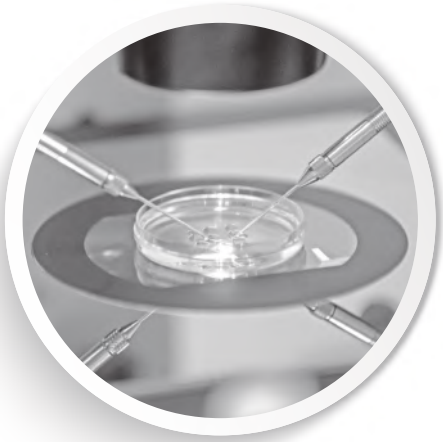


from the front page

A DAILY SUN SPECIAL REPORT

The 5 Steps of The IVF Process

In vitro fertilization (IVF) combines a woman's egg and a man's sperm in a laboratory dish, rather than inside a woman's body, to help couples who have trouble conceiving on their own. There are five basic steps:



1

STIMULATION, ALSO CALLED SUPER OVULATION
Medicines given to the woman boost her egg production. Normally, a woman produces one egg per month. Fertility drugs tell the ovaries to produce several eggs.

2

EGG RETRIEVAL
Using ultrasound images as a guide, the health-care provider inserts a thin needle into the ovary and sacs containing the eggs. The needle is connected to a suction device, which pulls the eggs and fluid out of each follicle, one at a time. The procedure, called follicular aspiration, is then repeated for the other ovary.



Consultant gynecologist Dr. Patrick Steptoe, one of the pioneers in the fertilization of human eggs to make a "test tube baby," works in his lab in 1970.

MIRACLES

Continued from A1

The number of infants born through assisted reproductive technologies in the U.S. has doubled in the past decade, according to the Centers for Disease Control and Prevention.

A woman Talwar's age can expect a success rate of 22 percent, dropping to 4 percent for women over 42, according to the Society for Assisted Reproductive Technology. But for women under 35 using their own eggs, the odds have improved dramatically.

In 2015, a woman in that age group had a 42 percent chance of an egg retrieval cycle ending with a live birth on the first cycle.

"Thirty years ago, you were lucky to have a 10 percent take-home baby rate in that group," said Dr. Stan Williams, professor and chairman of the Division of Reproductive Endocrinology and Infertility in the Department of Obstetrics and Gynecology at the University of Florida.

"We've come a long way," he said. "Who knows what's going to be state-of-the-art 30 years from now?"

In 2016, 1.7 percent of babies born in the U.S. — 76,930 — were conceived using assisted reproductive technologies, according to the CDC.

Even with its large population of senior citizens, the Sunshine State contributed 3,002 of them.

Only California, New York and Texas are more active in IVF than Florida. The state operates 28 of the nation's 498 clinics.

The closest clinic to The Villages also is one of the state's oldest, the Center for Reproductive Medicine in Orlando.

It opened in 1985, seven years after Louise Brown's birth in England as the world's

first "test tube baby."

In the U.K., Dr. Patrick Steptoe had perfected the process of egg retrieval while Dr. Robert Edwards unlocked the secret to creating embryos in a petri dish (which won him the Nobel Prize).

"My mum and dad were just ordinary people who wanted a baby," Brown, now a mother herself, told the Daily Sun. "They weren't looking to change the world, but they did."

The world was stunned by this new, weird science.

The Catholic church denounced it as godless and immoral.

Some governments refused to fund its research.

The New York Times warned of "assembly-line fetuses grown in test tubes."

There was talk of human-animal hybrids, monstrous "frankenbabies," eugenics and all kinds of scary reproductive engineering.

And it was unpredictable science; success rates in the early years averaged only 12 percent.

But that didn't deter couples around the world from lining up.

When the University of Miami delivered Florida's first IVF baby in 1983, its waiting list was six months long.

Five years later, Dr. Williams was at UF for its first birth.

"It was a tremendous feeling, because I knew from my training days that IVF pregnancies in those days were very difficult to come by," he said. "To step in the door and have one of our first patients become pregnant right off the bat was almost a miracle."

Today, the university's success rate has climbed to 50 percent for women younger than 35, he said.

