Starting A Limb Preservation Clinic: A Roundtable Discussion

Dr. Karim Manji

Abstract: Limb preservation clinics represent a paradigm shift in the management of complex diabetic foot disease and chronic limb-threatening ischemia (CLTI). Multidisciplinary limb preservation programs integrate vascular surgery, podiatric surgery, infectious diseases, endocrinology, nursing and other health professionals to provide coordinated, timely and evidence-based care. This collaborative model moves beyond reactive amputation-focused pathways toward proactive limb salvage strategies that address both 'toe' and 'flow'. This roundtable discussion brings together leaders in podiatric surgery and wound care disciplines to explore how integrated limb preservation models can be scaled, sustained and optimized.

Key words: *limb preservation, collaborative model, toe and flow, clinics, limb salvage pathways, podiatric surgery, wound care*

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Limb preservation clinics represent a paradigm shift in the management of complex diabetic foot disease and chronic limb-threatening ischemia (CLTI). As rates of diabetes and peripheral arterial disease continue to rise across Canada, the downstream consequences—ulceration, infection, hospitalization and major amputation—carry profound human and system-level costs. Multidisciplinary limb preservation programs integrate vascular surgery, podiatric surgery, infectious diseases, endocrinology, nursing and other health professionals to provide coordinated, timely and evidence-based care.

This collaborative model moves beyond reactive amputation-focused pathways toward proactive limb salvage strategies that address both 'toe' (local wound and infection management) and 'flow' (optimization of perfusion), recognizing that successful limb preservation requires simultaneous attention to both components. The importance of this approach is underscored by the work of many podiatric and vascular surgeons.

One Canadian team in Calgary established the Zivot Limb Preservation Centre in 2016, and has now established its second site in Edmonton to serve Northern Alberta in 2025. In their evaluation of a multidisciplinary limb preservation model in Alberta, they demonstrated a significant reduction in diabetes-related major amputation rates following program implementation. This landmark analysis, published in the *Journal of the American Podiatric Medical Association*, provided compelling provincial-level evidence that structured interdisciplinary care can alter the trajectory of limb loss.[1] Building on this foundation, a subsequent study further demonstrated that a regional multidisciplinary limb preservation program was associated with reductions in hospitalization rates, reinforcing the health system value of coordinated limb salvage pathways.[2]

Together, these findings affirm that 'Toe and Flow' clinics are high-impact clinical innovations that improve patient outcomes while reducing acute care burden. This roundtable discussion brings together leaders in podiatric surgery and wound care disciplines to explore how integrated limb preservation models can be scaled, sustained and optimized to prevent avoidable amputations and transform limb preservation care delivery.

Questions were posed to the roundtable panel by the author, Dr. Karim Manji, Director of Research at the Zivot Limb Preservation Centre in Alberta, Canada.

Expert Panel

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Q: Where is your limb presentation clinic located and when did it start? Who did you have to include in your Limb Preservation Clinic (LPC) - what was your irreducible minimum?

BH: Our limb preservation clinic is in the hospital. This provides us easy access to the inpatient units, as well as to the operating rooms, if we need to leave during clinic to do a case and then return. The clinic started in 2018 when I was recruited to the University of Alabama at Birmingham. Our program is under the division of vascular surgery and teaming with vascular surgery is essential to the development of a limb preservation program.

KP: Our limb preservation clinic was started in Edmonton, AB in 2025. The clinic was started with a collaboration between podiatric and vascular surgeons, as these specialties were considered the "irreducible minimum". We also have the ability to refer to internal medicine, infectious disease, diabetes educators, PT and OT, as well as other hospital based specialties.

FH: Our limb preservation clinic here is in Calgary, Alberta, at the Peter Lougheed Centre. We started the limb preservation clinic back in 2016. In conjunction with outpatient clinics, working side by side with other specialties, like infectious disease, vascular surgery, orthopedics and internal medicine, we were all working together in different pods as part of the outpatient clinics at the hospital.

Q: What were some of the biggest challenges to overcome when you started talking about building an LPC in your city?

BH: We have not really had any significant challenges with developing the program given the fact that it was determined that it was needed. It was developed with the support of our division, the Department of Surgery, the university and the hospital system. At this point our challenge now is appropriate clinical space. We currently have outgrown our space, and it is also located in a place which does not have easy access for patients who are trying to stay off their foot.

We are not near radiology, which can be an issue as well. We cover several hospitals within our health-care system, and I envision the day when we will become a single site program with patients at the other sites triaged and then sent to the hospital that our program would be housed in.

KP: Being based in Alberta, government funding and participation, as well as charitable donations, were needed to start the program. Because of this it took over 10 years before the clinic was finally established.

