

## Dr. Levy and Charmaine

**Dr. Levy:** [00:00:00] [00:00:00] MOT is a world first. This unit is unique. The establishment of an integrated, fully integrated multiorgan transplant program is a world first. This is a unique model and that's why people come from all over the world to see how, how do we do it. Watching young people suffer with no opportunity. There really was nowhere to go. No hope. And what we've done here, as everybody knows, is nothing short of a miracle.

[00:00:28] **Brittany:** [00:00:30] Welcome to Living Transplant.

[00:00:32] **Courtney:** [00:00:32] The podcast that takes you behind the scenes of the transplant program at Toronto General Hospital,

[00:00:37] **Brittany:** [00:00:37] and brings you open and honest conversations about the transplant experience.

[00:00:41] **Courtney:** [00:00:41] My name is Courtney and I'm the communication specialist for the Centre for Living Organ Donation.

[00:00:46] **Brittany:** [00:00:46] And my name is Brittany. I'm a bedside nurse in the Ajmera transplant center.

[00:00:50] **Courtney:** [00:00:50] Full disclosure: we are not physicians.

[00:00:52] **Brittany:** [00:00:52] No. And we are not here to give you medical advice.

[00:00:55] **Courtney:** [00:00:55] Think of us like your guides through the world of transplant, as we know it,

[00:00:58] **Brittany:** [00:00:58] Whether transplant is your [00:01:00] past present or future your passion or your curiosity,

[00:01:04] **Courtney:** [00:01:04] Living Transplant will show you the world of transplant like you've never seen it before.

[00:01:09]

[00:01:09] **Court:** [00:01:09] So there's no way that we could not do an episode about the history of the Multiorgan Transplant Program, which is now the Ajmera Transplant Centre and who better to talk to you than Charmaine Beale and Dr. Gary Levy.

[00:01:22] **Brit:** [00:01:22] So I call him the Dumbledore of transplant,

[00:01:24] **Court:** [00:01:24] which I support 100%. I'm really happy. We got to sit down and talk with them. This is my first time meeting Dr. Levy. But you had met him before, right Britt?

[00:01:34] **Brit:** [00:01:34] Yeah. I had met him on the floor. I had assisted him doing bedside liver biopsies, but this was my first time having an in depth talk about the transplant program with him. He literally built the program from ground up.

[00:01:47] **Court:** [00:01:47] Yeah. And after pioneering the GI transplant program, it became the Multiorgan Transplant Program literally hours after it had been announced.

[00:01:55] **Brit:** [00:01:55] Yeah. It's honestly really crazy to think about how hard [00:02:00] dr. Levy had to defend the transplant program. He went in front of the Ontario Medical Association and an old man literally told him this is a waste of time and money. It's insane to think that from then till now the amount of lives that have been saved because of it. Toronto General did 700 transplants that last year alone. And this has been going on for like 20 years plus.

[00:02:25] **Courtney:** [00:02:25] Yeah, it's crazy. And then to hear about the origins of the program, where it was just four beds in the Eaton wing, like it's crazy. And hearing Charmaine's perspective too was incredible. I had no idea what a long history she had with the program.

[00:02:38] **Brit:** [00:02:38] Absolutely. There would be no transplant program without Charmaine period. Dr. Levy needed her to get the program off the ground. One does not work without the other. He's no, she's the cash to the rubber band and the butter to the bread. You know, they're like together, they can't

[00:02:56] **Courtney:** [00:02:56] McGonagall to his Dumbledore,

[00:02:57] **Brit:** [00:02:57] McGonagall to the Dumbledore, [00:03:00] 1050% of 1050% for the millennials out there that understand the Harry Potter reference. Here's our interview with Dr. Levy and Charmaine Beale.

[00:03:11]

[00:03:11] ow did you get involved with transplant, Charmaine?

[00:03:19] **Charmaine:** [00:03:19] Well, I got involved with transplant after I started working with Gary across the street at Mount Sinai hospital. He and Dr. Greig and Dr. Langer, and of course, a bunch of the liver transplant team at the time, started the program. We were still at Mount Sinai, but Gary was running across the street to take care of patients. So that was sort of my first entry into the liver transplant program. OTTR didn't exist in those days. There were big spreadsheets that I used to fill out. We didn't have coordinators, so it was really just physicians and surgeons and of course the inpatient nurses at that time. That was the beginnings of the transplant program till we moved over in 1990 and, well, the rest is [00:04:00] history.

[00:04:00] **Brit:** [00:04:00] And Dr. Levy, how did you get involved in transplant?

[00:04:03] **Dr. Levy:** [00:04:03] Okay. So it's a very long story for my involvement in the program. I was recruited to Toronto and actually I came to Sunnybrook and my interest was in patients who had liver failure, both acute liver failure and chronic liver failure. And so, , I became very interested in the immunology of liver disease, but also transplantation because I happened to meet the founder of liver transplantation, Tom Starzl.

