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Dr. Benjamin Sandler is in the business of making his patients' dreams come true. At the Reproductive Medicine Associates headquarters in New York City, where he is co-director, he explains the complicated processes and precise techniques through which he makes parenting possible for families of every kind. One-thousand babies are born via the RMA's programs each year, and he has personally participated in the birth of more than 25,000. An assistant clinical professor at the Mount Sinai School of Medicine and attending physician at Mount Sinai Medical Center in New York, he completed his residency in obstetrics and gynecology at Michael Reese Hospital and Medical Center in Chicago after leaving Mexico where he was born. In 2001, he received the American Fertility Association Family Building Award for his years of dedication and commitment to the treatment of couples experiencing infertility. With a huge success rate, he is considered one of the top specialists in the country.

**LL: Why did you become interested in this field?**

**Dr. S:** When I was a resident in obstetrics and gynecology, reproductive endocrinology and infertility was really starting to explode, essentially it coincided with the development of in vitro fertilization technologies. Prior to this, we had very limited options in terms of what we could do to help couples dealing with infertility. It was a very exciting field because of the new technologies that were being developed and I wanted to be a part of that. So in 1989, I became an assistant professor at the Mount Sinai School of Medicine, which had one of the most active in vitro fertilization programs in the country.

**LL: What does the in vitro process mean?**

**Dr. S:** In vitro implies that the actual fertilization process does not occur in vivo, but occurs in vitro, meaning that the fertilization process occurs outside of the body. To achieve this, we prepare the patient by providing medications that will produce multiple eggs and the reason is that the technique is not 100 percent efficient, so we stimulate to ensure that the eggs will be produced. We then take the eggs out using an ultrasound machine that

helps us aspirate; it is not a surgical procedure; it is an ultrasound-guided aspiration procedure where we can take the eggs so we can put them together with sperms to achieve fertilization. We then let the embryos grow in vitro, which means in a cultured system that mimics what happens inside the body, and once ready, we place the embryo back into the uterus. What you achieve with this technology is you bypass what is supposed to occur in the fallopian tubes: In normal fertilization the egg and the sperm meet in the fallopian tubes and then the embryo has to travel down the fallopian tube until it gets back into the uterus. So you bypass this process.

**LL: When was this technique first developed?**

**Dr. S:** The big developments started about 30 years ago culminating with the birth of Louise Brown, the first in vitro baby, in England in 1978. This was the result of studies done by Robert G. Edwards, an English biologist who, with a physician colleague, Dr. Patrick Steptoe, developed the in vitro fertilization procedure for treating human infertility. Robert G. Edwards was just awarded the Nobel Prize for medicine because of his work in in vitro fertilization; so to this day his discoveries are extremely relevant. At first, the technology was developed for patients with non-functioning fallopian tubes, for whom surgery was ineffective, but eventually it was used to treat sperm factor infertility, problems with ovulation and any other cases where conventional therapy would not work.

The first in vitro baby in America was the product of Dr. Howard Jones and his wife Dr. Georgeanna S. Jones who, in 1981, helped give birth to Elizabeth Carr. Since then, we have taken major strides where we now have the ability to culture embryos in a better way and are much more successful now than we used to be by improving culture media conditions, the environment where the embryos grow. This is one of the specialties in medicine where we have had some of the most significant strides in technology in the last 20 years. Pregnancy rates have tripled compared to what we had in the late 80's, and we are able to treat a greater spectrum of patients. Today, we estimate that 2 percent of the babies born in the US are born in vitro.

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Story by Mariana Gutierrez Briones  
Photos for Latino Leaders by Matt Caton



**LL:** What have been some of the major breakthroughs in this technology?

**Dr. S:** Besides our ability to improve our culture systems and enhance embryonic growth so we can transfer to our patients better embryos and improve pregnancy rates, a major development occurred in the mid 90's where we started to develop micro fertilization techniques. That means that we gained the ability to be able to fertilize eggs with poor sperm quality and quantity because about one-third of the patients that we treat are cases where the male sperm is the problem. In the past, we could not do much about this, but we now have micromanipulators that allow us to take individual sperm cells and inject them into the egg and achieve fertilization. This technique is called IntraCytoplasmic Sperm Injection or ICSI, and it was the culmination of many years of research. The result is that some of the most difficult cases of infertility, which were due to severe male factor where the sperm was deficient, are now the easiest cases to treat because of this technology.

