Key Points:

- Negative pressure wound therapy (NPWT) involves creating an air-tight seal around a wound and applying a vacuum to the tissues within that seal.
- NPWT promotes healing by altering blood flow, reducing edema, removing inhibitory mediators, managing infection, drawing wound edges together, and stimulating granulation.

Negative pressure wound therapy involves creating an air-tight seal around a wound and applying a continuous or intermittent vacuum to the underlying tissues, changing the dressing every 2 to 3 days. It is regularly used in people for acute and chronic wounds, skin grafts and flaps, septic peritonitis, and closed incisions at risk dehiscence; use in the veterinary profession is steadily increasing. NPWT promotes healing by a number of mechanisms, as described below.

**Blood flow:** NPWT induces a change in microvascular blood flow in and around the wound. Findings vary depending on the method used to measure perfusion, pressure applied, distance from the wound edge, tissue type, and degree of vascular compromise. Blood flow can decrease when negative pressure exceeds a certain level. Because of these variables, it may be most appropriate to choose an NPWT pressure setting that reflects the characteristics of the wound being treated rather than using the same setting for all wounds.

**Reduce edema:** NPWT may decrease edema by increasing blood flow velocity, thus decreasing hydrostatic pressure and drawing more extracellular fluid into the vessels. Tissue compression by NPWT may also push fluid out of the interstitial space. Edema reduction increases microvascular blood flow and improves nutrient diffusion in the interstitial space.

**Remove inhibitory mediators:** By decreasing the disproportionately high levels of matrix metalloproteinases and inflammatory mediators in chronic wound fluid, NPWT helps chronic wounds finally move from the inflammatory phase into the repair phase of healing.

**Manage infection:** NPWT can be used in infected wounds when combined with debridement and antibiotics. NPWT may help control infection by removing fluid that harbors bacteria, increasing oxygen used for bacterial killing, improving antibiotic penetration, providing a moist environment that supports white blood cell function, and maintaining a closed system. NPWT stretches cells and the extracellular matrix, altering the configuration of the cytoskeleton and the molecules that anchor cells to the matrix. This causes the release of intracellular messengers that stimulate cell proliferation and synthesis of growth factors and matrix molecules. In this way, NPWT stimulates granulation and angiogenesis.