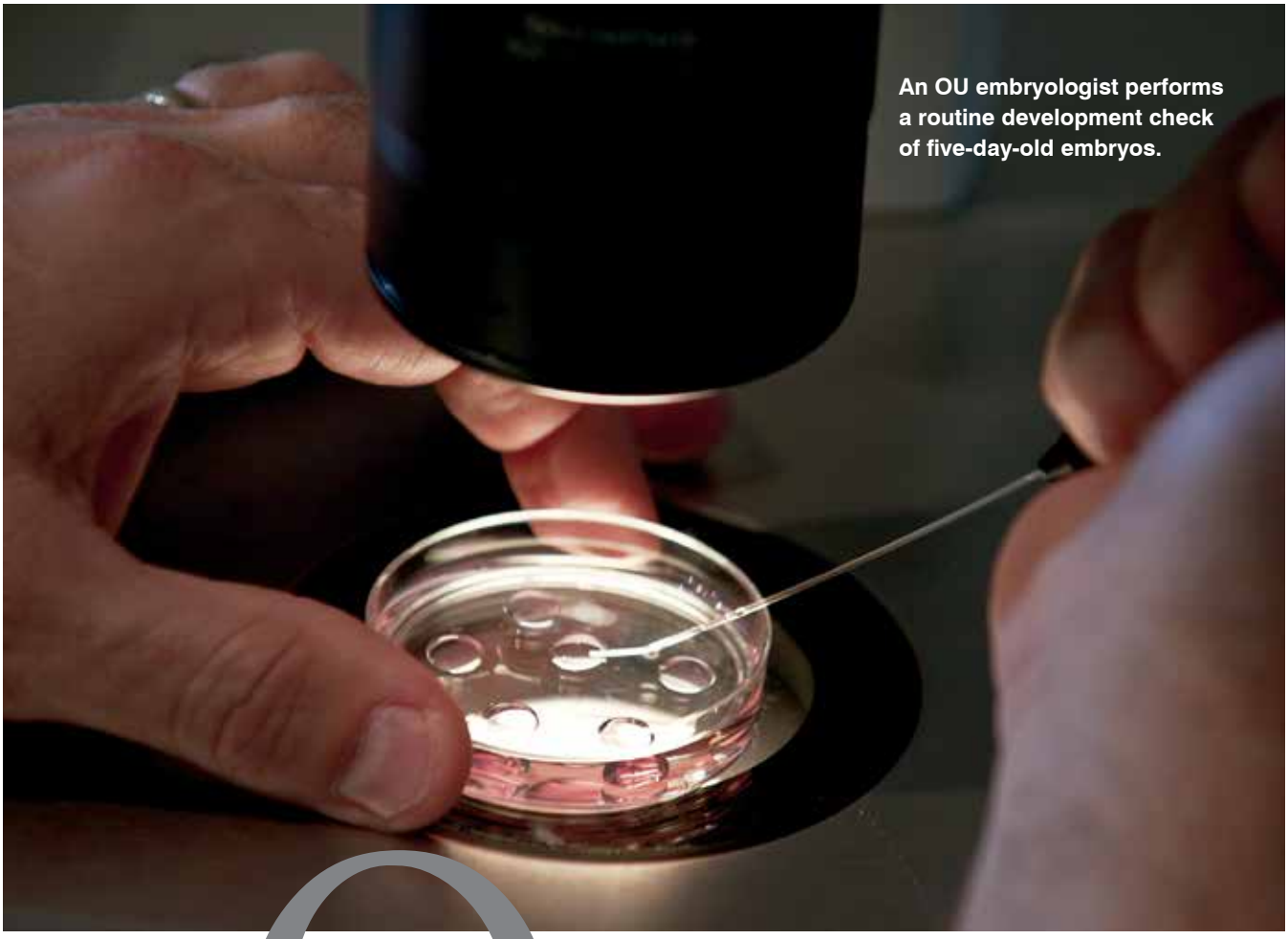

An OU embryologist performs a routine development check of five-day-old embryos.

By April Wilkerson

Overcoming INFERTILITY

The Reproductive Medicine program at OU Medicine is helping couples reach their dream of becoming families.

Stephanie O'Hara is achingly familiar with the cascade of emotions that accompany treatment for infertility.

Grief. Worry. Loss. Isolation.
But, most powerfully, **hope.**

In many ways, the Reproductive Medicine program at OU Medicine in Oklahoma City is in the business of hope. A compassionate group of physicians and staff, using modern science and technology, often restores hope to couples who thought their dream of having children was lost. With a range of treatment options at hand, including in vitro fertilization, they can facilitate a pregnancy and become part of a dream come true.