[00:04:37] I joined Sunnybrook, which was actually a liver center at that time. and we built a liver failure unit and acute and chronic liver failure unit. , And at that time I met Dr Langer and Dr Greig. And they convinced me to move and to move the liver failure unit. And as [00:05:00] Charmaine has said, we initially started the liver failure unit at Mount Sinai hospital. It was a joint effort but the medical aspect of it was undertaken at Mount Sinai. We established a very small unit on nine Eaton. We had two beds. Dr Greig served as a surgical leader. I, as the medical and overall leader of the liver transplant program, and Dr Langer was the professor and chief of surgery. So prior to that we used to send the patients to Pittsburgh to have liver transplants, and I actually escorted a number of the patients down to Pittsburgh, and then they returned to Toronto. Our longest living liver transplant patient who's being looked after here was actually, the transplant was performed in Pittsburgh, although his pre-care was done here in Toronto, and his post-care was done here in Toronto.

[00:05:56] **Court:** [00:05:56] Going back to your interest in the liver [00:06:00] and in hepatology, what drew you to that organ specifically?

[00:06:03] **Dr. Levy:** [00:06:03] You know, that's an excellent question. When I was young, before I even went into medical school, I met a very nice young person. She was about 19, and she developed a genetic form of liver disease and unfortunately died from that liver disease. She was being taken care of, you know here, and it made a big impression on me. And, . When I saw what was going on , in the 1970s when I was in medical school, there was no effective treatment for liver disease. So if patients or individuals who develop liver disease, whether it was acute, sudden onset liver disease or chronic, , from variety of causes, basically they had a very bad prognosis and most of the time, they had a very short lifespan, a few months or a few years and died. [00:07:00] And so when I went into medical school, I became interested , in just trying to understand, the basis of liver disease.

[00:07:08] And then I decided to go down to California to train, with the world's experts in, liver disease. That's how I met, Dr Starzl. And, he was really an inspiration because he brought liver transplantation to a success and made it possible for many, many centres around the world to be established.

[00:07:31] He's the father.

[00:07:31] **Charmaine:** [00:07:31] He's the Father.

[00:07:35] **Dr. Levy:** [00:07:35] So then when I returned to Toronto and they moved to Mount Sinai, I was very lucky . I needed. An assistant to work with me to help me manage. And Charmaine, with her talent and energy, became really one of the driving inspirations of the program. As I mentioned, Dr. Langer was really, another [00:08:00] inspiration and recognize the need to establish a program here in Toronto, but look to me. And then Dr Greig, who is an extremely talented surgeon. He and I worked very closely together. Initially we, as I said, we worked at Mount Sinai. Dr Greig was here at the Toronto General, and I would run across the street.

[00:08:24] We would, first of all, in the early days, the patients would be at Mount Sinai and we'd wheel them through the tunnel to have their transplant here at the General. And in the early days, some of them even came back to Mount Sinai, to the ICU to have their care. We looked after them conjointly, Dr Greig and I and Dr Langer.

[00:08:46] And then Dr Strasberg from Mount Sinai joined us. Dr. Taylor, who was the, he wasn't the chief of surgery at that time, but he was one of the major surgeons under Dr Langer. And so we became [00:09:00] a close knit team of surgeons and physicians who worked together. And Charmaine was the glue that sort of held us together. And then it became, as the program started to grow, it became obvious that it was going to be, it wasn't possible for us to continue to work at Mount Sinai and, and at the General. And so we needed more than two beds. They gave it, we grew to five beds on 9 Eaton, and then we. We outstripped that. And we, I remember in the 90s, we formed the liver, the GI transplant program on three Gerrard and the under ,the Premier at that time was Mike Harris, the Minister of Health with Tony Clement. So the government of Ontario gave us a large infusion of money and we opened the GI. Transplant program on three Gerrard and we chose, Scott [00:10:00] McIntaggart who I got to know through the ICU. He was an ICU nurse here at the General. , Scott. We were very lucky. Scott agreed to join us and so he came over and we establish the GI transplant program on three Gerrard.

[00:10:17] **Brit:** [00:10:17] So the liver transplant program started. And then how did it evolve into multiorgan? Because I read somewhere that you, it didn't last very long as a liver program. Yeah. I thought it was a week

[00:10:29] **Dr. Levy:** [00:10:29] About six hours

[00:10:29] So what ended up happening very quickly, so what ended up happening is when we opened the GI transplant program and we had a gala opening, with press, and we had a very talented group of nurses. I just don't want to minimize, we built this integrated program.

[00:10:49] And the day of the opening, the Premier and the Minister of Health came over. And. , I gave a an opening talk and [00:11:00] they came up to us and they wanted to know about transplantation in Toronto in general, and at that time it was very fragmented and extremely fragmented programs.