Another major breakthrough is that we now have the ability to conduct preimplantation genetic diagnosis or screening, which is called PGS. Because we can grow embryos in the lab we now have the ability to remove a single cell from an embryo, basically we do an embryo biopsy and analyze the DNA of that cell. That gives us the opportunity to detect abnormal genetic conditions before the egg is implanted. In older patients, it is important to analyze embryos because with advanced reproductive age, the eggs can be abnormal, and now we can test whether these abnormalities are present in the embryos. We can also determine gender so couples that are looking for sex selection can test their embryos to see if they carry the xx or xy genetic composition.

**LL:** What about other abnormalities like Down syndrome? Can those be detected as well?

**Dr. S:** With these technologies Down syndrome can also be diagnosed, particularly with some of the most advanced techniques looking at the karyotype, the chromosomal composition of that embryo. Analyzing every chromosome, we can establish if they have extra chromosomes or missing chromosomes so you can rule out the possibility of the patient having Down syndrome or other abnormalities.

**LL:** There is some controversy as to how much we can manipulate these embryos. To what point will we be able to determine what we want in a baby?

**Dr. S:** We don't have the ability to make designer babies if that is what you are referring to. We are not close to that. We don't have the technology, and I don't think there is much research heading in that direction. It is about creating healthy babies, not about selecting eye color or height. Gender selection is important for patients that carry certain genetic mutations that can affect an embryo of a certain gender, and that is primarily why this technology is available. So it's about the health of the embryo; designer babies are not in our near future.

**LL:** What other controversies surround these methods?

**Dr. S:** From the Catholic viewpoint, life starts after fertilization, so to them IVF should not be allowed. In some countries, these technologies have been prohibited or very strictly regulated: It is allowed limiting the number of eggs that you can fertilize. In Europe, there is more regulation, but not in the context of religious beliefs, but because of the rules imposed due to their nationalized healthcare. Some Scandinavian countries, for example, limit the transfer to a single embryo. But we strongly believe that it is the right of every human being to experience parenting if they wish to do so.

**LL:** Many of these treatments result in multiple pregnancies. Is there a way to avoid this when a patient only wants one child?

**Dr. S:** Human reproduction is not perfect, not every egg and not every embryo is going to create a healthy newborn. We have a significant amount of reproductive wastage. A woman is born with two million eggs, by the time she starts the menstrual cycle at 11 or 12, she has gone from two million to three hundred thousand eggs. So you start your reproductive cycle with 300,000, but every month you lose about 500 to 1000 eggs. So the amount of eggs over time diminishes significantly. As we get older, the proportion of abnormal eggs also begins to rise. So that clearly impacts fertility. Based on that we understand that not every embryo we create will be normal or give us a live birth. Therefore, most of the research is geared to determine in non-invasive ways which are the embryos that can create a healthy birth.

One of the main purposes of this technology is to try to limit the number of em-

bryos transferred. Every patient responds differently and has a different number of embryos that they produce. Typically we transfer two embryos to prevent multiple pregnancies. It is true that one of the consequences of these technologies is that the number of twins has risen 25 percent among IVF births. So all the specialists are working to limit multiple pregnancies. There are, of course, cases like the Octomom where it is the result of a major malpractice. And some multiple pregnancies are the result of ovulation inductions where there is no control over the eggs that are produced, but is it not necessarily related to IVF. But it is something that the medical community is addressing, and huge leaps have been made to be able to select and determine which is the embryo that will result in a successful pregnancy, so that we can limit the number of embryos transferred and still give a high probability of a healthy pregnancy.

