Conservative Sharp Wound Debridement by Nurses in the Outpatient Management of Diabetic Foot Ulcers: Safety, Efficacy, and Economic Analysis

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Introduction/Purpose: With approximately 29.1 million diabetics in the United States and estimated total annual cost of $245 billion, diabetes and its associated complications continue to be an increasing burden on society. The management of diabetic foot ulcers accounts for a significant portion of those expenses. We propose a safe, efficacious and economically prudent model for the outpatient treatment of uncomplicated diabetic foot ulcers.

Methods: Enrolled patients had initial sharp wound debridement by one of two foot and ankle fellowship trained orthopaedic surgeons. Patients were treated with total contact casting and subsequently evaluated every two weeks by nurses who utilized a clinical management algorithm and performed conservative sharp wound debridement (CSWD). Results of healing and complications were recorded. Digital photographs of the ulcers from each clinical encounter were retrospectively reviewed in a blinded fashion by two orthopaedic foot and ankle surgeons and compared to the nursing decisions at the time of treatment. Financial calculations estimated the potential cost savings by having nurses perform CSWD. State boards of nursing were systematically surveyed to assess current policies related to CSWD.

Results: Average time to clinical healing was 6.03 weeks. There were no identified complications of CSWD performed by nurses. The sensitivity for the timely identification of wound deterioration was 100%, specificity = 86.49%, PPV = 68.75% and NPV = 100% with an overall accuracy of 89.58%. Thirty-six of 51 (70.59%) state boards of nursing responded to the survey with 33 of 36 (91.67%) defining CSWD as within the nursing scope of practice. The estimated cost savings by having nurses perform CSWD over a 6 week treatment period, with all other factors being equal, was $774.60 per patient. When extrapolated to the estimated number of diabetic foot ulcers annually within the United States, this could approach $1.8 to $2.1 billion in potential annual healthcare savings.
Conclusion: CSWD of diabetic foot ulcers and calluses by trained nurses is a safe, effective and fiscally responsible clinical practice supported by greater than 90% of state boards of nursing. Utilizing a clinical decision algorithm, nursing evaluation and appropriate referral of ulcers at risk demonstrated 100% sensitivity and 89.58% accuracy. There were no complications associated with nurses performing conservative sharp debridement. When considering the most recent CDC estimates of 29.1 million diabetics with an 8% annual incidence of DFU, implementation of this clinical model on a national scale could result in approximately $2 billion in annual healthcare savings.