[00:11:10] So lung was up in thoracic surgery under Joel Cooper and Alex Patterson. Shaf Keshavjee ,who's the current head was a resident at that time. The heart program was at the Toronto Western under Tirone David and Carl Cardella was providing some medical input. There were two kidney transplant programs . One was at the Toronto Western. That was Eileen Young, and Liz Wright was the Nurse Manager of that program, and Carl was the Medical Director. There was a program, here at the Toronto General, , which was run by, Phil Halloran and Stan Fenton. And so that was the medical leadership. And Mike Robinett was the surgeon at the time.

[00:12:00] [00:12:00] And then there was a third program, adult program down at St Michael's, which was run by Ed Cole. Right. And so what happened was then day we opened

the GI transplant program, and. And I talked about the vision of an integrated program where nurses, surgeons, and physicians would all work together as equal partners. The minister said to me, "so why don't you integrate all of transplant in and change this from a GI transplant program into a multiorgan transplant program," and the CEO of the hospital said, "that's a great idea." Yeah. So we had literally, we were charged within the next three months to integrate all of transplantation, and it moved to three Gerrard.

[00:12:42] So I recruited Ed Cole to come up and lead the program. We moved the heart program from the Western. We moved the kidney program from the Western at that time. That was very contentious. We moved the lung program and that [00:13:00] was even more contentious because what ended up happening was Dr. Cooper, who was a good friend of mine, told me he did not believe in the vision of an integrated program, and so he left.

[00:13:12] **Courtney:** [00:13:12] What were his reservations?

[00:13:14] **Dr. Levy:** [00:13:14] You know, it's an excellent question. Unfortunately, you're not going to get Dr Cooper's input. I'm not sure where he is now, but, I, not everybody bought into the vision. There were a number of reservations. The concept of an integrated unit where nurses, physicians, and surgeons who work as equal partners didn't necessarily grab people, not all people, equally. When you form a multiorgan transplant, you gain because you bring talented people together and they feed off each other. They see, things that can be done, but you also lose. You give up power, you know, and humans don't like to give up power. That's ah, one of our bad traits. And [00:14:00] so it means that you're still the head, like Dr. Cooper would be the head of the lung transplant program. But we would all be sort of in one unit in one area, which is obvious to you guys now because you see it, you live it and you breathe it. It's very unique because most places in the world do not have what we have. They have separate units.

[00:14:20] And then the final point is that there was a resistance in the belief that the nurses in particular could not look after all of these different, they were all different, and so it would be very difficult for you guys in particular. I mean met with people like Coleen Shelton and Eileen Young and Liz Wright and they said, "no, that's not going to be a problem for us". And Scott said, "no, our nurses are very professional and we can, under proper supervision and direction, this can be achieved." And now you can see it's become a great success story. And so, you know, the, the [00:15:00] concept evolved over time. But there was, there was a lot of resistance.

[00:15:03] And then the other thing is moving from the Western into the General, there was a resistance. Just, you know, many people were very happy working in their own facility, but now, I just talked to Dr. Cardella and Dr Cole about it - he came up from St Mike's - they would, you know, they get the benefit that we have.

[00:15:22] **Court:** [00:15:22] And Charmaine, what did you think of all of this while it was happening? You're at this opening night for the liver transplant program and then all of a sudden it's becoming something completely different. Like you said, it lasted for hours. .

[00:15:35] **Charmaine:** [00:15:35] I just thought it was the most amazing thing, you know? It's like, I just think transplant is completely a roller coaster that seems to always be going up, there's hardly times that it really does go down, but when it does go down, it's that thrill of when you hit the peak. So it's just been a fantastic ride all these years.

[00:15:53] **Court:** [00:15:53] Did you have a preexisting interest in transplant before working with Dr. Levy?

[00:15:57] **Charmaine:** [00:15:57] Nope. I had no idea that it existed, to be [00:16:00] honest. And when I started with Gary, I always tell people, well, he was a hepatologist with a lab at Mount Sinai, and that was, that's all I knew. But then, as you say, things evolved very quickly.

[00:16:12] **Court:** [00:16:12] I read a quote of something you said, I can't remember where it was on the uHN sites somewhere but it said "working with Gary has been like riding a roller coaster in the dark. You never know where your next turn will be, but the end result is pure exhilaration."

[00:16:23] **Charmaine:** [00:16:23] That was for one of our galas. Yeah. .

[00:16:26] **Court:** [00:16:26] Dr. Levy, how does that quote resonate with you?