O'Hara and her family embody the desire to never give up hope. After a total of seven miscarriages and years of bad news, O'Hara attained her dream of having more children with help from the OU Reproductive Medicine program. Today, her twins, Stella and Smith, who were frozen as embryos for two years, are about to turn 3 years old.

"I had nearly resolved in my head to give up hope," says O'Hara, a Norman resident and OU graduate. "Today I am so grateful and blessed."

Building a Program

OU's Reproductive Medicine program began 14 years ago this summer and was built from the ground up. OU College of Medicine alumnus Karl Hansen, M.D., Ph.D., was recruited back to campus in 2004 to launch and grow the program as part of the academic medicine mission at the OU Health Sciences Center. The benefit of being in an academic setting is that physicians not only offer clinical services, but also conduct research and train the next generation of reproductive medicine doctors.

Soon after he arrived, Hansen recruited LaTasha Craig, M.D., to join the practice, and three years ago, they added Heather Burks, M.D. Together with a group of advanced practice providers and staff, they will see nearly 15,000 patients this year and will conduct about 275 cycles of in vitro fertilization.

According to the Centers for Disease Control, about 10 percent of women in the United States have difficulty getting pregnant or staying pregnant. Infertility is defined as a couple not achieving pregnancy after a year of unprotected intercourse. For couples over age 35, the time frame drops to six months. The causes for infertility, when known, are evenly split between males and females.

"We've built an incredibly successful program here. It is a challenge to build a program from the ground up, but it's been well worth it, and we're not at the end of our road yet."

"It's incredibly rewarding work," says Hansen, who also serves as chairman of the Department of Obstetrics and Gynecology in the OU College of Medicine. "It's such an exciting moment for couples when they learn that they're pregnant. I like to think that we're in the business of building families."

Treatment Options

For couples who meet the clinical definition of infertility, a basic workup of both partners is the first step. Physicians check for ovulation in the female, make sure her fallopian tubes are open and measure her quantity of eggs. The male partner's semen is analyzed, and if sperm numbers are low, the clinic may refer him to Mark Lindgren, M.D., an OU urologist who is fellowship-trained in male infertility.

Cost is almost always on the forefront of patients' minds, but the dollar amounts frequently aren't as high as imagined. A patient's basic workup is usually covered by insurance, and many couples can become pregnant by taking medicine or undergoing procedures that are reasonably priced.

"For example, for a woman who is not ovulating, the most common diagnosis is polycystic ovarian syndrome," Craig says. "For that condition, a woman can take a pill for five days that costs about $20 at the pharmacy, and 85 percent of women will ovulate on this inexpensive medicine."

In addition to several medications that treat infertility, physicians can perform intrauterine (artificial) insemination, a procedure now considered routine. The good-quality sperm of the male are concentrated, then inserted into the female's uterus during the window of opportunity for fertilization.

For patients who have not achieved pregnancy through other treatments, in vitro fertilization may be the next step. IVF is a highly effective procedure but, unlike other treatments, is very expensive and often not covered by insurance. In IVF, a woman's body is stimulated to grow multiple eggs, which are then removed from her body with a needle and placed with her male partner's sperm. After a few days in culture, one or two embryos are placed

"I like to think we are in the business of building families," says Dr. Karl Hansen (center), alongside fellow OU Reproductive Medicine team members Dr. LaTasha Craig (left) and Dr. Heather Burks.

back into the woman's uterus.

"The success rate with IVF is much higher than with other treatments, but it's so much more expensive and comes with more hormonal changes and injections," Craig says.

Overall in OU's Reproductive Medicine Clinic, the pregnancy success rate for females under the age of 35 is between 50 and 60 percent, with a delivery rate of 50 percent. As women age, their pregnancy success rate drops.

Advances in Technology

Because women don't ovulate only during weekday business hours, the Reproductive Medicine Clinic is open seven days a week, no matter the weather. A large and highly trained multidisciplinary team works in the clinic's embryology laboratory and continually tests sperm and hormones for same-day results. Ultrasounds are critical to patients' care and cannot be missed. One year, during a blizzard that snowed in much of the city, Craig grabbed a shovel and went to help one of her patients who had gotten stuck in an intersection.

The clinic also offers the latest in cryo-preservation. For years, reproductive specialists have been successful in freezing sperm as well as embryos – the eggs that are already fertilized. But because the egg is the largest cell in the body and contains the most fluid, it has been harder to freeze. Today, a process called vitrification – a rapid-freezing technology – contains cryo-protectants that safeguard the eggs from the shock of the freeze.