FH: Oh, there was a lot, anything from logistics involving record keeping, being involved in certain software for patient registration and getting prescription abilities in Alberta for the AADL

program for multidisciplinary clinics, so patients can have offloading shoes with insurance coverage. Also, having the ability to get orders sent and directed in the right location as well as referrals. All these minor details that we generally don't think about on a day-to-day basis were actually the most time consuming to sort out to get a functioning clinic.

Q: How many surgeons work on your team, and do you provide emergency call and patient services?

BH: Currently, our team consists of four podiatric surgeons and a nurse practitioner. Monday to Friday from 7am to 4pm our nurse practitioner does the inpatient rounding and sees any new consults and then staffs them with the on-call podiatric surgeon. In the evenings and on weekends the vascular surgery interns provide call coverage. We will see the inpatient consultation and then communicate with the on-call podiatric surgeon.

KP: Currently, there is one podiatric surgeon, with plans to expand, and approximately six to seven vascular surgeons involved in the limb preservation clinic. As the sole podiatric surgeon, I do provide in-patient services and make myself available for emergency calls. However, there is no formal call service. As the program expands, we plan to develop a formal call service to service the Edmonton area. The vascular surgeons take calls in the city.

FH: We're a group of seven podiatric surgeons that cover call coverage for emergency rooms and inpatients. Patients that come in can also be seen at the clinic.

Q: What do all LPCs need, regardless of location?

BH: All limb preservation clinics need close working relationships with vascular surgery. There needs to be vascular surgeons within the group that are dedicated to limb preservation. Patients with peripheral vascular disease who also have a diabetic foot complication may require multiple vascular interventions for healing to occur, so there is the need for vascular surgeons that are willing to do this and do not look at it as a 'one-and-done' deal. There also needs to be infectious disease clinicians presents to assist in the management of soft tissue and bone infection. This also requires a team of podiatric surgeons who are dedicated to limb preservation.

KP: In my opinion, all limb preservation clinics need a combination of podiatric and vascular surgeons. They need to have the ability to treat acute infections/emergencies as inpatients, along with treating chronic wounds on an outpatient basis. They need access to OR minor surgery facilities to provide the necessary interventions. Additionally, having easy access to a radiology centre where X-rays and vascular studies can be performed the same day, or in an expedited fashion, is beneficial.

FH: The number one thing is the ability to provide care for these patients; to be able to evaluate a wound, see if the wound is infected and be able to direct proper care. For example, the ability to have access to a vascular surgeon and/or infectious disease specialist, and if a patient needs to be treated with offloading, then the patient does need to be able to access that offloading device.

Q: What does your remission surveillance program look like?

BH: Currently, patients who are in remission will follow-up with our podiatric surgeons for surveillance. We are in the process of hiring a clinical podiatrist who will develop a remission and high-risk diabetic foot clinic. In my opinion, preventative care and education is overlooked and is probably the most important aspect of the limb preservation program. If we can prevent complications from occurring, then we are way ahead of the game.

KP: We currently use the IWGDF risk stratification system[3] to determine how often a patient in remission needs to be evaluated. If the patient falls in the high risk ulcer category they are encouraged to follow up with the limb preservation centre. Lower risk patients

have the option of following up in the clinic, with a community podiatrist or a diabetic high risk foot clinic.

FH: I think that's a very hot topic right now. Unfortunately, I think a lot of the clinics, due to funding and cost, are unable to have available staff to monitor patients. There is a limitation of being able to treat or to have a surveillance program in place. And in my opinion, that's a big reason why some of the patients re-ulcerate - it is due to the gap that we have in the remission surveillance program.

Q: Is it important to have a local champion? Who is yours?

BH: Because this problem is so prevalent in the Southeastern United States, we have many champions for our program. All the podiatric surgeons in our group are very passionate about diabetic limb preservation and are very strong advocates for the program. Our Chief of the Division of Vascular Surgery, as well as all the faculty members in our vascular group, is very supportive and vocal about the importance of our program. Our infectious disease colleagues and plastic surgeons are also extremely supportive of what we do and have been involved in the development of our program.

KP: It is important to have an advocate in the greater health-care system to build trust with other physicians, as well as to educate on appropriate referrals, as early identification is key. The local champion also helps to advocate for continued use of resources and resolves disagreements between team members and differing services. As our program is new in a city that did not previously have podiatric surgeons, the head of vascular surgery is our local champion.

FH: That's a good question, I think, unfortunately, some clinics have put one person in charge of the whole program, but it does leave that program vulnerable. I think it's best within a program if everybody is given the ability to become their own champion, and to be able to actually be a champion for their patients.

