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The Infertility Specialists

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By Annemarie Cronin

Sometimes great things happen when the right group of people comes together under the right set of circumstances when compelling questions need to be answered. It happened with Watson and Crick in 1953, when they discovered the structure of DNA, opening up the whole genetic storyboard and setting the stage for gene mapping and a lifetime of bold new discoveries. In the field of infertility, we are again crossing great borders and leaping over chasms once thought impossible to overcome. Patrick Steptoe, the pioneering gynecologist from King's College London, and his lab partner, Robert Edwards, a Cambridge physiologist, broke ground and shook the foundations of what was thought possible by delivering the world's first baby conceived through in vitro fertilization (IVF). Dubbed the "test tube baby," the birth of a healthy Louise Brown in 1978 heralded a brave new world for infertile couples. As research marches forward, couples once devastated by the sentence of infertility can now enjoy the hope of achieving parenthood through the ever-advancing field of IVF. It takes more than just science, however, to cross the bridge from fertilization to live birth. It takes the right doctors, the right environment, the right science and the right scientist.

RMA of Michigan offers physicians with patients struggling with fertility issues the opportunity to explore the treatment opportunities available at their new 13,000-square-foot facility and state-of-the-art CAP-accredited laboratory in Troy. RMA of Michigan, which opened on November 1, 2006,

Drs. Miller and Wolf consult with a patient.



PHOTO BY JUEL ZAMPLAS

based their model on the highly successful RMA of New Jersey under the leadership of Richard T. Scott, M.D., and the equally successful Colorado Center of Reproductive Medicine, directed by Dr. William Schoolcraft. A partnership was formed here in Michigan, with physicians all board certified by the American Board of Obstetrics and Gynecology in both general obstetrics and gynecology and in reproductive endocrinology and infertility.

Dr. Bradley Miller brought with him the experience from the New Jersey facility, where he had worked for six years. Accumulating a vast experience during his tenure there, Dr. Miller has personally performed over 1,400 oocyte retrievals, 3,000 embryo transfers and more than 5,000 IVF stimulations. According to Dr. Miller, it is the combination of expertise and a team approach to patient care that makes for a highly successful outcome. "We have designed a state-of-the-art lab to take care of the patient's embryos," he says, pointing out that the highly personalized, one-on-one care is what sets them apart. Rather than rely on support staff, the doctors do their own scans and spend a great deal of personal time with each patient, explaining what they are doing and what is happening. Pursuing his earlier research, Dr. Miller points out, "We want to produce a baby, but at the same time to control and lower the multiple rates because of the many complications associated with prematurity and ensuing developmental issues. For couples concerned about the risk of multiple births following fertility treat-

ments, they can feel confident that as a result of Dr. Miller's work, he was able to produce almost 70% singletons among his successful number of live births. He continues to focus his clinical research on decreasing the number of multiples in IVF through the utilization of extended embryo culture and elective single blastocyst transfer.

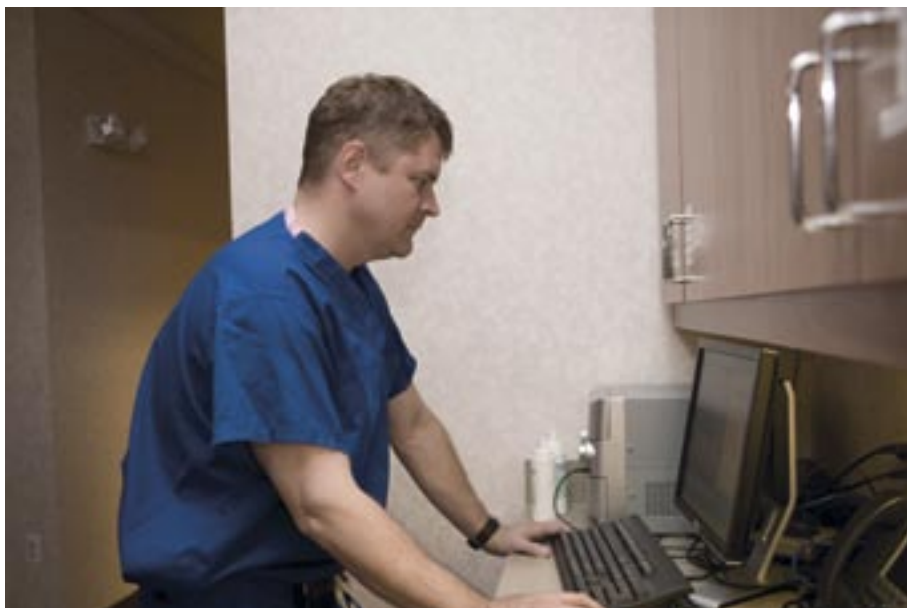
Dr. Miller feels that "by decreasing multiples, we have a better chance of getting a healthy baby in the end. Our goal is to be able to transfer one embryo that will result in a healthy child."

