



Objective

Assess the impact of a collaborative continuum of care model between a Wound Care Center® and vascular surgery practice on quality of care and outcomes.

Approach

Of the 7,616 procedures that were reviewed by Stanford Health Care's Vascular & Endovascular Surgery practice, 1,751 procedures met inclusion criteria. This study included patients who underwent lower extremity interventions over a three-year period before (Before Wound Center (BWC) n=735) and after (After Wound Center (AWC) n=1,503) the opening of a Wound Care Center.

Results

Increased care coordination between the vascular surgery practice and the Wound Care Center resulted in a 38 percent decrease in major amputations for patients one-year post vascular intervention. Within a four-year median duration of follow-up, the amputation risk for patients treated after the introduction of a Healogics Wound Care Center was approximately 50 percent of patients treated before wound center initiation. Health economic models show preventive strategies for amputation are cost-effective or even cost saving when they result in at least a 25 percent decrease in amputation incidence³.

Reducing Amputations in the Community:

The impact of a collaborative continuum of care model between a Healogics Wound Care Center and vascular surgery practice

Introduction and Background

Nearly 7 million Americans are living with a chronic wound. Due to the growing, aging population in America and incidences of chronic diseases more common in older adults, such as diabetes and peripheral artery disease (PAD), the number of patients living with a non-healing sore or ulcer is only expected to rise. According to the U.S. Census Bureau, in 20 years the percent of the total U.S. population age 65 or older is expected to increase to 21 percent. PAD for example, a circulatory disease commonly associated with non-healing wounds, affects over eight million Americans, and 12-20 percent of Americans age 60 and older¹.

Coronary artery disease, peripheral artery disease and other issues with the heart and vessels can cause blockages that obstruct the flow of blood. This decreased blood flow hinders the delivery of oxygen and nutrition needed for proper wound healing. Given that 82 percent of leg amputations are due to poor circulation of the affected limb, Healogics advocates a multi-disciplinary approach to wound care. According to the Society of Vascular Surgery and the American Podiatric Medical Association, a multi-disciplinary approach to patient care can lead to increased patient satisfaction, enhanced healing and limb preservation through a decrease in the morbidity and mortality associated with amputations¹.

The use of standardized wound care, in conjunction with vascular intervention, diabetes management and other specialties, when appropriate, has been shown to greatly reduce amputation rates².

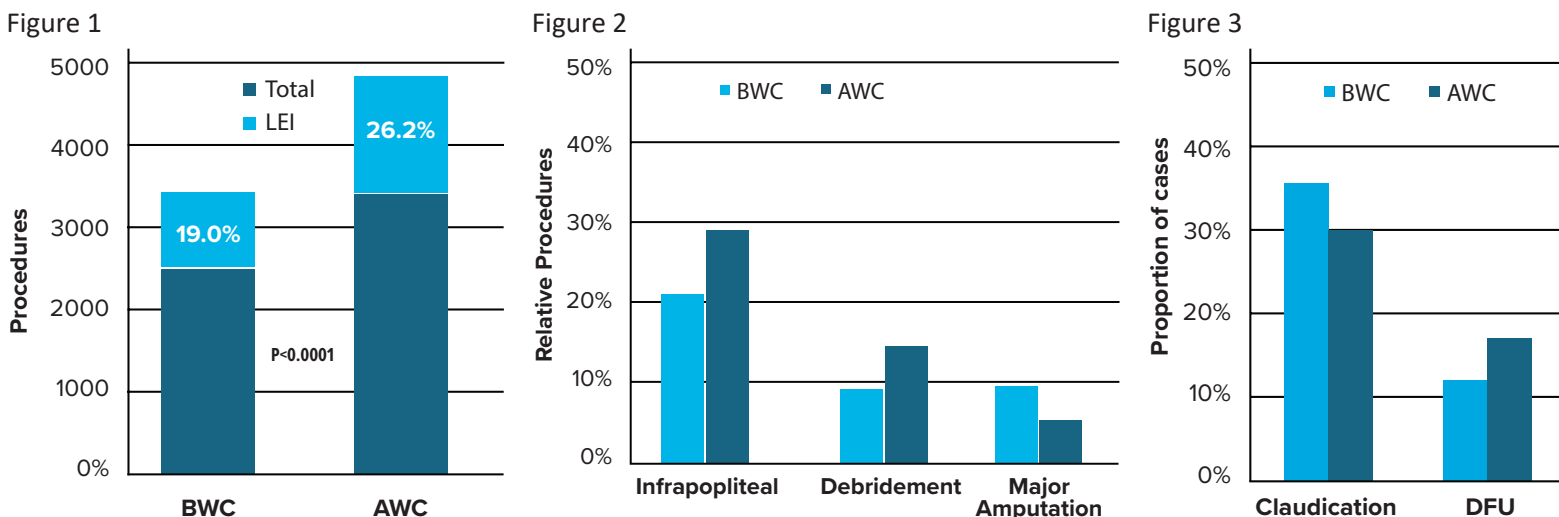
There is significant overlap in patient demographics between a vascular surgery practice and a Wound Care Center. Healogics sought to advance the understanding of the impact of a Wound Care Center on a vascular surgery practice by investigating differences in the case volume, practice patterns and outcomes of patients treated by Stanford Health Care's Vascular & Endovascular Surgery practice following the opening of a Healogics outpatient Wound Care Center.

