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Integration of the SVS Wifi Classification System for Ulcer Staging and Management in an

Amputation Prevention Program

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## **Executive Summary**

### **Introduction of the Problem**

Chronic limb-threatening ischemia (CLTI) is the most advanced form of peripheral arterial disease. The mortality rate for a patient diagnosed with CLTI at five years is 50% and an astonishing 70% at ten years. If left untreated, 10% of patients at one year require amputation due to ischemic ulcer development (Cooper, Pena, & Benenati, 2016). In 2015, in the United States, an estimated 504,000 individuals lived with a significant amputation due to CLTI (Conte et al., 2019). This number was projected to more than double by 2050.

Initially, the CLTI patient population presented with pure ischemic ulcers when smoking was the dominant risk factor; now, the most common etiology for foot ulcers is neuro-ischemia due to the increase of diabetic patients globally (Conte et al., 2019; Mills et al., 2014). Historical classification systems (Rutherford and Fontaine Classification systems) were also based on a purely ischemic etiology and were not intended for use with patients who have diabetes mellitus (DM).

The wounds of a diabetic patient are not purely ischemic; they bring a more complex and varied clinical picture and multiple factors for wound healing. The clinical decision-making for CLTI is challenging because of the heterogeneous presentation and it requires care across the clinical spectrum. Because of this, amputation prevention programs have been developed (Causey, 2016).

Amputation prevention programs offer a multidisciplinary approach for the treatment of nonhealing wounds to decrease amputation risk. One drawback of a multidisciplinary team is that various classification systems are being used, which leads to a disconnect in the vernacular to describe the patient wounds and fragmented care. The Global Vascular Guidelines (GVG)

addressed this issue by endorsing the adoption and use of the Society for Vascular Surgery (SVS) Lower Extremity Threatened Limb (Wound, ischemia, foot infection [WIFI]) classification system.

This DNP project aimed to incorporate the SVS Wifi classification system into the local amputation prevention program. The program developed in 2017 focused on decreasing the amputation rate in the Southern Illinois area by reducing patient care barriers and bringing a multidisciplinary approach to wound management. The integration of the SVS Wifi classification system allows for a validated, inclusive, and unified classification system. Before project implementation, there was a lack of routine documentation of any historical classification system by the CLTI providers. When providers did use prior classification systems, there was no standard classification system utilized.

### **Literature Review**

The Society for Vascular Surgery (SVS) developed the Lower Extremity Threatened Limb (Wound, Ischemia, foot Infection [WIFI]) Classification System in 2014 to address problems with inadequate evaluation systems, patient demographic changes, and the shifts in treatment options (Kimura et al., 2019; Darling et al., 2017; Mills 2014; Mills 2017). The SVS Wifi classification system was developed by merging the existing CLTI and diabetic foot ulcer classification systems (Darling et al., 2017; Van Reijen et al., 2019) into one encompassing classification system.

The SVS Wifi classification system incorporates the three main aspects of wound healing, the extent of the wound, presence of ischemia, and foot infection severity. Each aspect of wound healing has specific grading system criteria. Because there are three components, wound, ischemia, foot infection, each with four grades of severity ((0) none, (1) mild, (2)

moderate, (3) severe), this system results in 64 potential limb presentations that were each assigned to one of four clinical stages (very low, low, moderate, high risk) correlating to the anticipated amputation risk and potential benefit for revascularization of the limb (Mills, 2017).

The SVS Wifi classification system is a validated classification system that will provide the risk of amputation at one year and evaluate the revascularization benefit. The SVS Wifi classification system has been validated in multiple studies with data accrued in nearly 3,000 patients to date, which confirms the SVS Wifi classification's ability to correctly identify the risk of amputation and the need for revascularization (Conte et al., 2019).

Cull et al. (2014) and Zhan et al. (2015) were the initial studies to evaluate the SVS Wifi classification system's validity. Cull et al. (2014) completed a study with 139 patients with foot wounds who underwent lower extremity revascularization. The study concluded as the Wifi clinical stages increase, wound healing and increased amputation decreases.

Zhan et al. (2015) also found a correlation between SVS Wifi classification and outcomes. A total of 201 patients were analyzed and stratified into SVS Wifi clinical stages one through four based on the SVS Wifi classification. The researchers found that as the clinic stage increased, the risk of amputation increased, the one-year amputation-free survival (AFS) decreased, and the wound healing time was prolonged. The study's conclusion supported the SVS Wifi classification's ability to correlate with major amputation risk.