[00:16:29] **Dr. Levy:** [00:16:29] I'm sure it's true. I'm on the giving end. She's on the receiving end. Look, working with - Charmaine and I have worked together for over 30 years . We could, we collectively, could not have accomplished without her in particular . What she's given to the program has been amazing. The dedication, the talent, , the time, the energy. I mean, you know, if I said to her, okay, look, I'm, I remember I, we were running a clinic and [00:17:00] my office and I said, "look, that one of the patients crashed here across the street. I had to run across the street. Paul Greig was in the operating room doing a transplant. Paul called me. He said, Gary, you better get up to the floor and take care of the patient." I said to Charmaine, "you take care of the clinic." And literally she stayed for hours, keeping the people happy. , and then we'd come back and sometimes we didn't finish our clinics til eight, nine o'clock at night. So she gave, she gave of herself, and then all the other aspects that, that were brought to the program, she played an absolutely critical part in fundraising, raising the dollars from industry and from philanthropy. Charmaine helped organize all of the events. She played a pivotal role, in establishing the unit.

[00:17:48] You know, the story and the success of transplantation is a story of people. It really is, and it's many people. It's not, people always say, well, you know, it was one person. That's not [00:18:00] true. It is not. It is a story of people who were dedicated to the project and dedicated to saving lives, and I really believe that was , the impetus behind it. , it's what made me want to get involved in it. Watching young people suffer with no opportunity. There really was nowhere to go. No hope. And what we've done here as everybody knows , is nothing short of a miracle.

[00:18:27] **Brit:** [00:18:27] You've run the program, you've directed it. Did you ever want to be a surgeon ?

[00:18:32] **Dr. Levy:** [00:18:32] So I was in the surgical program for a very short time. My life story is very frenetic. I was training to be an engineer. At one time. I worked for IBM, running a computer division. I must admit I was always turned on by challenges. That's really what attracted me. I was in surgery. Dr Langer recruited me , but I, my real love was science and patient [00:19:00] care. It was science number one. Even though I'm semiretired, I have my laboratory still, which is functioning. I just came from my laboratory and we're still doing studies, as you're aware. And I have a love of patient care. So the answer to your question is, I loved all aspects, but I realized if I went into surgery, and I talked to Dr Greig about this, who trained incidentally as a scientist, and he ended up giving up his science career so he could do the surgery. So you have to make choices in life.

[00:19:36] You can't do everything. That's an important lesson to learn. For the first. 30 or 40 liver transplants I scrubbed in. n those days , we had no fellows. there were no residents assigned to transplantation. So I was the resident. I used to hang fluids. , I would even scrub in and hold retractors. I had trained in surgical principles, so [00:20:00] Dr Langer, Dr Greig felt comfortable with me being there. In the post-op period, Dr Greig and I used to literally, we slept in the ICU in the room beside our patients and not have, you know, we didn't sleep together in the same bed, and Scott was our nurse, I mean, he sort of would wake us up in the middle of the night and we'd have to go in and if there was any problem, we'd work with the nursing staff in the ICU. So, it was a total commitment to looking after these patients in the early days of the program.

[00:20:35] **Court:** [00:20:35] And Charmaine, what about you? Have you been in the OR? Did you spend any nights in the ICU?

[00:20:40] **Charmaine:** [00:20:40] I've never been in the OR, not even to observe, actually.

[00:20:42] **Courtney:** [00:20:42] Oh really are you curious?

[00:20:44] **Charmaine:** [00:20:44] Oh, absolutely. But I've just, you know, and now it's such a long process just to even try to observe all the paperwork it's like, oh, forget it. Oh, yeah. ,

[00:20:57] **Brit:** [00:20:57] So Dr. Levy, some of the [00:21:00] compliments that have been said about you are that you're a mad scientist and that you're fearless. So I want to know if there's ever any times that you've ever doubted some of your big decisions?

[00:21:12] **Dr. Levy:** [00:21:12] So. Doubt is not one of my traits. I always tell my residents and the interns and the fellows here, I don't like the word 'no.' The word no, doesn't sit well with me. And Charmaine knows that's true about me. I, in other words, when the administration around here, and we've had times that I've defended the nursing staff and the surgeons, like I remember, , one night driving back from London when we we did some experiments in London, Ontario, and Shaf called me and told me that the hospital told them there were no beds and he couldn't do a lung transplant.

[00:21:49] And I said to him, "don't worry, you're doing a lung transplant. If you need to do a transplant tonight, you're doing it." And I ended up calling the CEO and I [00:22:00] told the CEO that if we couldn't find the resources to be doing transplants, we shouldn't be doing transplants at all. We should close the program down and I'd be happy to go to the press

and announce that the program here was closing and know, and that certainly caught people's attention. The nurses though backed me. They completely agreed. . Everybody stood tall together.

[00:22:23] And so, so the answer to your question is doubt was not an issue with me. 'No,' was not an issue. But coming back, yes, there were many times. Where we had significant problems. In the early days, you have to understand, when we did our first two transplants, those two patients died. The first patient , Dr Starzl came up and helped. He scrubbed in, he came to Toronto. That was his commitment to us, and he helped us, , with that patient and the surgery. It was good. The post-op care was a bit frenetic to put it mildly. Everybody wanted to write an order on the chart. [00:23:00] Everybody wanted to do something and that patient got into significant problems and died. The second patient, unfortunately, , died on the operating room table. Now when I say that, nobody dies on the operating room table. They got the patient back. It was a very lovely young ish woman she had an autoimmune liver disease and her family understood without a transplant, she wouldn't live, but the surgery didn't go well. So at that time we had to make a decision and we put the program on hold. I said to everybody, "look, this isn't going to work the way it's the way we're doing it." And we restructured the program. , Dr Greig went down to Pittsburgh to do some further training. Dr Langer said, I'm gonna make a much bigger commitment , to the surgical aspect. So Dr.