Q: Educating the next generation seems to be a vital component, what is your centre doing in terms of education?

BH: This year, we started a Diabetic Limb Preservation and Reconstructive Surgery fellowship. We have our first fellow this year, and it has been a very rewarding experience so far. In the next couple of years, we are looking at turning the fellowship into a two-year program, where a large amount of time can be committed to research.

KP: Currently, we participate in a weekly journal club with the Rose Zivot Fellowship program based in Calgary. As our program grows, we hope to get more involved with hands-on training of students, residents and fellows.

FH: Our centre is actually involved in educating the next generation of podiatrists, by having students in our clinic. We also have a fellowship training program. Here we have international doctors that come and spend some time rotating through our clinics. We also have infectious disease residents and vascular surgery residents that spend some time with us.

Family medicine residents are also being educated on the topic of diabetic foot care on a yearly basis. As the topic of diabetic foot ulcers is becoming something that everybody in the medicine is more aware of, I think that more people are developing an interest in how to better treat these patients. But most importantly, seeing the urgency in treating these patients.

Q: What are some effective strategies to educate local stakeholders on the work of your LPC?

BH: We have not really done any external marketing for the program. I think that the outcomes that we have achieved have resulted in patient referrals. Home health-care nurses who see your patients in follow-up in the community have also been very strong advocates for our program as they have seen the work that we have do.

There is such a high volume of patients that need care in the area that we really have not had to market the limb preservation practices.

However, once our program has stabilized, we will start more outreach programs and, with this, more marketing of our clinic.

KP: I have found small presentations to various departments helped to educate, referring providers on the new service being offered.

FH: Fortunately for us in Alberta here, a wonderful group called a Strategic Clinical Network stared a few years ago with a passion for diabetic foot. They put forward guidelines and pathways on how to treat and refer patients that have diabetic wounds, how often they should get a diabetic foot exam and which health-care professional should be involved in doing a diabetic exam, and these were actually distributed through the community through family doctors and primary care networks. I think the Strategic Clinical Network did a fantastic job developing these pathways and educating the public about how to properly use them.

Q: Timely access to care is critical with managing patients at an LPC, what does your site provide for timely access to urgent surgical care?

BH: Access to the operating rooms for urgent or emergent patients has not been a problem. Having relocated from Canada where emergency cases start after the regular OR day has concluded, I am now able to add two or three cases on and still be done by 5 or 6:00pm.

When on-call there is also a lot of access on Saturday and Sunday. If our members are on-call, they can manage patients that require further debridement or even a definitive procedure to get them moving closer to discharge.

KP: We are set up to perform the majority of foot and ankle cases under local anesthetic in our clinic. This allows us to perform more surgeries in a day than what could be done under sedation. This also allows us to provide same day surgery if an urgent case presents to the clinic or an inpatient emergency consult is placed.

FH: Yeah, you all know the good old saying, 'time is tissue'. That still stands today. When a patient has an infection, the faster you get to it, the faster you drain out the infection or remove the infected bone, the faster you can get rid of the infection and get the patient back to their activities, the less tissue they end up losing. Fortunately, we have something called minor surgery clinic where patients can have small procedures done under local anesthesia. So, we don't have to keep these patient NPO and wait or list them for surgery. They don't need to go under general anesthesia, or deeper anesthesia for minor procedure.

Like incision drainage, debridement or even partial foot amputation, those can be done under local anesthesia. And here we're able to do them quite rapidly because that minor surgery clinic is readily available for these high-risk patients.

Q: Lastly, what is one new team member you hope to bring in to your LPC in the near future?

BH: We recently added two new faculty members with expertise in Charcot reconstruction utilizing the newest internal fixation modalities, as well as intramedullary nails for pantalar fusions and external fixation.

We continue to recruit podiatric surgeons as our program expands into new hospitals that our system has acquired. At some point I would like to add a team member who has a strong interest in research and have time allocated for them for this.

KP: Being a new service with only one podiatric surgeon, we hope to expand the number of podiatric surgeons to increase the number of patients that can be seen, as well as to continue providing care in a timely manner.

FH: Well, you know, there's always that hope that somebody is going to come up with the magic treatment for healing all types of wounds. But unfortunately, this has not happened. I've been practicing for a few decades now and if I look back at my career, I can see that the treatment of diabetic foot has changed significantly over the past few years, and I think it's been a combination of endovascular surgery, new antibiotics and different treatment for the patient's diabetes.

Unfortunately, I still think that the number of diabetic wounds and amputations are still way too high. It would be nice to have a new team member who can help us by being more involved in the surveillance and prevention of wounds that have healed and in preventing recurrence.

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