Dr. William Key, board-certified reproductive endocrinologist, obstetrician and gynecologist, and past director of the Division of Reproductive Endocrinology and Infertility at William Beaumont Hospital in Royal Oak, MI, brings to the practice a lifetime of experience and credentials. Dr. Key is well known in the field for his award-winning research and for having produced more than 100 scientific

publications, as well as having edited five textbooks for physicians on surgery, premenstrual syndrome and infertility. He has lectured or taught reproductive surgery at many of the major universities and hospitals, both here and abroad, and is highly regarded as a pioneer in reproductive medicine. His current research and clinical work includes the medical and psychological aspects of infertility, recurrent miscarriages and IVF.

Dr. Lynda Wolf knew early on she wanted to be a doctor. The most important male in her life was an uncle who was a doctor, and her first aspirations were to complete her medical degree and go into practice with him. All that changed during her OB/GYN rotation at the University of Minnesota during her fourth year of medical school. "I made up my mind that I wanted to take care of women," she says. Eventually, after having gone through training in reproductive endocrinology, she realized that she wanted to teach residents who could take care of thousands of women. "I went to the Medical College of Ohio so that I could teach residents," she says, "and then I went to Beaumont to train residents." Realizing how many women's lives could be positively affected through teaching, she points out, "Training the physicians of the future is an important part of what we do." In this type of work "you really need to see a board-certified doctor that has had the special training we have had," she adds.

"We understand what the developing embryo needs," says Dr. Wolf. This is evident as you take a tour through the facility and



Dr. Miller checks updates between patients

PHOTO BY JUEL ZAMPLAS

experience the attention to the small as well as the large details. A serendipitous addition to the treatment regimen is the inclusion of acupuncture and reiki therapy. In addition to the age of the female, it is a well-known factor that stress plays an important part in the ability to conceive. "We have been looking at how stress impacts fertility, and we know it does," says Dr. Wolf. Studies in the field of acupuncture done four years ago showed a marked improvement in pregnancy rates. There was a dramatic difference when attention was paid to stress relief. It is for this reason that acupuncture is part of the all-encompassing program at this facility.

Dr. Tariq A. Shah, Ph.D., is the Director of the IVF/andrology and endocrine laboratories. Board certified as an embryology laboratory director as well as a high complexity clinical laboratory director, he came to RMA of Michigan with more than 20 years experience in the field of clinical embryology and andrology. His work in the lab at RMA of Michigan includes all aspects of IVF, such as intracytoplasmic sperm injection (ICSI), cryopreservation of oocytes and embryos and preimplantation genetic screening and testing. "We can now literally pick up one sperm, inject it directly into the egg and get the same outcome," says Dr. Shah. Even if the patient presents with poorly mobile sperm or no sperm present in the sample, but is still producing a low number of sperm in the testes, "we can go ahead and get sperm directly from the testes and still get a pregnancy," says Dr. Shah. One of the board-certified urologists from the adjoining facility, Michigan Institute of Urology, will come in and do a testicular biopsy, rendering live sperm from the tissue sample. Through utilizing ICSI, a single sperm can be picked up and injected into an egg retrieved from the female. Within 14 to 16 hours after injection, it is evident which ones are fertilized. Although many eggs can be fertilized using this technology, only one to three will be implanted. The rest will be frozen in the state-of-the-art embryo freezing equipment known as programmable biological freezers, which will freeze an embryo over a period of 100 to 120 minutes. At the end of two hours of slow freezing, the embryo is placed in liquid nitrogen tanks, where they can be stored indefinitely. These tanks are monitored 24/7 through personal alarm systems. On the third day after fertilization, a biopsy can be taken by





Dr. Shah at incubator

removing one of the eight cells, and 24 hours later, the results will show if there are any chromosomal abnormalities. If a defective gene is found, the whole cell is considered to be abnormal and that embryo would not be implanted. On either day three or day five, the resulting healthy embryos are ready for implantation. Some of the remaining embryos will be frozen for possible future pregnancies.

The combination of expertise, skill and technology have increased the odds of success for those infertile couples who, in the not-too-distant past, felt hopeless. The skill comes with the ability, through a micromanipulation system of allowing the insertion of a single sperm into an egg. Beyond this, according to Dr. Shah, "Having extremely efficient and reliable incubators that mimic the gaseous composition of

Dr. Shah examining embryos



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Dr. Shah at IVF workstation

the fallopian tube and uterus, and which are monitored 24/7," secures the harboring of the embryos. Every detail has been thought and rethought. Embryos and sperm are cultured in extremely high-quality, nontoxic tissue culture plastic ware. Those are not only tested at the factory site that produced them but are retested at RMA of Michigan using biological assays. "We make sure that those tissue culture plastic ware tubes are not toxic to cells or embryos."

As Dr. Shah reflects on the work that drives him to the lab very early in the morning, he explains, "We pride ourselves on our state-of-the-art laboratory. Our focus is on continuous quality improvement and cost reduction to make this technology affordable to couples pursuing their dreams of having children. My wife and I are blessed with two beautiful daughters who are the joy of our lives. I want to do all that I can to help couples so they may experience that same joy one day."

What does it take to run a very successful IVF lab? It is the constant focus on quality control, intensive training and continuing medical education and training of personnel.

Dr. Miller is propelled forward in his work by both a personal and professional commitment to help create families for couples. "I am personally and professionally privileged and honored to do this."

Patrick Steptoe would have been proud. ■



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