[00:23:48] Taylor, Dr Langer, and Dr Greig worked tirelessly, and they did some pig experiments. They did some pig transplants, and as I said, they went to [00:24:00] Pittsburgh just to make sure they knew what they were doing and they decided that I would be the head. Dr Langer said, "look, everybody can't be the head. Somebody has to take the responsibility. And that was part of the problem."

[00:24:12] **Brit:** [00:24:12] This is a very broad question, but , post-op for the patients, what was different then than it is now? Like what are the things that you were like, "Oh, this has got to change?"

[00:24:20] **Dr. Levy:** [00:24:20] The immunosuppression has changed dramatically. In the early days we didn't have the really good immunosuppression the drugs , that we're using today, that you guys use are very, very different. ,The early preparations that we were studying in the early postoperative period, they weren't even absorbed. They were insoluble. Secondly, they were very toxic. The preparations. Some formulations, they had to be hung. They were given intravenously they had to be kept in the dark. So you had to put a bag over the bottle , and they [00:25:00] caused seizures. Seizures were very common in the early post operative period in liver transplant patients just because of these drug s. The instance of rejection was extremely high. And it was not always easy to diagnose it. We didn't have access to ultrasound and, , radiology wasn't as well developed.

[00:25:21] **Court:** [00:25:21] So just to ask a question on behalf of the listeners, um, what does it look like when someone is on the immunosuppressants that you're talking about back in the day versus the current anti rejection experience?

[00:25:32] **Dr. Levy:** [00:25:32] So today we understand dosing regimens. We played a leading role in that. We came up with target levels, which in those days, you just basically bomb people.

[00:25:44] You just literally threw caution to the wind. Dr Starzl, his approach was no rejection. We will not have rejection. So he was flooding the patients, and I remember when I was in Pittsburgh, they were all having grand mal seizures, they were [00:26:00] getting kidney failure because of these medications. But they didn't have rejection because he was giving so much immunosuppression and they died of infection. And when we came together, and I give Dr Langer a lot of credit, he understood. He didn't know anything about immunology, but he knew that, out of my training when I was in California at an immunology institute, that I had gained this level of knowledge. And so basically we worked as a team, and we developed, I out of my laboratory, we develop concepts which have now been adopted around the world. We did some work with animals. And then we did work with, with humans, looking at levels and looking at routes of administration. And the incidence of seizures went away because we started to give additional medications that we developed, then new drugs came on board, like a Sirolimus and Everolimus and Myfortic and, and so forth. And then the other [00:27:00] thing that we came to realize was there was an individualization to immunosuppression. If you were a big person, you probably needed a little bit more. If you were a small person, you needed a little bit less, depending upon the disease you had, you might need more or less. And if you had kidney disease, you probably needed none in the early period. Or we started to avoid, so we personalized immunosuppression, and that's been adopted, in the units. I think one of the great contributions of the program here in Toronto is we brought science to transplantation. We mastered the surgical techniques. Today, the surgical part is. It's easy, for lack of a better term. We have the best surgeons in the world, and then afterwards you really have to understand the biology, the immunology, of the process. And what we've gained incidentally, has had tremendous implications for the field of cancer. So cancer immunotherapy today came [00:28:00] out of transplantation.

[00:28:02] **Court:** [00:28:02] So what do you think the future is for immunosuppressants?

[00:28:06] **Dr. Levy:** [00:28:06] Well, I'm hoping with the studies we're doing in the lab that, patients will become tolerant. We've now weaned patients off. We have a biomarker study, which we're writing up and we've presented, and the data looks very promising. So some patients are developing spontaneous tolerance and they can be weaned off immune suppression. And then we're hoping to combine STEM cell transplant in some indications like we've done with a few patients, and induce tolerance. And then with the new scientists we brought to the program, like Dr. Juvet he's in lung, he's an immunologist as well, that he's isolating these specialized cells. We're hoping that we'll be able to infuse those and develop tolerance in many patients with transplant, which will spill back to the non-transplant indication so that we may not have to do as much transplantation.

[00:29:00] [00:28:59] **Court:** [00:28:59] Right. So between the two of you, you guys have seen the program grow from nothing, all the way to what it is now. There's been a lot of

world firsts at UHN and at MOT. What are some of the most memorable world firsts that you guys saw in the program?

