Foam dressings are highly absorbent and are available in a range of different shapes, sizes and compositions. They can be used as a primary or secondary dressing on a variety of wound types, from leg ulcers to cavity wounds where exudate is a problem.

HISTORY OF FOAM DRESSINGS

Foams were one of the first 'modern' dressings to be used in wound management and became widely available in the mid-1970s for lightly, moderately or heavily exuding wounds. Foams offer advantages over traditional gauze dressings as they do not shed particles and can be left in place for several days without causing maceration [1].

Foams closely comply with Turner's criteria for the ideal dressing. He described the properties of such a dressing as the ability to:

- Remove excess exudate and toxic components
- Maintain high humidity at the wound/dressing interface
- Permit gaseous exchange
- Provide thermal insulation
- Protect from secondary infection
- Protect from particulate or toxic contamination
- Allow removal without trauma at dressing changes [2].

Majno describes how, in ancient Greek and Roman medicine, sea sponges were used to absorb fluid from wounds. These were also soaked in wine and used as an antibacterial wound dressing [3].

The first commercial 'foam-like' wound dressing was an artificial medicated sponge manufactured by Burroughs Wellcome & Co in the 1880s for the surgeon Joseph Gamgee. This was made from gauze, cotton and coconut fibre, and had a centre capsule containing an antiseptic [4].

Today, foam dressings are available in various forms. Topical wound dressings come in a range of sizes and as sheets, with or without adhesive borders. Foam dressings are available for cavity wounds and are used as a dressing medium in negative pressure wound therapy (V.A.C.@ Therapy, KCI; Renasys-EZ, Smith & Nephew). In addition, foam is used in pressure-reducing devices such as mattresses and heel protectors.

Foams are recommended for wounds producing low, moderate to heavy exudate, including leg ulcers,
DEFINITIONS, CHARACTERISTICS AND ACTIONS

Although many dressings are classified as a 'foam' there are differences in the chemical makeup of different dressings. It is therefore important that clinicians know whether the dressing they are using is a 'true foam' that draws fluid into air spaces or a 'pseudo-foam' that draws in fluid and physically expands as it retains it.

True foams

True foams are soft, open-cell hydrophobic and hydrophilic (see Glossary), non-adherent dressings that have single or multiple layers. The surface of the dressing is hydrophilic and is placed against the wound to allow exudate to pass through. The main structure of the dressing is hydrophobic, which allows fluid to be held within the dressing.

The mode of action of true foams is to draw fluid into the air spaces by capillary action. The fluid is then held within the structure, although in some dressings a small amount of fluid may pass through the structure and disperse by evaporation.

True foam dressings have the following broad characteristics. They:

- Are absorbent and allow the passage of exudate through the non-adherent surface to be absorbed in the main body of the product
- Maintain a moist environment as the contact material is hydrophilic, which allows exudate to be absorbed from the wound surface
- Provide thermal insulation to the wound
- Provide cushioning and comfort in situ
- Are non-residual in that they do not break down and release particles into the wound
- Are non-occlusive and gas-permeable owing to their open cell structure [4,5,6].

True foams can be composed of polyurethane or silicone, as described below.
Polyurethane foam dressings

The first foam dressings attempted to mimic the action of the sea sponge, using a polyurethane construction that contained many air spaces. Lyofoam (Mölntlycke HealthCare) was the first polyurethane foam dressing to be developed in the 1970s [4].

Polyurethane foam dressings can be used as topical dressings and cavity wound dressings. Cavity wound dressings are available in pre-formed shapes – either circular or sausage-shaped – for use in cavity wounds. They contain chips of foam encapsulated within a layer of thin, conformable, perforated polymeric film.

Exudate passes through the outer layer and is held within the foam chips (eg Allevyn Cavity devices, Smith & Nephew) [4]. In addition, some foam dressings have an adhesive frame, which provides a waterproof backing (eg Allevyn Adhesive, Smith & Nephew; Lyofoam Adhesive, Mölnlycke HealthCare; Tegaderm Foam Adhesive Dressing, 3M) and there are also charcoal-impregnated foam dressings, such as Lyofoam C (Mölntlycke HealthCare) [5,6].

A polyurethane foam dressing is also used as part of the structural components of a negative pressure wound therapy system (V.A.C.® Therapy, KCI). These foams are available in two forms, dependent on the wound type. The black foam (V.A.C.® GranuFoam, KCI) is composed of a polyurethane foam with a hydrophobic, reticulated open-cell structure (400 to 600 μm). This affords uniform distribution of negative pressure and is used in highly exuding wounds and deep cavity wounds [7].

The white foam (V.A.C.® WhiteFoam, KCI) is composed of a polyvinyl alcohol foam, with a hydrophilic (saline moistened), non-reticulated, higher-density cell structure (200-1000 μm). This foam type prevents granulating skin tissue growing into the dressing and is easier to handle when placing in and removing from tunnels and small cavities because of its high tensile strength. It is non-adherent, prevents damage to the periwound skin on removal, and promotes graft survival [7].

A number of foam and foam-like dressings incorporate silver into the foam structure and release various levels of silver into the wound and/or hold the silver within the structure of the foam to kill bacteria as they are absorbed (eg Acticoat Moisture Control, Smith & Nephew; Allevyn Ag, Smith & Nephew; Mepliex Ag, Mölnlycke Health Care; Contreet, Coloplast; Biatain Ag, Coloplast).

Silicone foam dressings
Silicone foam dressings were first developed in the 1950s and were mostly used in pilonidal sinus cavity wounds [4].

Silastic foam (Dow Corning) was introduced in the 1970s and comprises a two-component product presented as two separate liquids, a polymer and a catalyst. When mixed together and poured into a cavity wound, they react, releasing heat and expanding to form a more solid structure that conforms to the shape of the cavity. Silastic foam is able to expand to about four times its original volume. The dressings are able to absorb exudate into the air spaces within the structure in a similar manner to other foam dressings.

The first cavity foam dressings required daily removal. These were then decontaminated with an aqueous antiseptic solution such as chlorhexidine, rinsed and replaced in the cavity. The product was used in this manner for about seven days and then replaced with a newly-formed foam as the cavity contracted in size.

Modern products are easier and quicker to prepare and can remain in situ for up to a week. Cavi-Care (Smith & Nephew), for example, is a version of the silastic foam used in post-pilonidal sinus excision and in some types of dehisced surgical wounds.