

## Tomorrow's Hospital Curing Etienne's Leukemia

Noémie, a 7-year-old-girl, and her mom have just reached the main entrance of this brand-new hospital for Regenerative Medicine. Etienne, a 10-year-old-boy, has been staying in this hospital for four days. Crossing the hall, mother and daughter find the reception desk, talk to a receptionist. "Just follow this robot," she says, handing out the new hospital brochure for them. "It will show you the way to Etienne's room." As the robot is moving along, mother and daughter are walking hand in hand. Mom wants to tell Noémie about some very intense moments: when Etienne, Noémie's older brother, was born.

- You and your brother were born at the same maternity hospital. Once Etienne was born, the midwives kept the placenta. Placenta is like baby food, baby cereal. As long as he is staying inside his mother's womb, the baby feeds from the placenta.

- Why did the Midwives do that? I mean, keeping the placenta?

- This placenta was like leftover baby food. The midwives took this food, as well as Etienne's birth cord, and stored both in a special place. Once the baby is born, a midwife has to cut the birth cord. So, you know, the midwives just took Etienne's leftover food and his cord and...

- But where did they put it all? I mean Etienne's birth cord and the baby food?

- They didn't keep all of it. They just needed to extract blood from it, that is: blood from the placenta, and blood from the birth cord. Not lots of blood, just a little ... And then, they stored this blood in a special fridge, or freezer if you prefer, where it can stay for a very, very long time.

- And what about you? Where were you when this all happened?

- Just lying in my bed. And lying on my tummy, with his legs folded behind him like a little frog, was Baby Etienne! I simply hugged him as tight as I could. I was beside myself with joy.

- What does that mean?

- I was filled with joy ... and love! It all happened again when you were born: I was beside myself with joy and love, just the same! And now, we need to cure Etienne's Leukemia. And to cure him, we need to get the cord blood from the special freezer, where it has been stored for 10 years! This treasure is what will cure your brother.

Noémie greeted her brother with a big smile and an enthusiastic « Hi big boy! ». Etienne just hated it when mom was talking to him like that, and Noémie was very well aware of it. A nurse joined in soon afterwards. The robot had just informed her about the new arrivals.

- "Everything's just fine," said the nurse. Mom and the nurse were exchanging a few words, that's all they could do, because Noémie had just launched into a story filled with midwives, treasures and mothers beside themselves with joy.

- "How about some hot chocolate milk?" asked the nurse, turning her attention to Noémie.

Mother and son are sitting together now. Browsing through the new hospital brochure, they read about cord blood, and its ability to cure Leukemia. How can cord blood just make it happen? Etienne wants to know everything about it. He and his mom try to find out more about the process of curing Leukemia in this brand-new hospital for Regenerative Medicine.

- You were born in a cutting-edge maternity hospital, pioneer in cord blood, which means this maternity hospital you were born at worked with the very first cord blood bank ever.

- Banking cord blood and placenta blood instead of money! It certainly sounded challenging at first, didn't it?
- Well, this special blood bank was dedicated to collecting birth cord and placenta blood to cure serious diseases like Leukemia, not to become rich!
- But how is this special blood bank working? And to start with, how did it work when I was born?
- This pioneer blood bank used to store the blood the midwives collected from birth cord and placenta every time a baby was born. Now, how does this work? Immediately after a baby is born, the cord and placenta continue to supply it. But then, after the baby is born, the umbilical cord is cut and the end remaining with the baby is clamped. The midwives take the cord away, and they can extract a small amount of blood from this cord. Now, this small amount of blood contains a lot of stem cells that can cure your Leukemia. Back then, when you were born, every mom in that maternity hospital you were born at could decide to donate some cord blood for the blood bank.
- What about the placenta?
- The placenta is expelled after the baby as the "afterbirth". The midwives can also store the blood they get from it.
- Because of the stem cells it contains!
- Exactly!
- So you decided to donate some cord and placenta blood for the bank! Were the moms reluctant to donate this blood? I mean, did this hurt?
- No, not at all! All mothers were willing to donate.
- Did the midwives tell you this blood could cure Leukemia?
- No, because, back then, nobody knew!

- Wow! So... this bank existed, though nobody had any idea the cord and placenta blood could cure Leukemia!

- That's right! Later, scientists established that blood diseases, like Leukemia, could be cured with the help of cord blood that could also be very helpful in the process of regenerating organs – like the liver. This hospital you are staying in specializes in regenerative medicine, that is: how is it possible to regenerate skin, blood and organs?

- So this is the reason why I'm staying in this hospital.

- Not the only reason, though. Curing your Leukemia also meant: getting back that cord blood I had donated after your birth. That's why this hospital is exactly the right place for you, my sweetie pie!

- I know how they did it! All the hospital had to do was call the blood bank, which is located right in this hospital. The nurses took me there the other day.

- Good ! And, you know, daddy's tool box ...

- I know! , interrupted Etienne. Sam, the nurse, already told me. Everybody has their own tool box. Each and every baby does. Each birth means: one tool box! The blood bank just stores them. Each mum donating the new born baby's cord blood is like a parent opening a bank account for their child. But instead of putting money in this bank account, they will put the new born baby's "tool box", which can be stored for a very, very long time. Just in case it can help, one day ... I've just used the instruments in my own tool box, that is: the doctor used them for me. These instruments are stem cells. "Umbilical cord blood derived stem cells", the doctor said. They can cure Leukemia.

- And regenerate – or help regenerate – organs too. And ... Check this out!  
“Regenerating organs has revolutionized transplant medicine. Transplant patients, instead of waiting years for a donated organ ...”

- Yes, it means organ transplantations are less frequent than they used to be! What happened is that a lot of people died waiting for a transplant ...

- So they died before a transplant could be found ... What a sorry story!

- And transplants didn't work wonders for everybody! It reads: “Acute graft rejection, or infection, could cause the death after transplantation!”

- Transplanted men, women or children had to take a treatment for their lifetime. Actually, loads of pills! And this treatment could trigger cancer, or other serious diseases, but they needed it, because otherwise they could die ...

- Because of acute graft rejection! “Immunosuppressive agents are drugs that inhibit or prevent activity of the immune system. They are used in immunosuppressive therapy to prevent the rejection of transplanted organs and tissues.” It was so damn complicated!

- Watch your language, young man! And I am half not kidding here.

This gave both the giggles.

- Different types of organs in the human body have been regenerated using stem cells. Definitely a better way! Organ shortage, acute graft rejection, infection, immunosuppressive agents, of course it is best if you can forget about it all!

“Such a smart little boy!” thought mom, observing her son. Thank God Etienne would never look like those leukemic children from the past: big eyes in a thin face with pale ivory skin, so weak that they could hardly move.

- The brochure reminds us that stem cells can neither eradicate cancer, nor clone people! Well, I didn't know that. But I knew about organ transplant history. The Doctor had already told me.

- Well, I didn't know doctors could be so talkative! Anyway ... This tool box is simply magic. My son's Leukemia is gone!!!

Mon gave her son a big hug. Etienne was thoughtful. What if he were born in another maternity hospital?

- Mom, what about Noémie? Does she have ...

- Her own tool box too? Yes, she does!

- Mom, do you think we will ever be able to eradicate cancer?

Etienne's mother answered that we may not be immortal and that the most important thing was the struggle – against cancer or AIDS, and, day after day, against each and every upcoming disease or epidemic.

Breastfeeding is the ultimate connection between mother and child. But this conversation, happening between mother and son, wasn't it like, well, a new ultimate connection?