The Modern Family

My parents got married later in life. They were the kind of people who had wanted to experience the world before marrying and starting a family so that when the time came to raise children of their own, they would be able to look back on their lives with no regrets or longing to do something they no longer could. But, by the time they were 40, marriage and kids were things they both wanted desperately. In fact, the most important question my mom asked my dad on their first date was that if he wanted kids too. They'd spent the first chapter of their lives taking on the world as individuals, but they were ready to move on to the next as part of a family.

For both my mom and dad, becoming parents was something they had dreamed of their entire lives. Unfortunately, they had to face the ugly truth that becoming pregnant at the age of 44 was not going to be easy. After many unsuccessful attempts to conceive on their own, my parents finally turned to science and the growing field of assisted reproductive technology. After four separate rounds of failed in vitro fertilization, my twin brother and I were finally conceived. To this day, my parents still feel an indescribable amount of joy thanks to the power of reproductive technology. As I grew older, I truly began to appreciate the amazing capability of in vitro fertilization to create embryos outside of the human body when parents are unable to conceive on their own because of infertility, genetic disorders, or other factors. Thanks to this technology, 200,000 "test-tube babies" have been born since 1978, with many more inevitably to come in the future.

The process of in vitro fertilization begins with the utilization of fertility supplements taken by the mother to stimulate the development of multiple mature eggs within the follicles of the ovaries. Follicle-stimulating hormone (FSH) and Human chorionic gonadotropin (HCG) are two such drugs used to aid in this process, as success rates of fertilization are very low when there are less than three mature follicles. Each follicle contains a microscopic egg, and

its maturity can be determined with high-powered ultrasound technology (such as the GE Voluson E8) that measures its diameter. Mature eggs are then removed from the pelvic cavity with a hollow needle and manually combined with a sperm sample in a laboratory dish. In some cases, intracytoplasmic sperm injection (ICSI) is used to ease the process of fertilization. Here, a needle is used to immobilize and pick up a single sperm and inject it into the cytoplasm of an egg. An inverted microscope is used to enable the examination of the eggs at the bottom of the culture dishes and make the performance of ICSI easier. The embryos are then kept incubators that maintain a constant 37 degree Centigrade temperature.

The last procedure of in vitro fertilization is the transfer of the egg from the laboratory dish to the uterus. It is necessary that the physician places the embryos in the middle of the endometrial cavity without destroying it in order for the entire fertilization to be successful. Ultrasound guided embryo transfer is currently the most effective method for insuring the safety of the fertilized eggs. An embryo transfer catheter is filled with the embryos and passed into the endometrial lining of the uterus, the optimal location for embryo placement. In most cases, multiple embryos are transferred in order to increase the chances of implementation into the uterus. Furthermore, the national success rate for live births as a result of in vitro fertilization was 43% in 2014. This means that in many cases, parents desperate for children will undergo the procedure more than once. Unfortunately, the high cost of the procedure inhibits many infertile parents from being able to undergo it. Many couples are not able to pay the $12,000 that many IVF clinics charge. However, like everything else in science, IVF is always advancing and new technology is likely to make the procedure even more efficient and successful in the future. It is a wonderful alternative to natural conception for parents unable to conceive children on their own, such as my parents.

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