Centers nationwide have seen similar increases, he said,

Please See NEXT PAGE

THE CHANCE OF GIVING BIRTH TO A LIVE BABY AFTER IVF

41%-43%
chance of giving birth for woman under age 35

23%-27%
chance of giving birth for women ages 38 to 40

13%-18%
chance of giving birth for women age 41 and over

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from the front page

3

INSEMINATION AND FERTILIZATION

Sperm is placed with the best quality eggs, then stored in a controlled chamber. If the doctor thinks the chance of fertilization is low, sperm may be directly injected into the egg. Many fertility programs routinely inject some of the eggs, even if things appear normal. Donor eggs or donor sperm can be used if necessary.

4

EMBRYO CULTURE

A fertilized egg begins to divide, becoming an embryo. Laboratory staff will regularly check the embryo to make sure it is growing properly. Within five days, a normal embryo has several cells that are actively dividing. Several days after fertilization, scientists may remove a single cell from each embryo to check for specific genetic disorders that have a high risk of being passed from the parents to a child.

5

EMBRYO TRANSFER

Embryos are placed into the woman's womb three to five days after egg retrieval and fertilization. If an embryo sticks to the lining of the womb and grows, pregnancy results. More than one embryo may be placed into the womb at the same time, which can lead to twins, triplets, or more. The exact number of embryos transferred depends on many factors, especially the woman's age.

Continued from Previous Page

due to better medications and embryo handling.

The 1980s brought ultrasound guidance to harvest a woman's eggs instead of invasive abdominal surgeries under general anesthesia.

Then the medications that increase egg production improved.

But the biggest gains have been made in the embryology lab.

Intracytoplasmic sperm injection has revolutionized male infertility treatment, allowing an embryologist to inject a single sperm into the middle of an egg.

"We were able to really open the doors to men with severe sperm abnormalities," Williams said. "Prior to ICSI, they really didn't reproduce at all."

Refined incubator conditions and egg-handling procedures also have improved the environments in which embryos are grown.

And embryos are now grown longer — typically for five days instead of two — before implantation.

In the early 1990s, scientists learned to freeze embryos for future use without damaging them.

And in the last decade, scientists have perfected egg freezing.

With the ability to store their younger eggs, more women are able to give birth in their late 30s and 40s.

"I would not change this profession for anything in the world," said Dr. Silvina Bocca, professor at The Department of Obstetrics and Gynecology Eastern Virginia Medical School, where Elizabeth Carr, America's first IVF baby, was conceived. "The best gift you can have is these mothers coming back to show you the baby."

An Expensive Journey With Uncertain Results

Despite significant medical strides, the economics of IVF still lock out many couples.

Florida is not among the 15 states that mandate insurance companies offer coverage for infertility treatments.

Some clinics offer discounted financing, and some nonprofits award grants, but it's not enough to help all of the 1 in 8 U.S. couples who have trouble getting pregnant or carrying a pregnancy to term.

A single IVF cycle costs between \$7,000 and \$20,000, Bocca said, depending on the state.

"Insurance companies don't consider infertility as a medical problem," she said.

Necessary medications can cost an extra \$6,000.

Women with insurance coverage for IVF are more likely to become moms because they are more likely to undergo multiple IVF cycles, a 2017 study by Washington

University School of Medicine in St. Louis found.

"It's a simple, and possibly obvious, finding, but it highlights the importance of health insurance in the outcome of fertility treatments," wrote Dr. Emily Jungheim, the study's lead author.

Other countries, including many European nations, require coverage for IVF.

"(IVF) has been gradually increasing over the years, but the U.S. per capita performs much less IVF than European countries," Williams said.

More than 4 percent of all babies born in Belgium, the Czech Republic, Denmark, Estonia, Greece and Slovenia were conceived through assisted reproductive technologies compared to America's 1.6 percent, according to the European Society of Human Reproduction and Embryology.

More Americans are choosing to travel for treatment.

The Barbados Fertility Centre says demand by Americans for its services has increased 150 percent in the last four years.

At its center, an IVF cycle starts at \$6,000, including medications.

"More than 50 percent of my consultations now are American patients," said Dr. Juliet Skinner, medical director of the center, who held a conference in Miami last week.

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Sang Tan | The Associated Press

An embryologist works at the Create Health fertility clinic in south London. Since the first test-tube baby was born four decades ago, in vitro fertilization has become a sophisticated process with pricey incubators, specialized techniques and extensive screening.

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