

# Fuzzy Wale Compression (FWC) Stockinet Delivers Positive Pressure Wound Therapy (PPWT™)

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## Abstract

**Background:** Compression is the cornerstone in the management of venous leg ulcers (VLU) and edema of multiple origins.<sup>1,2</sup> Historically, compression dosage (mmHg) and gradience have been the principal determinates of therapeutic benefit of a compression application.<sup>3</sup> New research demonstrating a third dimension, pressure distribution across the tissue/wound, has unlocked a new perspective of the 'how' compression reduces edema and impacts wound healing.<sup>4</sup>

A novel textile, Fuzzy Wale Compression Stockinet (FWCS), *in vitro* produces longitudinal vertical distribution of pressure with alternating areas of little or no compression pressure, delivers compression pressure to only 20% of the total area over which the compression is being applied. This in contrast to the more uniform distribution of traditional compression applications which apply compression to 100% of the skin surface.<sup>4</sup> *In vivo*, FWCS creates furrows in subcutaneous fat, enhancing edema management, and wound edge migration, subsequently accelerating wound healing.

**Method:** A case series (n=5), with photos before and after, clearly demonstrating the tissue deformation produced and clinical healing progress that followed the incorporation of the augmented compression textile as a direct interface with wound. Details of each case including comorbidities, previous treatment interventions, and detailed explanation of treatment application will be included.

**Conclusion:** Local factors that can affect wound healing are pressure, tissue edema, hypoxia, infection, maceration and dehydration.<sup>5</sup> The authors postulate that the utilization of the FWCS as a wound contact layer delivers positive pressure wound therapy (PPWT)®, analogous to negative pressure wound therapy (NPWT). Both modalities deliver physiologic cell micro-distortion which has been cited to signal DNA to synthesize the many proteins necessary to clear dermatitis and heal wounds.<sup>6,7</sup>

\*Positive Pressure Wound Therapy (PPWT)™ Suzie Ehmann, Albemarle, NC

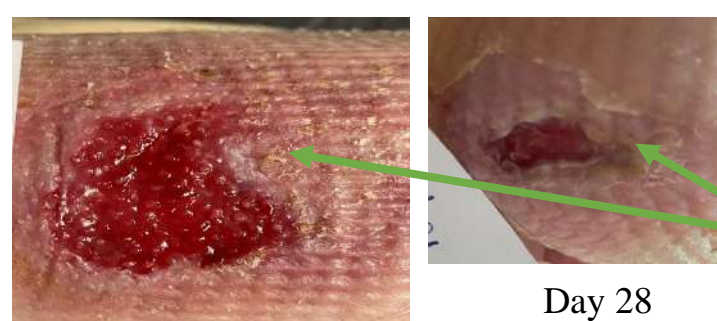
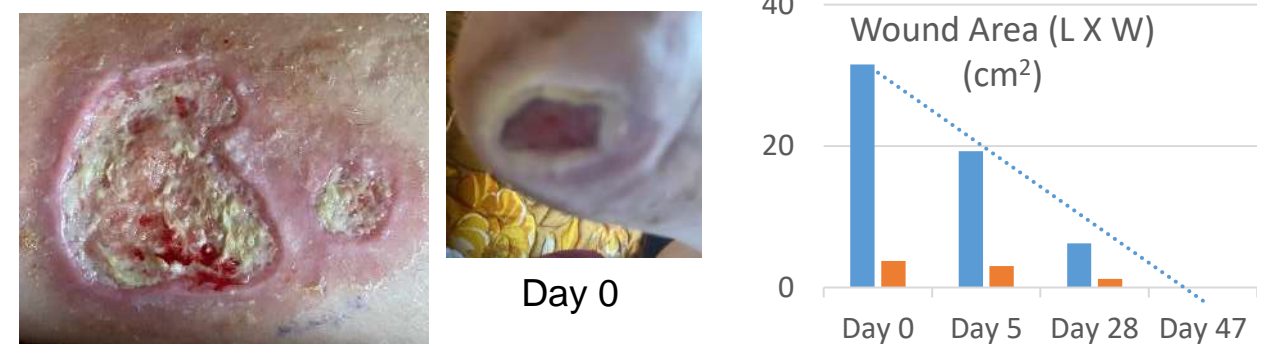
\*\*EdemaWear®, Compression Dynamics LLC, Omaha, NE 68120

## Case 1<sup>3</sup>

**HPI:** 72 y/o male presented with a stage IV PI L heel ulcer which had been present for 5mo, and a left leg ulcer which developed 3mo prior.

