

# Fred and Marjorie: A Dog and The Discovery of Insulin

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Characters (17):

Narrator 1, Narrator 2, Fred (Dr. Banting), Nurse, Doctor 1, Father of diabetic girl, Doctor 2, Citizen 1, Citizen 2, Boy, Girl, Doctor 3, Professor, Professor MacLeod, Charley, Margaret, Henry

Scene 1:

Narrator 1: The Hospital for sick children, Toronto, Canada-1920

Dr. Banting: Phew!

Nurse: That was a long surgery, Dr. Banting. Why don't you take a break?

Dr. Banting: Your daughter has diabetes. There's no cure.

Father of diabetic girl: How long does she have, Doc?

Dr. Banting: A few months. Maybe a year. I'm very sorry.

Scene 2:

Doctor 1: Morning Fred. I think I've been working too long. All I can see are giant balls of cotton.

Fred: All I see are animals. Look, there's a horse, grazing cow, A sheet, A cat.

Dog: Woof!

Doctor 1: That mutt looks as shabby as I feel.

Fred: Hello, pup.

Doctor 1: Don't encourage it!

Fred: You hungry?

Dr 1: Humph. You'll never get rid of that money  
Beggar now!

Fred: It's hard going in there. I wish I could spend the  
rest of the day outside with you.

Narrator 1: But Fred had to go back to work. There  
were dozens of young patients who needed his  
care. He wanted to help them all, but his job at  
the hospital was temporary, and new patients  
were admitted every day. Some of the worst off  
suffered from a fatal disease called juvenile  
diabetes.

Narrator 2: In 1920, doctors knew that diabetes prevented a  
body from breaking down sugar. They'd also  
discovered that the disease had something to do  
with a part of the digestive system called the  
pancreas, but they didn't yet understand how.

Narrator 1: One thing they did know was that diabetes was a  
death sentence, and once diagnosed, the illness  
moved quickly, sometimes called the  
wasting-away disease. Diabetes had only one  
treatment: Starvation.

Narrator 2: There had to be a better way to help kids with  
diabetes. But no doctor had been able to find  
the answer.

Scene 3:

Citizen 1: Beat it, mutt!

Citizen 2: Hey! Shoo!

Boy: Hiya, dog!

Girl: Are you okay?

Boy: I'm fine.

Boy (talking to dog): I gotta go. Go on, dog. Go back to where you belong.

Narrator 1: But this stray pup didn't have a home. She belonged to no one but herself.

Narrator 2: Weeks later, Fred's residency at the children's hospital came to an end.

Fred: What am I going to do now?

Narrator 1: Fred borrowed some money, packed his bags, and left Toronto in hopes of starting a small medical practice.

Scene 4:

Fred: Doesn't anyone in this city need a doctor?... Maybe I should have chosen a different profession.

Fred: Excuse me... I was wondering if you have any teaching positions available? I...I'm trained in surgery.

Professor: I'm sorry, but the new semester has already begun.

Fred: Please, sir... I really want to be of use! I'll take anything you have to offer.

Soon After...

**Fred:** Good morning. My name is Dr. Banting. I'll be working here part-time as your new instructor in anatomy and surgery.

**Narrator 1:** Fred's time in Toronto was beginning to seem like a distant memory. But he never forgot those long, hard days at the children's hospital.

**Narrator 2:** A few weeks after starting his new job, Fred was asked to prepare a lesson for his students about the pancreas- a subject he knew almost nothing about. He stayed up for hours reading.

**Fred:** I think I've got it!

**Narrator 2:** Diabetes ligates pancreatic ducts.... Keep dogs alive by leaving islets.... Isolate the internal secretion.

**Narrator 1:** Acting on the advice of professor Miller, Fred went to the University of Toronto to discuss his idea with a professor of physiology.

**Fred:** I've had the most exciting idea, sir! Treatment for

diabetes!

Professor MacLeod: Slow down. What are you talking about?