[00:29:13] **Dr. Levy:** [00:29:13] Well, because of the shortage of organs and because we're part of world program, transplant is a world program and the community really knows each other. I remember we got a phone call, Dr Greig and I were sitting in our office, incidentally Dr Greig and I shared offices, so that was highly unique. . But we got a phone call from France, from one of our colleagues, Dr Henri Bismuth, who was the head of a program in Paris, and he had a very sick patient and wondered, did we have an organ that we could , spare, for lack of a better term, and say -- for Paris, France, and Dr Greig and I looked at each other and were, I mean, one of the concepts was, is that even [00:30:00] possible? I mean, sure, we could take it out here. I mean, we were doing that, uh, but would it last? Could we send it on a plane? I mean, obviously we're not going to send it by boat. So the question is, could we send it by plane to Paris and would it be viable?

[00:30:14] And that was the first trans Atlantic organ donor. So we said, sure, we'll help you out. And as it turned out, we had an organ that was becoming available and we gave it up, , to save the life of a young individual who had acute liver failure. So that was a major achievement.

[00:30:30] The second that I remember is the whole concept of multiorgan transplant, like doing it simultaneously. We had a young boy, who had a genetic condition. He had an iron overload condition and he, his heart was destroyed as well as this liver. So he needed a liver and a heart. But when we proposed that, some people looked at us and said, "well, they said, are you crazy?" Which was the, not necessarily a - an unreasonable question. And we said, "no." First of all, technically, to [00:31:00] do a heart and the liver at the same time is not easy. And then the whole question of how we would look after the patient and that patient actually did remarkably well. We were successful. That was written up in the nW England Journal as the first heart-liver transplant.

[00:31:15] **Brit:** [00:31:15] In 1990 there was a liver-lung?

[00:31:18] **Dr. Levy:** [00:31:18] Yeah.

[00:31:19] **Brit:** [00:31:19] As well.

[00:31:19] **Dr. Levy:** [00:31:19] Then we be started to do all sorts of combinations. Liver-kidney, liver-lung. We even did a heart-liver-lung, so we realized that we could do all of these different types of combinations and we saved lives by doing these.

[00:31:38] **Court:** [00:31:38] I think doing a heart-live- lung is amazing, and giving someone a second chance at life that would have otherwise never had it. I do not mean to be insensitive, but like if someone needs a heart, liver, and lungs - no, I don't, I don't even want to say it - like it seems like so far fetched, like how many resources did it take to help that one person? And I think it's [00:32:00] great that that one person was helped, but it just seems like a lot to go into one patient.

[00:32:05] **Dr. Levy:** [00:32:05] You know, you bring up a very good point. , and that's the point of cost utilization in the field, in any field. It's not unique to medicine. And you asked me a question a while ago about barriers. So when we started the transplant program here in Toronto, the medical community actually was very against us establishing a transplant program for the same reason that you bring up. I had to go before the Ontario Medical Association, you know, the government was willing to put the resources into it. They were willing to give it to us, but obviously there's only a finite amount of resources we can give to healthcare.

[00:32:47] And I remember giving a presentation to the old man. A couple doctors stood up and said, "this is a total waste of money, time and energy. Do you realize what we could do with that money?" [00:33:00] They said, Dr. Levy, "you're a gastroenterologist. Liver specialist. What about just treating diarrhea?" I mean, the one of the communist causes of death of gastrointestinal diseases, diarrhea, not here in Canada. Although if you go to indigenous communities with, you know, tainted water, they get terrible diarrhea-like conditions and they die of dehydration. And they said, "do you realize how many people you could save?" And I said, "I'm not arguing. , I think you should continue to put time, effort. Those are, those are admirable things to do, the simple reality is for patients who need transplant, there is no alternative."

[00:33:38] There's no alternative therapy. If you have end stage heart failure, you either replace the heart, put it in an LVAD or something like that, or they die. And when it's a young person, to me, it's hard not, , to put the expenditure out, , if it's a child or a young adult. [00:34:00] And then when you get into older adults, we could debate that, and now of course, transplant is accepted , now the argument is there's no argument anymore.

[00:34:11] **Brit:** [00:34:11] Right.

[00:34:12] **Dr. Levy:** [00:34:12] ,You're the beneficiaries of the success of the program. So people don't argue with us anymore. They see the benefits.

[00:34:18] **Court:** [00:34:18] Right. , Going back to a world firsts, are there any things that stand out to you Charmaine?

[00:34:29] **Charmaine:** [00:34:29] I just think everything that we've done here has been, quite incredible. There's nothing. , that stands out in particular because that's already a world first. So that put us on the map.

[00:34:41] **Court:** [00:34:41] That's, yeah, that's true. But when we got to 700 this year where you're like, wow, I remember when we had two beds.

[00:34:46] **Charmaine:** [00:34:46] Yes. It was astounding. And I remember, when Gary says, 'no, was not an option,' - so I just knew that one day we were going to, reach those numbers and probably certainly exceed them at the rate things are going, especially now with the inception of our [00:35:00] living donor programs. That has just broadened the numbers for sure.