**PMH:** CHF, HTN, CVA – non-ambulatory/dependent for all transfers, DM, neuropathy, (+)tobacco

- Previous treatments including NPWT, debridement, offloading and topical dressings including both honey and silver creams/gels.



Note the dramatic reduction in wound volume with initiation of PPWT

Note 'scalloped' healing edge to wound post inclusion of PPWT

**Treatment:** FWC direct wound interface → collagen, absorptive pad, multilayer compression application

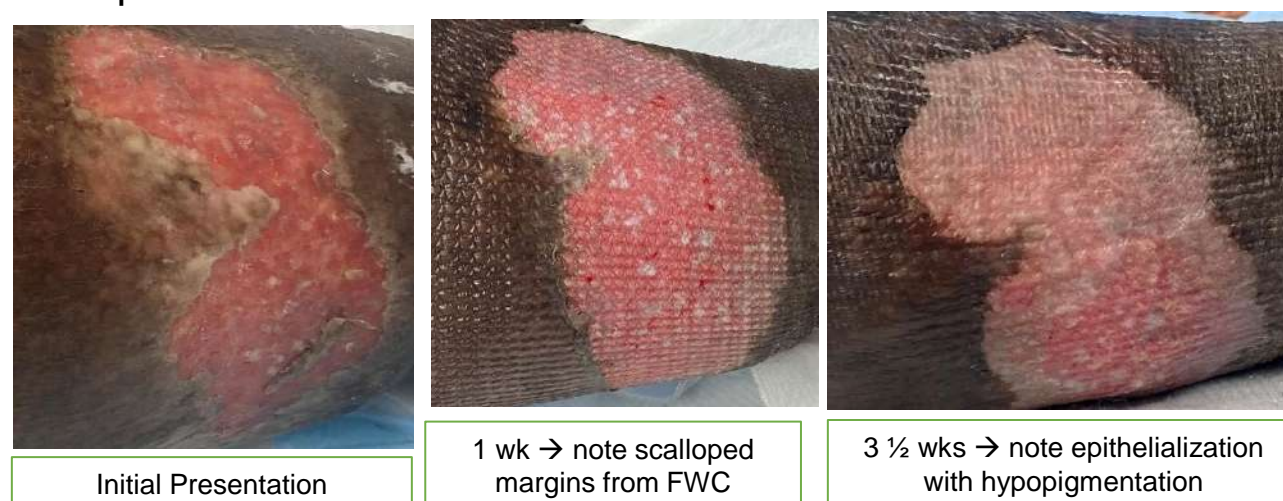
## Case 2<sup>1</sup>

**HPI:** 58 y/o male presented with non-healing ulcerations bilateral LE. Wounds had copious exudate.

**PMH:** obesity, DM, HTN, PVD, CRD on HD.

-previous treatment included standard of care compression and alginate; exudate soaking through dressings in a 2 day time period.

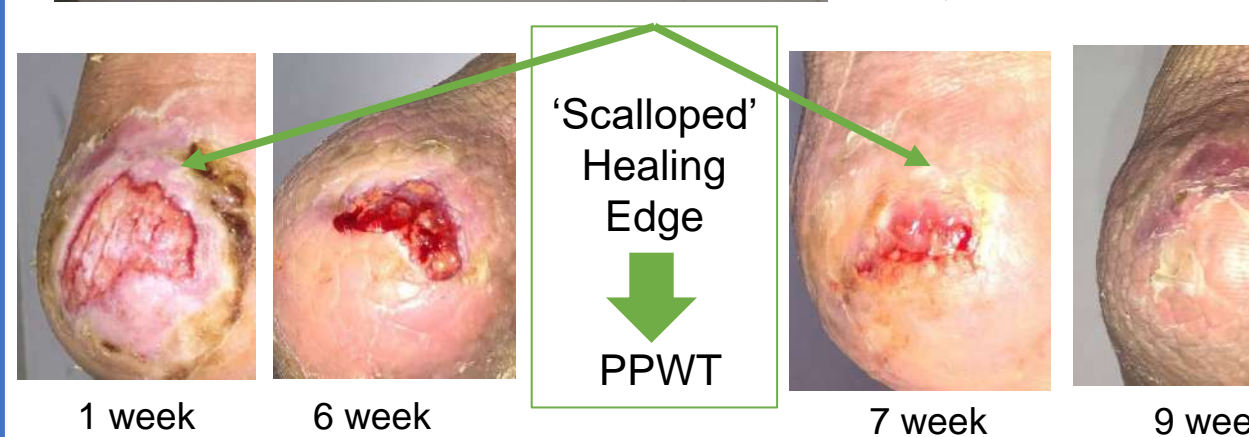
**Treatment:** FWC direct wound interface (a) → AFM → ABD pad. Toe bandage applied f/b two layer cohesive compression wrap (b) as depicted. Pt seen 2x/wk til wound closure at 4 wks



