

OTTAWA SCIENCE INNOVATION CHALLENGE 2021/22



Ottawa Science Innovation Challenge

Acknowledgements

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REPRODUCTIVE HEALTH AND FERTILITY

Case Study 1

FAMILY SACRIFICE

Amanda squeezes Oliver's hand tight.

"Do you think we really have a chance?" she asks worriedly.



"It can't hurt to try!" he replies, trying to cheer her up.

The couple is waiting in the fertility clinic, for what it seems like the hundredth time.

It has been 7 painful years since their journey to expand their family began. They initially tried on their own for two years with no results. After going to the doctor, they realized that the medical definition of infertility is only one year of unprotected sex without pregnancy, which was a shock to the couple who thought this condition was rare.

They are not the only ones who think this way. The problem of infertility is increasingly common, with the latest statistics showing 48 million couples and 186 million individuals live with infertility around the world, or approximately 1 in 6 who try to get pregnant.



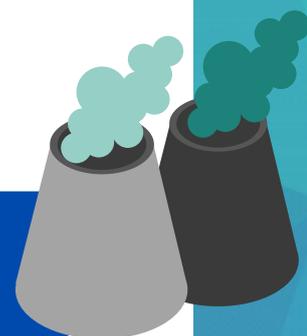
The two met in highschool, and moved out together as soon as they could. Oliver supported her with his job at a factory, where he worked long hours every day surrounded by chemicals and air pollutants.

The first visit with the physician, she told them:

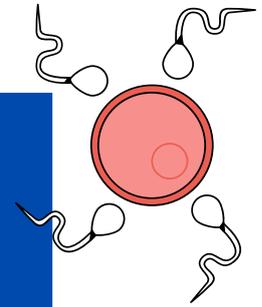
“The lab analysed your semen sample, and the results show low motility and concentration. In other words, there are very few sperm cells and they have trouble reaching the egg. After what you were telling me about your job, I think it is highly likely the cause is environmental. The toxic chemicals and unclean air can actually have a big impact on fertility.”



“Wow, I had no idea!” Oliver exclaimed.



“Yes, in fact more and more research is being done on this. Many scientists believe it is behind the 30% of unexplained fertility, and it has been significantly increasing with the industrialization of the world.”



*“So what should we do now?”
asked Amanda.*

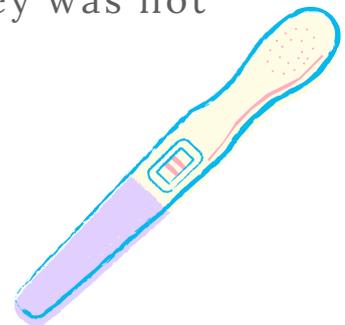
“Well, we also found that you have difficulty ovulating, which is a pretty common cause of infertility. I think the first step would be to try medication to help, so I will prescribe you with Clomid and I will continue to check on you regularly.”

“Will we have good chances of getting a baby with this medication?”

“Nothing is ever certain, but it has pretty reliable success rates. If it doesn't, there are still many options we can consider. At least it is not uterine or hormonal diseases, or even anatomical issues that would require surgery.”

After 6 months of no success with the medication, the doctor told them it was very unlikely they would ever get results, so she recommended they try IUI. The couple was dreading this, because of the associated costs. Most assisted reproduction techniques are extremely inaccessible to the majority of the population.

Luckily, on their second round, the pregnancy test came back positive! The good news alleviated a lot of stress in the couple's life, but their journey was not over yet.



The baby was closely monitored to make sure its development was normal. 25 weeks into the pregnancy, the doctor discovers the fetus has a rare chromosomal abnormality that would not allow the baby to live for more than a month, and they would be lucky to have a week.

This devastating news, coupled with the physical trauma Amanda would have to undergo with the abortion severely affected the couple's relationship. Not only were they struggling financially, they were spiraling in feelings of control loss, guilt, isolation, and shame.

A couple years pass, and the couple has had time to regain a handle on their life and relationship, and they decide they really want to try again before it is too late.

The doctor finally comes into the waiting area.

"Amanda and Oliver?"

"Yes! We're here!"

“Hello! I haven't seen you in a long time! How are you doing?”

“Hi! We're doing better! We are back because we really want to try again”

“That's good to hear! I will do my best to help you, but you can't get your hopes up, you know that your case is pretty complicated.”

After examining and testing both Amanda and Oliver, they are ready to discuss their options.

“Let's start with Amanda. I saw a lot of scar tissue in your abdomen and uterus, which is not a good sign. Combined with your age, the chances of insemination working again are very low, less than 14%. Also, Oliver's sperm concentration and motility has decreased since last time I saw you.”

“Are there any other options we can try?”

“The best option at this point would be in vitro fertilization (IVF), but there is still only a 25% success rate, and it might be hard financially and emotionally on both of you.”



Amanda looks at Oliver with a very disappointed look. She was expecting bad results, but hearing the doctor say it makes it real. She will never be able to have her own baby.



Case Study 2

AN AWKWARD EDUCATION

The school bell rings as Emma reluctantly takes her seat in Health class. Her teacher begins greeting the students and Emma looks down at her phone, mentally preparing herself for the next uncomfortable hour she will spend listening to her teacher talk about STDs and contraceptives.

“Hello everyone! I hope you’ve had a good weekend,” greeted their teacher. “Today we will be learning something new. We will be discussing a topic not many of you are familiar with: chronic reproductive health issues.”

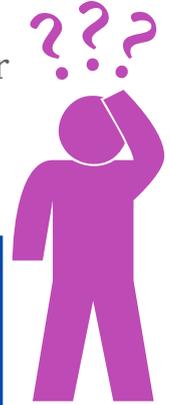
Emma raises her hand confused by the topic of the day’s lesson.



“Didn’t we already do this last week when we went over STDs?” she said.

“Partially. It is true that STDs are reproductive disorders, but it is important to note that there are many reproductive health problems that are not sexually transmitted,” replied the teacher.

Emma and the rest of her class look at their teacher with confused expressions.



“Although rarely talked about in Health class, they are very common. For instance, in Canada, around 7% of women are diagnosed with endometriosis.”

“What is endometriosis? I’ve never heard of it,” asked Julie, Emma’s classmate.

“Well, endometriosis is a condition where uterine tissue is found outside the uterus such as the ovaries, the fallopian tubes and even the bladder, among others. This tissue follows the same menstrual cycle as the tissue found in the uterus which leads to intense pain during the menstrual cycle, a heavy menstrual flow and even infertility.”



*“That sounds horrible,” said Emma,
“How does someone get it?”*

*“There is still no known cause for the condition
and it is also very difficult for some women to
receive a diagnosis, sometimes even taking years
before receiving a definite answer.”*

*“What’s even the point of us being in this class?”
asked one of the boys at the back of the room, “We
don’t even need to be here. This is only for the girls
anyways.”*



“That’s where you’re wrong, Alex,” responded the teacher, “Although men are often excluded in discussions about all aspects of reproductive health, they too are affected by it. Around 30 million males suffer from erectile dysfunction, a condition which sees men struggling to obtain an erection. It can result from a number of health issues and is even a precursor to more serious and potentially deadly conditions such as heart disease.”

The teacher pauses and looks out to her students before continuing.

“Aside from physical effects, erectile dysfunction can also lead to depression, a lack of self esteem, and insecurity in relationships.”

The room is quiet for a few seconds, then the bell rings.

As Emma packs up her things and walks out the door she reflects on the information she has just learnt and thinks to herself, “I was not expecting to hear that today. Why is this the first I am hearing of chronic reproductive health issues? Should I be worried?”.