Data and Methods

Of the 7,616 procedures that were reviewed by Stanford Health Care's Vascular & Endovascular Surgery practice, 1,751 procedures met inclusion criteria. This study included patients who underwent lower extremity interventions over a three-year period before (Before Wound Center (BWC), n=735) and after (After Wound Center (AWC), n=1,503) the opening of a Wound Care Center® (total time frame: October 2010-October 2016)³. All revascularizations, debridements and amputations were included, while trauma and acute limb ischemia were excluded. The procedures included were surgical debridement, major and minor amputation and revascularization.

Figure 1: After the opening of the Wound Care Center, procedures related to limb salvage represented a greater proportion of overall cases performed by the vascular service (19 percent vs. 26 percent; $P < 0.0001$).

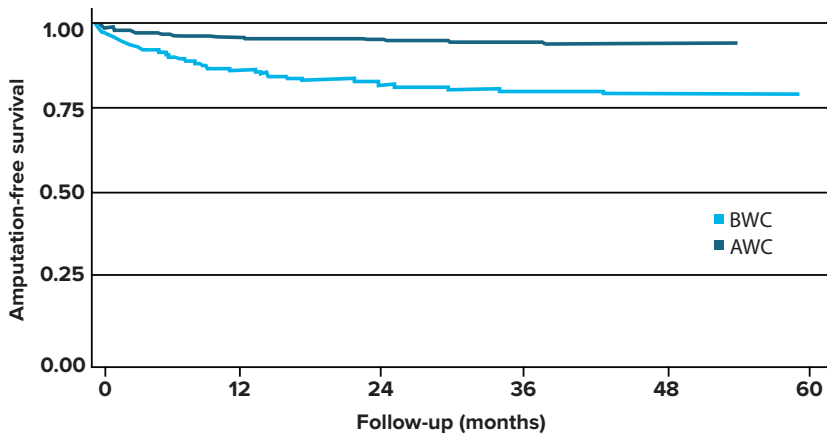
Treatment during the AWC period was associated with a reduced risk of major amputation (adjusted HR: 0.41; 95 percent CI: 0.27-0.62; $P < 0.001$)³, but no difference in all-cause mortality was noted.



The volume of lower extremity interventions increased by 64 percent, from 662 procedures BWC to 1,085 procedures AWC³.

Figure 2: There was no difference in type of revascularization performed between the two study periods, although surgical debridements (8.9 percent to 13 percent; $P = 0.01$) and infrapopliteal endovascular interventions (21 percent to 28 percent; $P = 0.04$) significantly increased.

Figure 3: Compared with BWC patients, AWC patients more frequently presented with diabetic foot ulcers (DFUs) (7.3 percent vs. 13 percent; $P = 0.002$) and chronic wounds (39 percent vs. 45 percent; $P = 0.05$).



At one year of follow-up, major amputation rates were significantly lower in the AWC group; 5.5 percent vs. 8.8 percent in the BWC cohort (P = 0.04).

Figure 4: Treatment during the AWC period was associated with a reduced risk of major amputation (adjusted HR: 0.41; 95 percent CI: 0.27-0.62; P < 0.001)³, but no difference in all-cause mortality was noted.

Conclusions

How can a Wound Care Center and vascular surgery group collaborate for improved patient care? In this analysis, we see the significant positive impact in patient outcomes through preventive care and intervention. Improved care coordination between a Healogics Wound Care Center and a vascular surgery group can reduce patient risk for major amputation.

Within a four-year median duration of follow-up, the amputation risk for patients treated after the introduction of a Healogics Wound Care Center was approximately half that of patients treated before wound center initiation. Health economic models have found that preventive strategies for amputation are cost effective or even cost saving when they result in at least a 25 percent decrease in amputation incidence³.

During the time of this study, there was a significant increase in wound care-related vascular surgery procedures. Patient outcomes were improved by the coordination of care between the wound care and vascular practices, seeing as much as a 38 percent decrease in major amputations one-year post vascular intervention.

*“Patient outcomes were improved by the coordination of care between the wound care and vascular practices, seeing as much as a **38 percent decrease in major amputations one-year post vascular intervention.**”*

Several potential factors may have contributed to the improved patient access and outcomes. Healogics’ comprehensive Community Education program likely expanded community presence and increased referrals of potential limb salvage patients from the Center to the surgical service, thus explaining the increase in the number of patients presenting with DFUs and chronic wounds.

The improved outcomes may have also positively impacted referrals of patients at risk for limb loss from the community at large. In addition, the multidisciplinary model of Healogics Wound Care Center undoubtedly strengthened the community’s cross-functional wound care network. **The findings described herein emphasize the positive impact of a Healogics Wound Care Center, not only in the lives of those living with chronic illness and non-healing wounds, but also in the medical community as a whole.**

Findings	Before	After
Volume of Vascular Procedures	662	1085
Volume of Lower Extremity Interventions	19%	26%
Increase in Number of Patients with Wounds	39%	45%

Sources

1. National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention
2. Krishnan S, Nash F, Baker N, et al: Reduction in diabetic amputations over 11 years in a defined U.K. population: benefits of multidisciplinary team work and continuous prospective audit. *Diabetes Care* 2008;31:99-101.
3. Benefit of multidisciplinary wound care center on the volume and outcomes of a vascular surgery practice; Alyssa M. Flores^{1,2}, Matthew W. Mell, MD, MS³, Ronald L. Dalman, MD¹, Venita Chandra, MD¹; Presented at the 2018 Vascular Annual Meeting of the Society for Vascular Surgery, Boston, MA, June 21-23, 2018.

All data contained herein was provided to Healogics by Stanford Health Care's Vascular & Endovascular Surgery practice.

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