## Case 3<sup>1</sup>

**HPI:** 75 y/o male presented with stage III PI left heel sustained during extended ICU stay r/t CHF exacerbation.

**PMH:** obesity, DM, recurrent DFU r/t Charcot joint and ill fitting orthosis required for weight bearing, CVD, Lymphedema bilateral LE managed with custom flat knit garments.



**Treatment:** FWC direct wound interface → AFM → dry gauze → 2-layer cohesive; Pt seen 2x/wk for first 4 wks, then weekly.

## Case 4<sup>1</sup>

**HPI:** 77 y/o male with PAD, not a surgical candidate, presents with chronic LE ulceration dorsum of foot resulting from a trauma. Wound is worsening over the last 3mo

**PMH:** PAD (ABI 0.6, 70% occlusion of Tibial Artery), HTN, DM, CAD, A-fib, CHF, h/o DVT left LE, non-ambulatory/transfers only, lymphedema B/L LE

**Previous Treatment:** Unna Boot – patient did not tolerate d/t 'pain', wrap 'cutting into' leg causing patient to remove.

**Treatment:** FWC direct wound interface → AFM → dry gauze → Kling; multi-component lymphedema wrap. Patient seen initially 3x/wk for 2 wks, then reduced to 2x/wk. Continued to wound closure at 45 days.

Note improved appearance of wound with adequate compression



**Standard of care – Unna Boot** vs **Multi-component lymph wrap** vs **'Augment' compression with addition of FWC to multi-component lymph wrap consisting of open cell rolled white foam and 4 short stretch compression bandages..**

