

# 4 Building Blocks for a Successful Limb Preservation Program

This framework provides a universal approach to diabetes.

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Through the work and collaboration of podiatrists with specialists in vascular surgery, plastic surgery, infectious disease, and orthopedics, numerous clinical practice guidelines have been developed for diabetic foot management.<sup>12-17</sup>

These collaborations and studies have shown a significant decrease in lower extremity amputations with an interdisciplinary approach to diabetic foot ulcerations.<sup>4,18,19</sup> Other improvements such as a decrease in the number of hospital admissions and amputations, improved limb salvage and improved mortality rates were a direct result of this team approach.<sup>6,18,20</sup>

Hospital systems and academic centers around the country have taken notice and have begun to develop and build teams dedicated to the diabetic foot.<sup>15,19,21,22</sup> Here we provide a simple framework for a sustainable and replicable interdisciplinary limb preservation team.<sup>23</sup>

At the Southwestern Academic Limb Salvage Alliance (SALSA) at Keck School of Medicine, University of Southern California, our limb preservation program consists of an interdisciplinary team working together to assess, appropriately triage, and treat patients with the ultimate goal of limb salvage.<sup>23</sup> The centerpiece of our team consists of podiatric and

vascular surgery, lovingly referred to as “Toe and Flow.”<sup>7,19,24</sup>

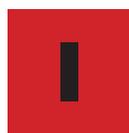
Utilizing our resources, we developed four essential building blocks for an effective and highly coordinated interdisciplinary team: 1) Establishment of a “hot foot line”, 2) Development of a wound-healing clinic, 3) Initiation

of a remission clinic, and 4) Installation of a screening clinic<sup>25</sup> (Figure 1). With each step, we also have the ability to assess and audit our outcome measures to further improve our clinical care for these patients.

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lar status are treated medically with antibiotics and surgery as needed by podiatric surgeons.<sup>26</sup> Treatment of these ulcerations often requires multiple stages. Once the acute issues are resolved, further needs will be addressed by the appropriate specialist.



## Building Block 1: Establishment of a “Hot Foot Line”

Immediate identification of patients with diabetic foot ulcers in the emergency room, clinic, or inpatient settings is vital to initiating proper care. Establishing a “hot foot line” allows emergency physicians and hospitalists to reach the limb preservation team rapidly to form a comprehensive assessment of



## Building Block 2: Development of a Wound-Healing Clinic

A well-organized wound-healing clinic serves as a hub to evaluate and treat tissue loss. It allows an interdisciplinary team to continue to monitor the wound healing process and to employ appropriate wound care modalities to facili-

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tate wound closure.<sup>8</sup>

Additionally, due to the nature of the interdisciplinary team approach, wounds with different underlying etiologies can be addressed accordingly. An ideal wound-healing clinic has podiatric surgeons, vascular surgeons, and wound care nurses/physical therapists to address wound care modalities, bony and soft tissue deformities, and the underlying disease.<sup>24</sup> Each patient would have access to appropriate surgeons for a comprehensive intervention plan. Clear communication and close-knit working relationships are necessary to provide an optimal outcome.

### 3

#### Building Block 3: Initiation of a Remission Clinic

After the wound healing is achieved, the patient will continue outpatient care in a remission clinic to maximize ulcer-free, admission-free, and activity-rich days.<sup>27</sup> Patient education and self-care are the focus during remission to prevent further injury. Patients will have access to devices such as appropriate footwear and multi-density insoles to prevent re-ulceration.<sup>28</sup> Under the guidance of physical therapy, patients can

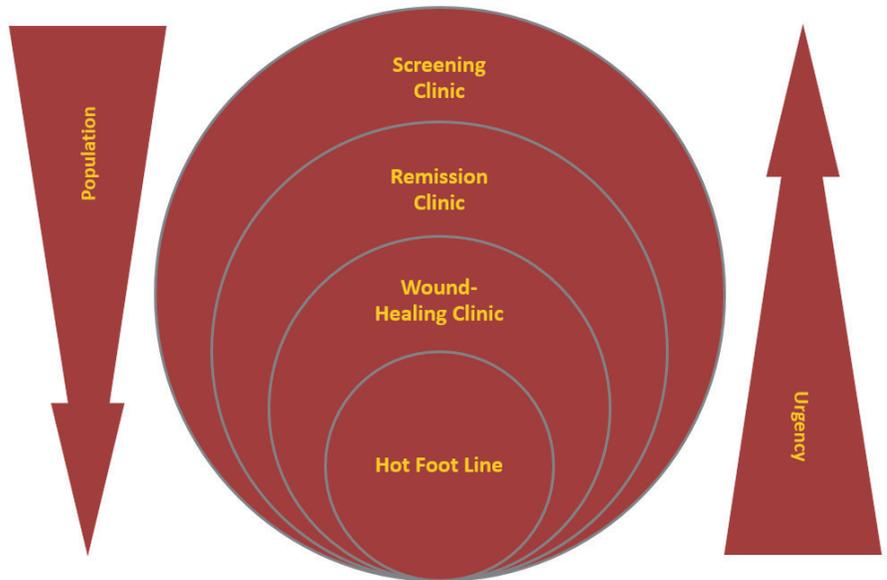


Figure 1: Concept model of a limb preservation program illustrates the 4 building blocks in relation to the order of patient acuity and scale of population coverage.

