ALLEVYN◊ LIFE Foam Dressing distinct mechanism of action (MOA) absorbs mechanical energy through frictional sliding and internal shear of independent layers, helping reduce energy transfer to soft tissues to provide pressure injury prevention (PIP)

Marché C, Creehan S, Gefen A. The frictional energy absorber effectiveness and its impact on the pressure ulcer prevention performance of multilayer dressings. *Int Wound J.* 2024;21(4):e14871.

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Key points

Laboratory findings

30–45% absorption of mechanical energy by ALLEVYN LIFE Dressing

Absorption of mechanical energy likely increases with wear time of ALLEVYN LIFE Dressing

Clinical finding

Clinical evidence aligns with laboratory findings, indicating **enhanced PIP efficacy** of ALLEVYN LIFE Dressing*

*When used in combination with a standard PIP protocol, compared to standard PIP protocol alone.

ALLEVYN LIFE Dressing

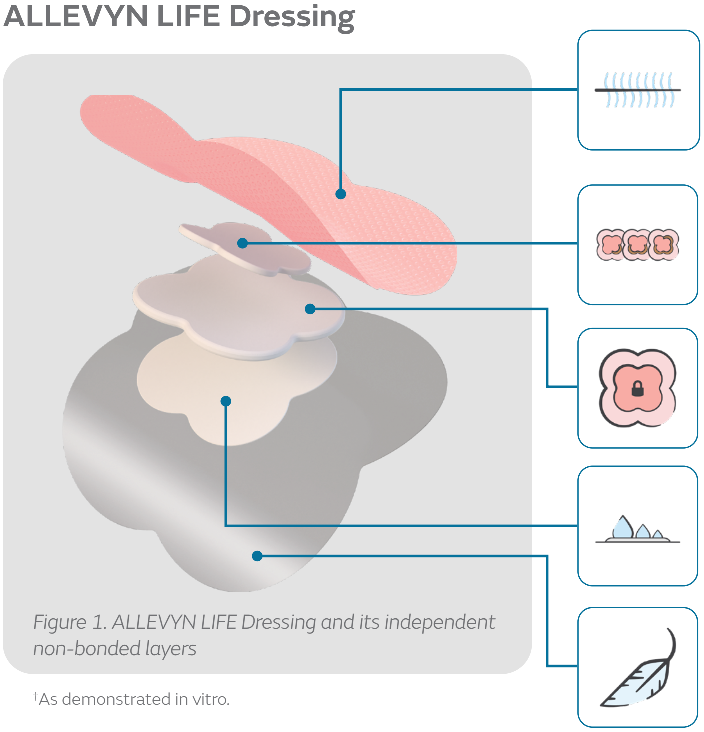

Figure 1. ALLEVYN LIFE Dressing and its independent non-bonded layers

†As demonstrated in vitro.

Breathable top film layer[1,2]
- Low coefficient of friction, reducing the generation of shear forces already at the external surface of the dressing[3]

EXUMASK◊ Masking Layer
- Allows the dressing to move, which can prevent the patient's skin from moving, so friction and shear forces are absorbed by the dressing[†4]
- Not attached to the EXULOCK Layer

EXULOCK◊ Advanced Lock-In Technology
- Freely moves within the dressing that can help absorb friction and rubbing during patient movement[†4]
- Redistributes pressure and provides most of the cushioning[†5]

Absorbent hydrocellular foam layer[6,7]
- Not attached to the EXULOCK Layer
- Allows the inside of the dressing to move, helping to absorb friction and rubbing[†4]
- Helps to remove moisture from the skin surface[†3,8]

Gentle silicone wound contact layer[8–10]

