A recent development in wound care – negative pressure wound therapy (NPWT) – is surfacing as a possible therapy for diabetic wounds secondary to amputation.\(^1\)

NPWT systems create a moist environment for wound healing. The technology consists of a pump that applies intermittent or continuous subatmospheric pressure to the wound; a canister that removes wound exudates and excess fluid; and a dressing that isolates the wound. The two most common NPWT systems in the United States are the Vacuum Assisted Closure (VAC) Therapy System (KCI USA, San Antonio) and the Versatile 1 Wound Vacuum System (V1, Blue Sky Medical, Carlsbad, Calif).\(^2\)

In the United States, both systems are covered under Centers for Medicare and Medicaid Services (CMS) reimbursement coding (HCPCS code E2402) for use in NPWT. However, they are significantly different, according to David G. Armstrong, DPM, PhD, who spoke with DIABETIC MICROVASCULAR COMPLICATIONS TODAY in an interview. The VAC system is a wound-healing device and the V1 is a drainage system. “Most people have not heard of or used the Blue Sky device. I have, and these two devices could not be more different,” he said.

**FDA APPROVAL**

In 1995, the VAC system was first to be approved by the Food and Drug Administration (FDA) for NPWT (Figure 1). On its Web site, KCI claims that the VAC device promotes wound closure and tissue growth by applying negative pressure via dressings on the wound cavity or over a flap or graft.\(^3\) One benefit of the VAC is the material of the dressing, Dr. Armstrong said, because it promotes a protective environment for wound healing. Pressure is localized to the wound site and margins.

According to the company, the VAC Therapy System can be used on patients who benefit from subatmospheric pressure and the removal of infectious material and fluids from the wound. It is indicated for use in patients with diabetic ulcers, chronic open wounds, pressure ulcers, acute and traumatic wounds, flaps and grafts, dehisced wounds and partial-thickness burns. Patients with untreated osteomyelitis, wound malignancy, nonepithelial and unexplored fistula or necrotic tissue with eschar should not receive NPWT.

The Versatile 1 drainage system uses a piston and suction system to apply localized negative pressure to the wound.\(^4\) While there are no peer-reviewed published data to support the device’s efficacy, the system carries a claim for wound healing and wound drainage. According to a 2004 company news release, the V1 is FDA approved for marketing, with the indication that the device “may promote wound healing.” It was added to the CMS reimbursement category in October 2005. The V1 system may also be used for other suction needs, according to the company. It was recently displayed at Medica Germany (The 37th World Forum for Medicine International Trade Fair with Congress, Dusseldorf, Germany) to increase international interest.
Complex lower extremity wounds, which may be some of the most difficult to treat wounds, require substantial care and attention in order to heal. The size and extent of a complex wound is devastating; it is usually large and deep with bone and tendon exposure.尽管标准的伤口护理（即，去腐和压力卸载）对许多糖尿病足部伤口都存在高并发症率和低愈合反应。尽管先前的伤口护理技术也已使患者经历并发症。

在The Lancet中，Armstrong和Lavery假定，NPWT与VAC系统相结合将产生更好的愈合反应。先前的研究已经调查了VAC-NPWT与标准护理一起使用的积极结果，以及有至少150和200个被审查的评估伤口使用VAC的文献参考。Armstrong医生说数据支持使用V1排水系统不像是多元或充足的。

NPWT是一个新的伤口治疗选项，可能产生积极的结果。对于糖尿病伤口的使用其复杂性是引人注目的。从KCI，制造商的VAC。

CLINICAL TRIAL

所有患者有糖尿病，年龄超过18岁，并且有一个伤口，结果是需要截肢，如分类为University of Texas等级（2或3）。伤口被评估了给定的数字图像在基线和在一周1, 2, 4, 6, 8, 12和16。患者中谁在完成伤口愈合，那些谁收到NPWT在更短时间内（中位时间闭合56天对77天，P=0.005）和在更大频率（56%对39%，0.1702，95%置信区间，0.0184-0.322）。

11%的患者在标准护理组和3%的NPWT组有第二次截肢。这不是一个重要的差异，Drs. Armstrong和Lavery报告。然而，“它建议，NPWT（P=0.06）...指示，即使NPWT的患者期望是现在的，如控制患者需要第二次截肢。”

基底组织也被评估，基线19名NPWT患者和15名标准护理患者有0%到10%的基底组织。中位时间为基底组织的治疗组76%到100%是42天并且84天，分别。Drs. Armstrong和Lavery的结论是，一个原因对较低的截肢率在治疗组就是由于基底组织时间的NPWT。

NPWT是一个新的伤口治疗选项，可能产生积极的结果对于治疗糖尿病伤口。其复杂性使用VAC系统是令人信服的，如从结果与VAC的系统。使用时要谨慎，然而，当选择合适的装置，Dr. Armstrong说。

David G. Armstrong, DPM, PhD,是教授的手术和施氏的中心的足部外科的美国足部中心，Rosalind Franklin大学的医学和科学，休斯敦。他可以被达到Armstrong@usa.net。

Lawrence A. Lavery, DPM, MPH,是来自的外科，Scott和White医院，Texas A&M大学的健康科学中心的足部医学，Temple, Texas。他可以被达到LLLAVERY@swmail.sw.org。

Drs. Armstrong和Lavery有收到研究授予KCI，制造商的VAC。