Van Reijen et al. (2019) conducted a systematic review of the evidence on the SVS Wifi classification system's prognostic value in all patient types, diabetic and nondiabetic patients. The review concluded that the likelihood of amputation after one year in patients with CLTI, with or without DM, increased with higher SVS Wifi stages. The results were essential prognostic information and showed the value of SVS Wifi in diabetic and nondiabetic

populations (van Reijen et al., 2019). The SVS Wifi classification system has shown consistent validity in predicting the risk of amputation at one year for patients, in diabetic and nondiabetic patients.

### **Methodology**

This quality improvement project aimed to implement the SVS Wifi classification system for threatened limbs in a local amputation prevention program. This project was declared exempt from the Institutional Review Board at Southern Illinois University at Edwardsville and Southern Illinois Healthcare due to its non-experimental nature, quality improvement design, and absence of patient information.

The SVS Wifi classification system was introduced to the amputation prevention program members, which included cardiologists, wound care specialists, podiatrists, and vascular nurse practitioners in attendance at the monthly committee meeting. Due to COVID-19 pandemic restrictions, this meeting was held virtually. The PowerPoint presented was sent via email to all amputation prevention program members, allowing the members who did not attend the meeting to receive education regarding the SVS Wifi classification system.

The project data collection was two-fold with a chart review and provider survey. A Likert scale questionnaire was given to all committee members after the presentation. The survey was generated using the SurveyMonkey website and a link to access the questionnaire was emailed to the committee members. Survey responses were anonymous. Ten surveys were sent out for response; six were completed, and the responses were analyzed. The 5-point Likert scale survey consisted of six questions.

The questions that evaluated the participant's agreement to a statement included answer options that ranged from strongly disagree (1) to strongly agree (5). When evaluating the provider's perception of the importance of a subject, the options ranged from not at all important

(1) to extremely important (5). A chart review was completed to evaluate the SVS Wifi classification documentation in the CLTI clinic during the study's timeframe.

### **Evaluation**

A two-fold analysis was completed to evaluate the outcome of the DNP project. A chart review was completed from January 25<sup>th</sup> to March 25<sup>th</sup>, 2021, to evaluate the SVS Wifi classification documentation in the CLTI clinic. Twenty-three patients were seen through the CLTI clinic; 14 (60.8%) of those patients' charts had documentation of the SVS Wifi classification.

The survey identified that none of the respondents were "very familiar" with the SVS Wifi classification system before the project implementation. Some providers (66.6%) felt "somewhat familiar", while 33.3% had no prior knowledge of the SVS Wifi classification system. After the education period, the providers were more knowledgeable about the SVS Wifi classification system. When asked if the SVS Wifi classification system would improve assessment and care for their patients, 66.7% strongly agreed.

Current documentation practices were also evaluated. The survey questioned how often the provider used a wound staging or vascular classification system to describe wounds; 33.33% responded "never", 16.67% responded "rarely", 33.33% "occasionally", and 16.67% responded "every time". After the education program, the provider's likelihood of incorporating the SVS Wifi classification system into clinical documentation was evaluated, 50% responded they would "always be likely" to use the SVS Wifi classification system in appropriate patients, 16.67% reported they would "often" incorporate the system, and 16.67% responded "sometimes likely".

The study's limitations include a small sample size of patients and providers and potential negative views by providers on adopting new practices. Additionally, if the vascular

testing is not available to complete the SVS Wifi classification system at the time of the patient's visit, this limits the provider's ability to use the SVS Wifi classification system.

### **Impact on Practice**

The SVS Wifi classification system implementation into the local amputation prevention program allowed for a unified classification system recommended by the Global Vascular Guidelines (GVG). This improved communication throughout the specialties involved in the amputation prevention program providing for less fragmented care and similar vernacular by all providers. The providers also gained knowledge of the SVS Wifi classification system and its ability to improve patient assessment and triage. There was also increased documentation of threatened limbs using the SVS Wifi classification system in the CLTI clinic. Provider and patient discussion regarding the risk of amputation and the benefit of revascularization was also improved with using the clinical stages of the Wifi classification system.

### **Conclusions**

This DNP project demonstrated the successful implementation of the SVS Wifi classification system into the local amputation prevention program. Given the increased number of patients presenting with complex foot ulcers requiring multidisciplinary care, the classification system addressed all aspects of wound healing and included patients with DM. Incorporating a unified classification system throughout amputation prevention programs is essential in the management and continued treatment of complex patients to help decrease the risk of amputation.

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