Overview

- Unique test apparatus was used to capture optical measurements of frictional sliding displacement (Figure 2) of the independent, non-bonded layers of ALLEVYN LIFE Dressing
  - A novel metric, frictional energy absorber effectiveness (FEAE), was used to quantify the internal amount of energy dissipated due to the frictional sliding of ALLEVYN LIFE Dressing layers
- To provide clinical context to the FEAE results obtained, a review of current clinical literature on prophylactic use of ALLEVYN LIFE Dressing for PIP was performed[11–13]
  - A total of three randomized controlled trials (RCT) were identified and reviewed
- Standard ALLEVYN LIFE Dressings were utilized during testing, comparisons were also made with 'used' and specially prepared bonded variants
  - A 'used' status was achieved by applying loading cycles to simulate the repetitive shear and compression that would be exerted by bodyweight and potential leg movements of a patient in one week
  - Bonded variants of ALLEVYN LIFE Dressing did not have independent layers, reducing the ability for internal frictional sliding of dressing layers

Laboratory results

- FEAE analyses showed that frictional sliding and internal shear of ALLEVYN◊ LIFE Dressing independent layers absorbs 30–45% of mechanical energy
  - Absorption of mechanical energy within the dressing layers helps reduce the total energy transferred to soft tissues
- In variants of ALLEVYN LIFE Dressing pre-conditioned to be in a 'used' status, the FEAE increased by 1.3-fold due to increased frictional sliding and internal shear of dressing layers (p=ns)
  - These results indicate that dissipation of mechanical energy by ALLEVYN LIFE Dressing likely increases with wear time
- Internal displacement of energy is substantially reduced in variants of ALLEVYN LIFE Dressing with bonded layers
  - Frictional sliding of independent layers in the commercially available ALLEVYN LIFE Dressing accounts for 69% of all energy displacement
- The shape and size of the ALLEVYN LIFE Dressing used has no significant effect on the FEAE and the ability to absorb mechanical energy (p=ns)

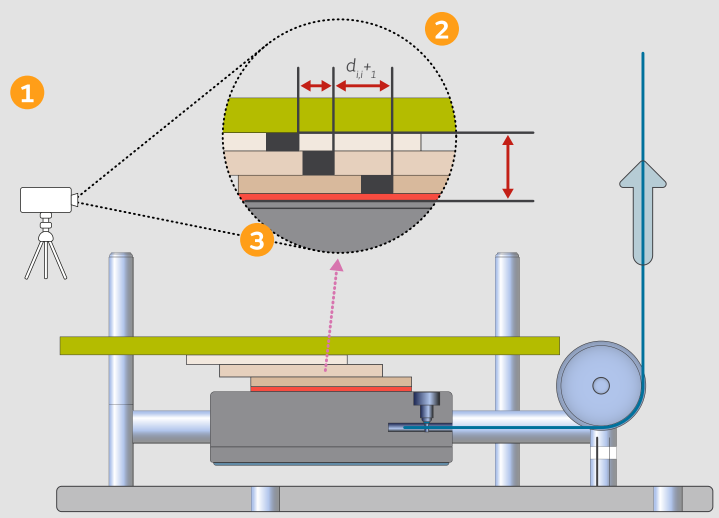

Figure 2. High-resolution camera (1) recorded displacement of independent dressing layers from original positioning (2), while unique test apparatus recorded alterations in mechanical energy pressure (3)

Clinical results

Three published RCTs investigated the prophylactic performance of ALLEVYN LIFE Dressing.[11–13] Findings of these RCTs indicate that use of ALLEVYN LIFE Dressing in combination with a standard PIP protocol is capable of significantly reducing the incidence of category II and above pressure injuries, compared to standard PIP protocols alone ($p<0.05$). This alignment of the laboratory FEAE findings with the clinical literature demonstrates the enhanced PIP clinical efficacy of ALLEVYN LIFE Dressings, when used in combination with a standard PIP protocol compared to standard PIP protocol alone.

Conclusions

Application of ALLEVYN LIFE Dressing effectively absorbs mechanical energy internally, through combination of material shear and frictional sliding of its independent non-bonded layers, helping reduce energy transferred to soft tissues. The laboratory testing suggests that the ability of ALLEVYN LIFE Dressing to absorb mechanical energy likely increases with wear time and use, while shape and size of the dressing has no significant impact on ability. Additionally, bonded dressing variants had reduced mechanical energy absorption compared to ALLEVYN LIFE Dressing with independent non-bonded layers.

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