Cryo-preservation is an option for women who are about to undergo chemotherapy or radiation for cancer, which may affect their fertility. In such a case, the couple would undergo IVF and then have the embryos frozen. The technique also is an option for women who don't yet have a partner to fertilize her eggs.

"In that case, women may choose to freeze their eggs electively, recognizing that fertility declines naturally with age, and they want to preserve their ability to have a pregnancy later," Hansen says.

If a woman decides to freeze her eggs at age 30, then uses

An OU embryologist performs a routine development check of five-day-old embryos

them for a pregnancy at age 38, the pregnancy will take place as if the mother is still 30 years old. "It's as if they're frozen in time," Craig says. "Likewise, their risks for miscarriage or conditions like Down Syndrome are related to the day the eggs were frozen, not the mother's current age."

Technology also now allows physicians to screen embryos for genetic disorders prior to implantation. For example, if the parents are known carriers for cystic fibrosis, they have a 25 percent chance of passing the condition along to a child. Embryos can be tested for the condition, and only the unaffected embryos are implanted. Similarly, embryos can be tested for aneuploidies, or an abnormal number of chromosomes in a cell, which may prevent the pregnancy from being viable.

Research and Education

In 2014, OU's reproductive medicine team received a $1.5 million grant from the National Institutes of Health to participate in the Reproductive Medicine Network. OU is one of only six academic centers nationwide to participate in a variety of infertility research projects. Participation in the network not only helps to further the standard of care nationally, but allows Oklahoma women the opportunity to access infertility treatments they might not otherwise be able to afford.

One major study, for which OU led the nation in enrollment, involves examining the role of weight loss in helping women with otherwise unexplained infertility. Participants are randomized into two treatment arms – one increases their physical activity only; the other increases activity and puts them on a diet supplied by the program. If, after 16 weeks of participation, they're not pregnant, they receive three treatments for unexplained infertility.

Another ongoing study addresses male factor infertility by focusing on the role of antioxidants in improving sperm counts. Yet another Reproductive Medicine Network study is evaluating various approved treatments for pregnancies of unknown location, in which a pregnancy test is positive but

the pregnancy cannot be located. This situation puts a woman at risk for an ectopic pregnancy.

OU's reproductive medicine physicians conduct a number of other research projects outside the Reproductive Medicine Network. Craig has a federal grant to study disparities and outcomes in fertility treatment among different races and ethnicities, particularly Native Americans. In a study that was recently published, she discovered that fertility is lower in Native Americans undergoing treatments, although the reasons are unknown as yet.

Craig's other research projects include studying the role of autoimmunity in polycystic ovarian syndrome and looking at the microbiome of semen, a couple's shared microbiome and their possible effects on reproductive health. Microbiome research involves studying bacteria at its genetic level.

A consistent thread through all areas of the reproductive medicine program is the educational component. The fellowship in reproductive endocrinology and infertility now has three fellows – a full complement for the three-year training program. Fellows take part in both clinical and research activities to further cement their knowledge and skill in the specialty.

"We've built an incredibly successful program here," Hansen says. "It is a challenge to build a program from the ground up, but it's been well worth it, and we're not at the end of our road yet. For academic physicians like us, it's the pinnacle of where we want to be – taking care of patients locally, contributing research to what will become the next standard of care nationally, and educating our next generation of physicians."

The journey through infertility ended in joy for the O'Haras with the birth of twins Stella and Smith, now 3 years old.

Hugh Scott

Telling Her Story

That's good news to people like Stephanie O'Hara, whose long journey with infertility included treatment at OU's Reproductive Medicine Clinic. O'Hara and her husband, Dirk, ultimately partnered with a gestational carrier for the embryos they opted to freeze in 2013. The pregnancy was healthy, and Stella and Smith were born on Labor Day 2015, carried by a woman who O'Hara calls one of her angels. The twins join the O'Haras' son, Aidan, who was born in 2008.

O'Hara is writing a book about her family's six-year journey with infertility, sharing the deepness of her despair in the hope that others in her shoes won't feel ashamed. Infertility affects people of all races and walks of life, yet experiencing it can be isolating. O'Hara's message is two-fold – that they're not alone and that renewed hope may be just around the corner.

"I like to say that I had so many angels sent to guide and support me," says O'Hara, who also blogs about her journey at *www.youranglewings.net*. "My story is about infertility, but it's also a story of hope and not giving up. I hope that by sharing my story, I can help others face their challenges, too."

April Wilkerson is the editor of OU Medicine.