**LL: What is the average number of embryos produced per cycle?**

**Dr. S:** There is an average of 10 to 12 eggs that are produced, with a 60 percent fertilization rate that means about six embryos per cycle. Once embryos have been successfully implanted, the rest can be preserved for later use. We have been very successful with freezing of embryos for a long period of time. So when patients do a cycle of IVF they can have embryos preserved for later use.

**LL: What other technologies have proven successful in aiding with pregnancy options?**

**Dr. S:** Egg cryopreservation or the freezing of human eggs was something very difficult to do until very recently. We have had the technologies to freeze embryos for a long time, but this is a new technology. The freezing of eggs was extremely difficult because of the crystallizing of water molecules that tend to fracture the egg, so it was a huge challenge for scientists in this field to achieve safe cryopreservation. It is very relevant from the clinical standpoint, because we have a lot of patients that are diagnosed with malignancies or medical conditions that will require chemotherapy, or other therapies where their eggs are going to be lost, so this gives us the opportunity to be able to preserve their fertility by taking out some eggs to be used at a later stage. This technology is also being used as fertility preservation for patients who are moving to the later parts of the reproductive spectrum but who are not ready to become pregnant, but are thinking of pregnancy in the future. So now we can freeze some of the eggs so when the right time comes they have the opportunity to conceive. Two-thousand babies have been born with this technology.

**LL: How have these technologies changed families? Are people now waiting longer to procreate?**

**Dr. S:** The socioeconomic pattern has changed; we live in a society where we are thinking about having children later in life. Both men and women are engaged as an active part of society, they have professional goals, personal goals. But the way we are designed is to have children very early in life. We are

physiologically designed to procreate in our late teens or early 20s. That of course does not engage properly with the present lifestyle. So these technologies have been very helpful for those patients who want to fulfill their dreams of having a baby later in life.

Even patients who have passed their reproductive spectrum at 43 or 44, we can help them get pregnant with donor eggs that can lead to healthy embryos giving patients the opportunity to experience parenting regardless of age. The median age of our patients is now 38. Same sex couples have also benefited a lot from these options, which give them the opportunity to form their own families.

**LL: Are these procedures very costly?**

**Dr. S:** A cycle of in vitro involves a lot of steps: multiple ultrasounds, blood testing, sedation, sophisticated lab work, engineering needs in the lab, pressurization of the air... it is an expensive technology. But all that being said, when we know what is involved in maintaining high quality fertilization labs, it is not that expensive. Surgery of the fallopian tubes, which is not that effective, will cost about \$20,000; it is twice as expensive as a fertilization cycle which costs an average of \$10,000. So it is expensive because there is so much of an effort involved in each of these processes, but many of the major insurance companies cover fertilization procedures, which make them accessible to a wider range of patients.

**LL: What has surprised you the most while working in this field?**

**Dr. S:** One of the things that I have learned is that when couples are ready to have a child, they are extremely dedicated. I am always surprised at how important this becomes to them, and how hard they work at achieving success. Persistence and human desire is something that I have learned is a very strong human feature when it comes to reproduction. It is incredible to see how they can overcome all challenges until they achieve a healthy baby.

**LL: What has been the greatest reward of your career?**

**Dr. S:** The biggest thrill in my professional life has been to work with patients with a bad initial diagnosis and knowing that they have really good chances of conceiving, which is very different from when I started where the pregnancy rates were 15 or 20 percent. We are now at 60 percent to 70 percent per cycle. That is the biggest satisfaction, to sit with my patients and realistically offer the possibility of being a part of this important dream of theirs and being able to deliver the results.

It is a very exciting specialty. We are surrounded with life, and we deal with life on a day-to-day basis, as opposed to dealing with patients who are terminal or have diseases. We are treating patients who have challenges with what is one of the major rights of humanity, which is to procreate, and it is immensely rewarding to see our patients achieve success and help couples form their families instead of death or disease. We deal with helping people achieve their dreams. ●

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