Fred: We know something is produced inside the pancreas that controls the body's sugar... right? Well, I think I know a way to find it! ..... First, we remove the pancreas from a dog, making the animal diabetic. Then we extract this substance and inject it into our diabetic dog to relieve his symptoms. Do you see?

Professor: Dr. Banting, you're an orthopedic surgeon. You have no practical experience with research. Or with diabetes, for that matter.

Fred: But I've read up on this disease, and I think this experiment can work. I need your help.

Professor: How?

Fred: A space to work. And some funding. And a team of dogs for the research. I'd like to start right away.

Professor: It's a big job. You have to wait for the school year to end so I can get you a lab. And you need an assistant.

Fred: Thank you, sir, I won't let you down.

Scene 5:

Professor: Either of you lads interested in a summer research job?

Assistant: Yes, please!

Charley Best: I am, sir!

Narrator 2: the professor then flips a coin to decide who will assist Fred.

Professor: Lucky you, Charley Best!

Narrator 1: May 1921...

Professor: I'll have someone bring the dogs up and get you started. You'll have the lab for the summer.

Charley (thought): Is it too late to change my mind?

Professor: Once you two are set, I'll be off to Scotland for the holidays. I expect you to keep me posted on your findings!

Charley: He's leaving us?

Fred: It's fine. We've got this.

Scene 6:

Narrator 1: They quickly go to work with the first group of dogs.

Charley: Is that the little fellow's name?

Fred: They're not pets. They're lab animals. Researchers should never let themselves get emotionally attached. Don't you agree, Dr. Banting?

Charley: Yes, you're right. Very wise.

Narrator 2: But Fred couldn't help himself.

Charley: You're good with all the dogs. They all seem so at ease with you.

Fred: I grew up on a farm. I've always loved animals.

Narrator 1: But conditions in the dingy lab were a problem. Many of the animals died from infections. Others didn't survive the surgeries.

Charley: What do we do now?

Fred: We're just going to have to get more dogs.

Narrator 2: Long days in the lab stretched into weeks. In July, Fred and Charley had a breakthrough. They managed to isolate a small amount of the mysterious internal secretion from a dog's pancreas. They called it islets.

Narrator 1: Nervously, they tried giving it to one of their diabetic dogs.

Fred: Cross your fingers, Charley!

Fred: Hurrah!

Charley: Yes!

Narrator 2: The islets seemed to be working! But not as well as they'd hoped, and it was taking far too long to produce. Fred and Charley were on the right track, but there was much more work to be done.

Fred: Dear Professor MacLeod, I have so much to tell you...

Scene 7:

Narrator 1: While Charley took some days off to travel and visit family, Fred stayed in the lab. He was determined to prove this treatment for diabetes would one day work on humans. But it was already August. Professor MacLeod would be back in a few weeks. Time was running out.

Narrator 2: Fred worked around the clock. Fred barely left the lab these days except to run back to the boarding house where he was staying to bathe and change his clothes.

Fred: Just one, please.

Fred: Time to go home now, pup.

Fred: You don't have a home, do you?

Fred: I'm sorry. I can't offer you anything. I've barely enough money to feed myself.

Fred: There's food up in the lab. It's for the dogs on our team. I won't tell you it's a good deal... But we're working to find a treatment that will save dying children around the world.

Fred: I've brought a new helper with me. I'd like to name this one. She looks like a Marjorie.

Charley: I'll call her Dog 33.

Scene 8:  
Narrator 1: Temperatures in the city soared that summer. Charley's fiancée, Margaret, and her brother, Henry, visited the lab in August.

Henry: It's an oven in here.

Margaret: And it stinks. How can you work like this?

Margaret: Come on, darling. Time for a bit of fresh air.

Charley: Will you join us, Dr. Banting?

Fred: Just getting the dogs. They need fresh air, too.

Fred: Would you mind taking some photos?

Henry: Sure. Of you and Charley?

Fred: And the dogs, too, of course.

Henry: Say cheese!



Fred: Now, some photos of just the pups.

Fred: Marjorie's turn. That's a good girl.

Margaret: Why so many photos of the mutts?