[00:35:05] **Court:** [00:35:05] Yeah, for sure.

[00:35:06] **Dr. Levy:** [00:35:06] MOT is a world first. This unit is unique. And the institution knows that and the government knows it. , The establishment of an integrated, fully integrated multiorgan transplant program is a world first. This is a unique model and that's why people come from all over the world to see how, how do we do it? The commonest question we got, and we still get is , how do you get people to work together? And that's easy. You just attract people who want to work together. The people who don't want to work together, you guys don't get to meet because we don't attract them. If they don't want to work together, they're not going to come here. Okay? So the MOT concept , is a world first, and it is the way medicine should be practiced. If you had abdominal pain. And you were in the emergency department, you don't care if you see a surgeon or a physician, you [00:36:00] just want to see someone who's going to solve the problem of the abdominal pain. And that's the approach we take.

[00:36:06] So when we go down and make rounds with a nurse and with a doctor, physician, and a surgeon, and Charmaine plays a role in that because she helps us coordinate all the data. Our goal is we just want to solve the problem and who solves the problem if sometimes may be surgical, sometimes it's medical. So those are world firsts.

[00:36:27] We've been innovative in organ donation. In that regard, we started the high school education program where we go into high schools now. So Vicky Ng out of Sick Kids and and Anna, over there and many people -

[00:36:42] **Charmaine:** [00:36:42] - Trillium Gift of Life -

[00:36:43] **Dr. Levy:** [00:36:43] Trillium, we work together in a partnership when we go out and promote organ donation, the live donor program, which you're all aware of, we have the largest live donor program in North America.

[00:36:54] So , there's so many world firsts and so many centers of excellence within this [00:37:00] program. And now coming back to what you say, if the organs are available, there's still a need for more transplantation. I mean, I wish there wasn't a need for transportation originally when we started the program, we were hoping that. In parallel to what we were doing, we would understand disease better and we would do more preventive medicine. And I think that will come in time. Maybe if we can establish tolerance, we'll shut off some of the diseases like rheumatoid arthritis, Crohn's disease. And, and some of the auto immune diseases that affect humans. , , Maybe we can get people to practice better lives. The nurses have established great programs, to teach people how to live better lives, what they should be eating, exercise. Maybe they won't drink as much and so that they won't smoke, you know, and things of that sort.

[00:37:53] So I'm optimistic that yes, transplant will continue to grow. My prediction is organ donation will [00:38:00] continue to expand. Presumed consent may come to Ontario now where it's opt out, live donation will continue to grow here for the foreseeable future, I won't be surprised if within five years, you're doing 800, 900 transplants.

[00:38:17] **Court:** [00:38:17] That's fair. Yeah, I'd say that's exciting. That is exciting. Exciting. I feel like the biggest hurdle that I hear of is just space and resources. UHN is already so big. ,Where else is there to go?

[00:38:29] **Dr. Levy:** [00:38:29] well, the answer to that is innovation.

[00:38:31] Once again, so first of all, when, before you were probably born, or certainly when you were younger and we did transplant, people used to stay in hospital for four to six weeks, eight weeks, sometimes three months. Post-op kidney patients were here for two months. Today, they usually go home within a few days. So that frees up resources , if you can move people in and move them out. that will free up resources . And then the whole [00:39:00] concept, should there be other programs? My prediction also will be as the communities in the North, like North Bay, Sudbury, Sault Ste Marie kidney transplants have become a well established procedure. So I would think we'll start to offload some of the, what we might call, the easier transplants, but there'll be part of our program, and we'll do it by telemedicine. In other words, we'll be dialing in or we'll be looking through a camera. You can even do it robotically. So I think innovation will allow the program to grow, and it may be multicentered, which will be very exciting,

[00:39:35] **Brit:** [00:39:35] I wanted to know what your differences on a day to day basis. So back maybe 20 years ago when you'd come to the hospital, what was your day like then? And now although you're semi retired, but still still here almost every day. What are the, what's the difference from your day to day

[00:39:54] **Dr. Levy:** [00:39:54] If you're attracted to a field like transplantation, there's a lot of hard work associated with [00:40:00] it. So the first thing I tell , , people who want to come, regardless of whether they're nurses, it doesn't matter what aspect.

[00:40:08] You know, Albert Einstein used to have a saying, and you should try to remember this brilliance is ten percent inspiration and 90% perspiration, okay. And what he meant by that is if you, even if you're brilliant, if you don't do the work, the brilliance will never be realized. And I think that's true for transplant.

[00:40:29] And I think Charmaine, like we've had some amazing ideas and we've developed them together by talking to each other. But time is always, we've never shirked, you know? So Charm always came in early. She,she and I were always here at 0630-0700 in the morning and we worked till late at night, but we enjoyed it so much.