increase their daily activities and improve their quality of life.<sup>29</sup> Underlying deformity can also be addressed with medical management and elective surgical reconstruction.<sup>4,30</sup>

### 4

#### Building Block 4: Installation of a Network of Screening Clinics

The final building block of a

limb preservation program concentrates on prevention. Comprehensive foot exams are highly recommended and vital to improved outcomes.<sup>28,31</sup> A “three-minute foot exam” is developed to assist primary care clinicians to identify high risk diabetic patients.<sup>32</sup> High risk patients are referred to specialists for additional and appropriate care

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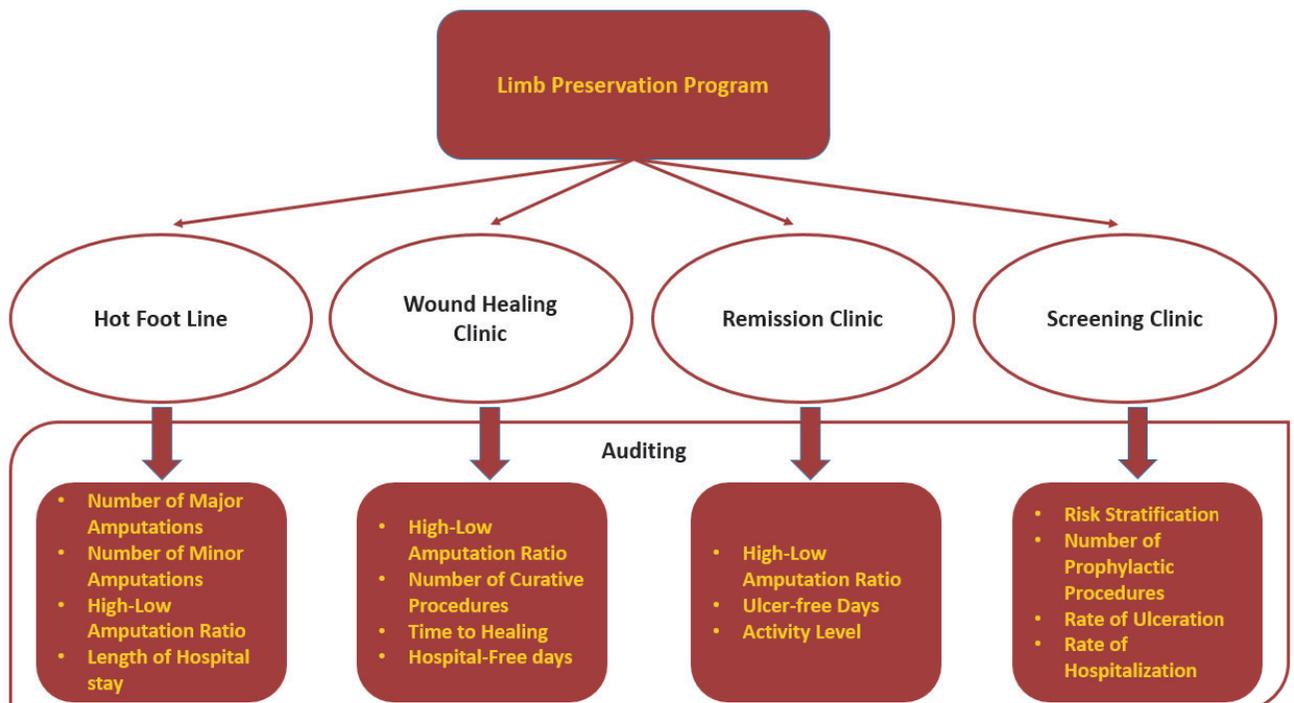


Figure 2: Structure and suggested measurable outcomes for each building block of a limb preservation program.<sup>35</sup>



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such as offloading techniques and/or surgical consultation. In the event of an active but non-infected diabetic foot ulcer, the patient

## A Measure of Success: Auditing

Patient outcome-based programs have been implemented by many medical specialties.<sup>33</sup> The success of these programs is achieved through a process of continuous quality im-

provement and create solutions that are targeted and specific to the identified deficiency.

## Conclusion

In conclusion, a successful limb preservation program is vital to combat a complex medical condition like diabetic foot ulcers. It relies on competent and enthusiastic individuals working together as an interdisciplinary team. The recommended four building blocks are designed to provide a framework for a limb preservation program around the world. Upon establishing a limb preservation program, the continuing effort to audit by means of quality improvement and the concept of a clinical microsystem will ensure a successful and sustainable program. **PM**

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may be sent to the wound-healing clinic. If the patient presents with an actively infected diabetic foot ulcer, the “hot foot line” is then activated. Any high risk patients without active wounds can be monitored in the remission clinic. Through this intricate network of four building blocks, patients can receive appropriate care depending on the stage of the condition, and providers can navigate the patients’ healing process.

provement (cQI).<sup>34</sup> To ensure the success and sustainability of a limb preservation program, cQI plays a crucial role. Performance of the limb preservation program should be evaluated as a whole as well as assessed individually per each building block via outcome and/or process measures as suggested in Figure 2. By continuing monitoring these measures, clinicians in the interdisciplinary team will be able to identify any deficiencies in a par-



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