nearly twice those achieved with slow frozen eggs.

"This is a very exciting time," Tucker says. "It's the first step in a new era of IVF."

And it's a change that is coming about rapidly. Jeffrey B. Russell, director of the Delaware Institute for Reproductive Medicine, predicts that rapid freezing of eggs may replace the older method within a few months. Since opening his practice in 1986, Russell has been a leader in several IVF developments, including the now-standard single-sperm injection

pregnancy, or ICSI, which allows men with low sperm counts to successfully father a child.

Joy's parents became part of the new era of frozen egg IVF largely out of frustration. The Simpsons, Francine, now 43, and Rob, now 37, married six years ago. Their first pregnancy ended in miscarriage, and their second was determined to be ectopic, so they sought Reproductive Associates of Delaware.

Infertility affects about 12 percent of women of childbearing age. More than 85 percent of those who seek medical assistance are treated successfully with drug therapy or surgical procedures. Fewer than 3 percent need advanced reproductive technologies such as IVF. In most IVF pregnancies, the woman's own eggs are used. For some, however, pregnancy is possible only with donor eggs.

That turned out to be the case for Francine, who gave birth to her first daughter, Isabelle, in 2007, after more than three years of trying to become pregnant. Early attempts at artificial insemination failed. So did several efforts at IVF using Francine's own eggs. The Simpsons' last chance at having a child of their own was IVF using a donor egg.

Isabelle arrived strong and healthy. A year later, Francine and Rob were ready for a second child. The Simpsons returned to Feinberg, hoping to duplicate their success, but there were complications.

"The donor—it was the same as our first child—wasn't producing enough eggs," Francine says. So the Simpsons purchased frozen eggs from Cryo Eggs International. The first frozen donor egg bank, Cryo Eggs is still one of only three in the world.

"Our main reason for using frozen eggs was that we knew the eggs were viable at the time they were frozen, and the whole process would be faster," Francine says—two months instead of the three to six typical with fresh eggs.

Use of frozen eggs has several other advantages, Portmann says. There's no need to coordinate the woman's cycles, the donor no longer needs to travel to the recipient's location and, as egg banks become more prevalent, the recipient will be able to choose from a larger number of donors.

IVF is expensive, but egg banks allow costs such as donor compensation, medical insurance, and genetic and psychological evaluations to be shared by several recipients. Reproductive Biology Egg Bank reports that frozen donor eggs can be provided to recipients at about half the cost of fresh egg cycles.

Frozen egg banks could also have benefits for society, proponents say. Many times a donor produces 15 to 20 eggs, far more than a recipient needs. Some couples choose to create and freeze extra embryos for use later. Other times, excess eggs go to waste.

Through an egg bank, a donor could provide eggs for three infertile women instead of one, Feinberg says. Routine freezing also could decrease the number of excess embryos that are frozen, thus obviating some moral issues, as well as the legal wrangling over the embryos that can take place when couples divorce, Tucker says.

Yet egg freezing is unlikely to become routine until the American Society for Reproductive Medicine changes its classification from "an experimental procedure." If egg freezing were no longer considered experimental, Feinberg says, two groups of women would benefit: those who want to preserve fertility before undergoing treatment for life-threatening diseases such as cancer, and "women who want to keep options open" by freezing young, healthy eggs for a pregnancy later in life.

Russell is working on a method to harvest immature eggs without the use of fertility drugs, then mature the eggs in the lab. The process would be less expensive, and it would appeal to women who do not want to use fertility drugs or who fail to respond to fertility drugs, Russell says.

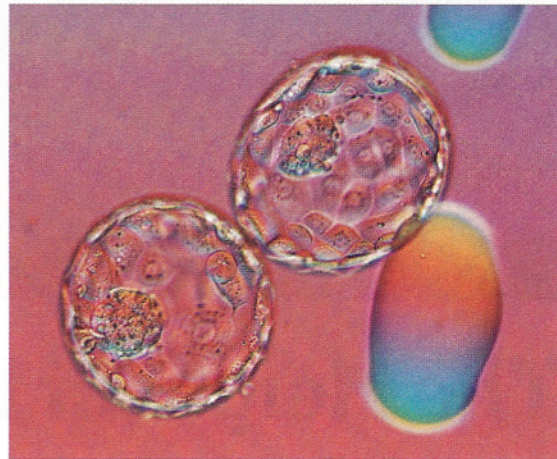
Though the number of women who elect to freeze eggs remains low, the buzz about vitrification could change that. "There appears to be a tide change of acceptance of cryopreservation," says Tucker.

Both Delaware Institute for Reproductive Medicine and Reproductive Associates of Delaware offer egg freezing. Women in their early 40s usually ask doctors about freezing eggs to preserve fertility. Though younger eggs are more viable, women in their 20s and 30s do not feel the same urgency, especially since the cost can

be \$5,000 for retrieval and storage, Russell says.

Debate continues about the costs and benefits of freezing eggs and whether it gives women false hope about their ability to delay pregnancy, though some professionals have equated egg freezing with the pill for its ability to liberate women.

A recent article in the American Society for Reproductive Medicine's journal *Fertility and Sterility* predicted recent advances in vitrification will make it "the method of female fertility preservation that will be widely used in the near future." □



These five-day old blastocysts are at the stage when most embryos are transferred during an IVF cycle.