The use of bioengineered tissue and topical subatmospheric pressure therapy have both been widely accepted as adjunctive therapies for the treatment of noninfected, nonischemic diabetic foot wounds. This article describes a temporally overlapping method of care that includes a period of simultaneous application of bioengineered tissue (Apligraf, Novartis Pharmaceuticals Corp, East Hanover, New Jersey) and subatmospheric pressure therapy delivered through the VAC (Vacuum Assisted Closure) system (KCI, Inc, San Antonio, Texas). Future descriptive and analytic works may test the hypothesis that combined therapies used at different and often overlapping periods during the wound-healing cycle may be more effective than a single modality. (J Am Podiatr Med Assoc 92(7): 395-397, 2002)
granular wounds, this initial preparatory therapy can be eliminated. Once a healthy, granular bed is encountered, the wound is ready for combined subatmospheric pressure and bioengineered tissue therapy.

Following application of meshed bioengineered tissue, the grafted site is covered with a permeable, nonadherent dressing such as the silicone-impregnated dressing Mepitel (Mölnlycke Health Care AB, Göteborg, Sweden) or the petrolatum-impregnated dressing Xeroform (Sherwood Medical, St Louis, Missouri). The subatmospheric pressure dressing is then applied to the primary dressing. The sponge is cut to ade-

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**Figure 1.** Bioengineered tissue (Apligraf) meshed prior to application to reduce risk of seroma formation.

**Figure 2.** A, White, soft polyvinyl alcohol foam (generally preferred for superficial wounds) as packaged; B, foam cut to fit over nonadherent dressing covering bioengineered graft.

**Figure 3.** Hose inserted into foam and clear, occlusive dressing applied to entire dressing construct.

**Figure 4.** Successful vacuum seal over the VAC/Apligraf dressing.
Figure 5. Example of VAC dressing applied with secondary cover dressing. The vacuum hose should be positioned to reduce the risk of iatrogenic damage to the plantar aspect of the foot or the patient should be kept strictly nonweightbearing over the affected area.

adequately cover the graft tissue and nonadherent dressing. In the opinion of the authors, the white foam supplied by the VAC manufacturer, which is thinner and less porous than the standard black, open-cell foam, often has better efficacy in this application.

The sponge and primary dressing construct is then covered and draped with the occlusive drape supplied with the VAC device. Subsequently, a vacuum line is inserted through a small perforation made in the occlusive cover and shallowly inserted into the sponge. The perforation is sealed with additional occlusive dressing and the vacuum line is connected to the wound vacuum device. The wound vacuum is typically operated at a reduced continuous pressure setting of 100 to 125 mm Hg, instead of 125 to 150 mm Hg, when used in conjunction with graft tissue.

The wound vacuum is operated for 72 to 96 hours, with periodic checks of the fluid canister and assessments for leaks in the occlusive dressing or other complications. The VAC dressing is removed 3 to 4 days after the initial dressing, but the contact layer of the dressing is not disturbed. The wound is redressed as described above and the dressings are changed (again, leaving the contact layer intact) at 2-day intervals. At 7 to 10 days following the initial procedure, the VAC and contact layer of the dressing are carefully removed and the wound is inspected. Generally, VAC therapy is discontinued in favor of a less robust, moist dressing.

Conclusion

A novel application of two advanced wound-healing modalities used in a temporally overlapping manner has been presented. In the opinion of the authors, intelligent, judicious use of a variety of therapies at different times in the wound-healing cycle may lead to more predictable outcomes. Future research in this area may consider the use of surrogate end points, rather than simply time to healing, which can better assess specific attributes of advanced wound-healing modalities that may lead to a stronger evidence basis for care.

References