Fred: These dogs are heroes. I want them to be remembered. Their role in this research is just as important as ours. In some ways, maybe more so...

Scene 9:

Narrator 2: On August 31, another one of their lab dogs died—a collie known only as dog 92. She had been a sweet dog, and her loss was especially heartbreaking for Fred.

Charley: I know this is hard. But we have to carry on. Think of all the lives we might—

Fred: I—I need to be alone right now!

Fred: I'll never forget that dog as long as I live.

Narrator 1: Dog 92 didn't die in vain. Sustained by injections of islets, she'd survived an incredible twenty days without a pancreas. It was by far the longest of any diabetic dog so far. Fred and Charley were getting closer and closer to refining a version of their extract... one they hoped would be safe enough to try on humans.

Scene 6:

Narrator 2: When Professor MacLeod returned from holidays, he was encouraged by the team's work.

Professor: Hmm...

Professor: Very interesting. I'm willing to give you more time to keep the research going.

Charley: Yes!  
Fred: And salaries for the both of us. We can't go on without getting paid.

Professor: All right. Fine. But there's one more thing. Isleton is too hard to pronounce. I think this extract should be called insulin.

Scene 7:

Narrator 1: Over the next few months, Fred and Charley continued to refine their extract while at the same time looking for better ways to produce it. Fred had the idea of salvaging cow pancreases from slaughterhouses. The organs were easy to find and using them spared some of their dogs from surgery.

Narrator 2: In November, they presented the results of their research at the journal club of the University of Toronto Department of Physiology.

Fred: We're here today to tell you about our exciting new discovery...

Narrator 1: News of their research buzzed throughout the medical community. People were hopeful but skeptical. They wanted more proof that this was really the breakthrough Fred and Charley claimed it to be.

Professor: I suggest you two conduct a longevity experiment. To prove how long you can actually keep a dog alive.

Scene 8:

Narrator 2: On November 18, the experiment began. It was the final and most important test of Fred and Charley's work. Fred chose Marjorie for the job.

Fred: You're gonna convince all the doubters, Marjorie.

Narrator 1: A few days later...

Fred: That's my brave little girl.

Narrator 2: Days passed while they waited for the now-diabetic Marjorie to prove their extract worked. Working eagerly to push forward, Fred decided to inject himself with it too.

Fred: To show the world it's not toxic for humans. In case I'm wrong, please make sure my parents get this. It's an apology... should things go badly.

Narrator 1: Luckily for Fred, there were no ill effects. But Professor MacLeod wasn't impressed.

Professor: That's not reliable enough proof. I'm going to invite James Coolio to join our team. He's a biochemist and much more qualified than you to do the work of purifying the extract for humans.

Narrator 2: With her daily injections of the extract, Marjorie stayed healthy and strong all through December. While the rest of the team went home to spend the holidays with their families, Fred and Marjorie celebrated Christmas together in the lab.

Fred: Merry Christmas, Marjorie.

Scene 9:

Narrator 1: Nearing the end of January 1922, Marjorie survived for almost seventy days without a pancreas. In Fred's opinion, it was the proof the medical world had asked for.

Narrator 2: It was now time to try their extract on a human patient.

**Narrator 1:** But there wasn't enough supply to keep a stray dog alive any longer. It was important to use what little they had for a child with diabetes.

**Narrator 2:** Marjorie's work was done.

**Charley:** She was a brave and generous dog.

**Fred:** I'm sorry I couldn't offer you anything better. But one day, the children you helped to save will hear your story and know your name.

**Narrator 1:** Toronto Western Hospital, January 23rd, 1922. Leonard Thompson was fourteen years old and weighed just sixty-five pounds. He was drifting in and out of a diabetic coma when he received his first injection of the newly purified insulin.

**Narrator 2:** The effects were practically miraculous. Leonard began to improve almost immediately.

**Narrator 1:** Eager to put insulin into the hands of ailing patients as soon as possible, the team sold their rights to the life-saving treatment to the University of Toronto for one dollar each. As Fred famously said: "Insulin does not belong to me. It belongs to the world."