[00:40:50] It wasn't work for us. It was, it was a bonus. So if you're asking what the day was like, I don't think it's [00:41:00] changed in the sense that now with the added resources, having very talented nurses, in the early days of transplant, as I said, when we were up on nine Eaton and then we went to three Gerrard, we had a small cohort of people.

[00:41:16] That's really increased a lot. I mean, we have a big operation here, so I don't have to do the things. Like in the early days, the nurses wouldn't do anything. They, they liked watching me do it. So I put in all the intravenouses, I put in the subclavian lines. So it nurses would call me from nine, eight and say, "I've set up the kit for you. Can you get over and put, can you put an intravenous." They didn't want to make a mistake on these patients. They,

they knew how much effort needed to be done and so forth. So they were still an amazing part of the team, but I had to do all that. So Charm remembers, sometimes we were running a clinic, I had to run across the street, do a procedure [00:42:00]. Today I don't have to do that as much. Secondly, we have fellows and residents. They actually don't like us going around. In the early days, we, and even up until recently, we all went around. It was like, it looked like we were a Roman Legion marching off to war. Sometimes going down the hall, there would be 20 - 30 people you know, you couldn't get around. You remember? And it's still curious, still like, but you know, so now, the fellows go around and then they come back and they tell us what's going. So that's helped a lot and it frees me up so we can concentrate on the innovation. I think this is a program that's been innovative, is innovative, and will always continue to be innovative. And if you don't want to be innovative, you're probably, this isn't the right program for you.

[00:42:51] **Court:** [00:42:51] What is something you would want to tell someone who's just starting out in the positions that you started out when you began the program?

[00:42:59] **Dr. Levy:** [00:42:59] I would tell [00:43:00] them this is the best program and the best discipline in the world. You couldn't choose anything better. And as I said, part of the reason is because it's such a people oriented field. You've got patients who need you, you've got talented professionals in all walks of life, and they want to work together and they want to learn. And the opportunities to be successful are just tremendous here.

[00:43:26] **Charmaine:** [00:43:26] I agree with Gary a hundred percent it's a great place to work. You work hard. your career has, can certainly blossom. Mine certainly did. I started off, you know, being a secretary, across the street and now I'm an administrative coordinator. I do a lot more than I ever imagined, and it's because of the growth of transplant. I was able to grow my career.

[00:43:49] **Brit:** [00:43:49] Dr. Levy, if you didn't work in hepatology with livers, what other organ would you choose if they said "no more livers, Dr. Levy, you have to choose a different [00:44:00] organ." Which one would it be?

[00:44:01] **Charmaine:** [00:44:01] I thought he told you "no" was not an option.

[00:44:06] **Dr. Levy:** [00:44:06] Yeah. It's a good question. Incidentally, I'm not wedded to one organ. When I was traveling, I met a very talented person. Her name was Heather Ross. I went to Stanford and gave lectures. They wanted to know about MOT. They also wanted to know about personalized medicine and immunosuppression and, and how one made the diagnosis of rejection. So they invited me down for three or four days as a visiting professor, and I met this very talented young woman who was a resident, a fellow in Stanford, and I recruited Heather here to run the heart transplant program.

[00:44:45] Well, Heather was a, an N of one because, because we were doing only five. Heart two to five heart transplants. We couldn't recruit 10 people to help her. So I looked after the heart transplant [00:45:00] patients with Heather. So coming back to what you're saying is, I think if you love transplant, organ specificity is irrelevant. It really is the, the goal has gotta be to save lives and whether you're saving the life of somebody with heart disease,

lung disease, kidney disease, , liver disease, it's not important. What's important is saving lives and just diving in. Yes. It can be scary. I'm not a cardiologist, but , you know, there's lots of support systems , in medicine that can help us.

[00:45:36] **Brit:** [00:45:36] It's kinda like the nurses, cause we are not wedded to one organ, cause we, like you said, long time ago, multiorgan was not a thing, you know, to bring us all together. So now all of our nurses. Work on every organ. We know every organ differently and know that everything isn't all the same, but

[00:45:57] **Dr. Levy:** [00:45:57] there is a commonality. There's [00:46:00] a commonality and there's a difference. So the good news is, theres outreach, you know, the expertise is here and you can get it.

[00:46:06] **Court:** [00:46:06] Great. Well thank you both so much. Thank you. Thank you.

[00:46:11] **Courtney:** [00:46:11] Thanks for listening to this episode of Living Transplant. If you have questions or suggestions for future episodes, email us@livingorgandonation@uhn.ca.

[00:46:22] **Britt:** [00:46:22] Don't forget to subscribe, rate, and review Living Transplant on iTunes, Spotify, or wherever you listen to podcasts

[00:46:29] **Courtney:** [00:46:29] and follow us @givelifeUHN on Facebook, Twitter, and Instagram.

[00:46:33] **Brit:** [00:46:33] See you next time

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