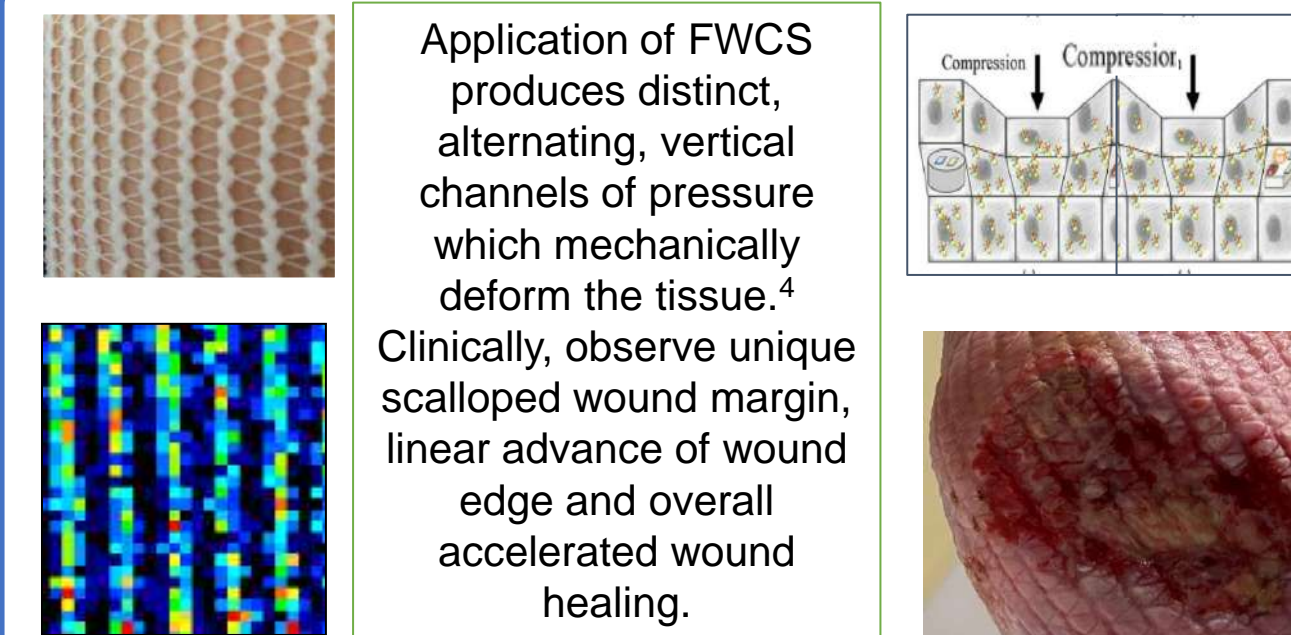
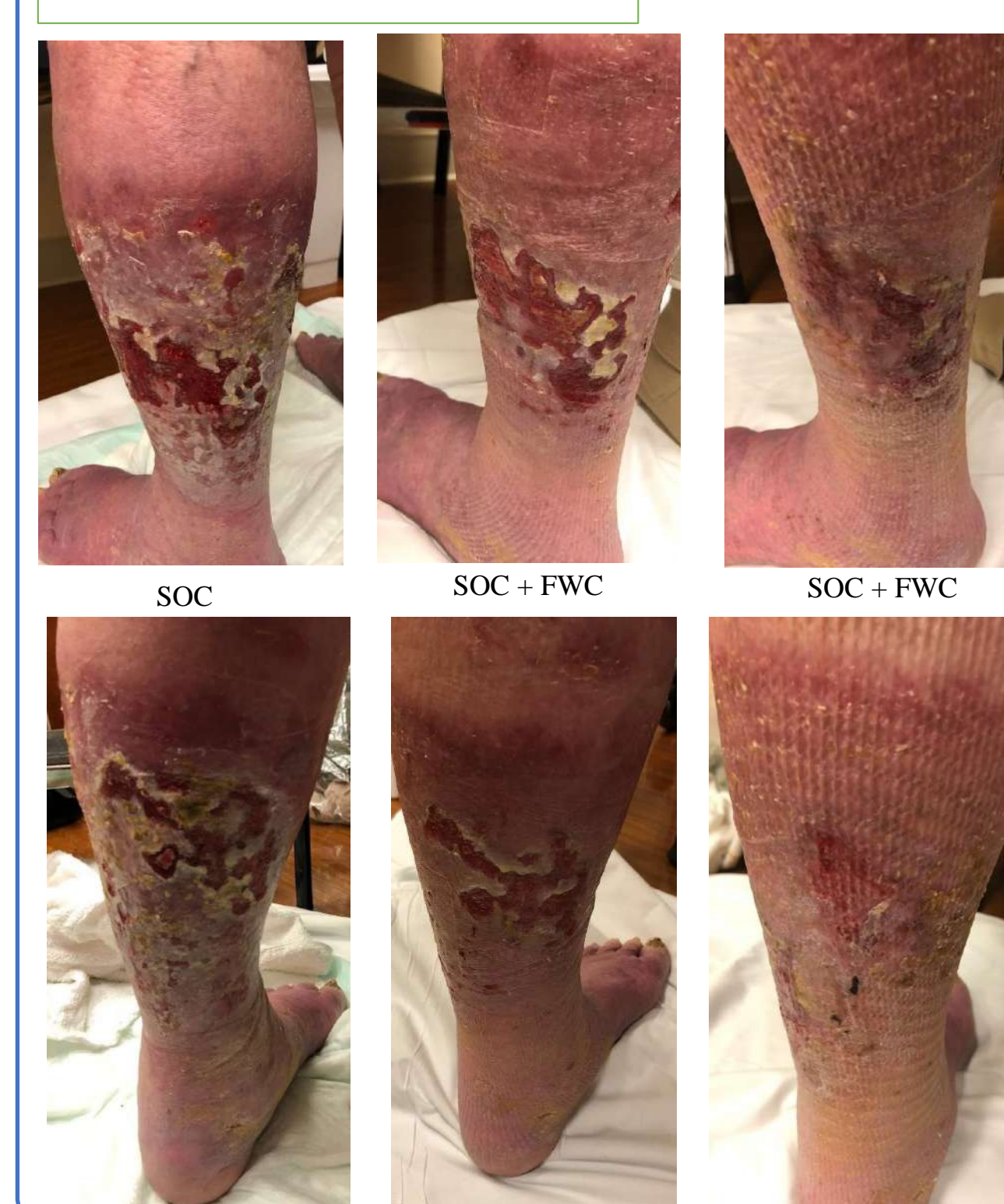
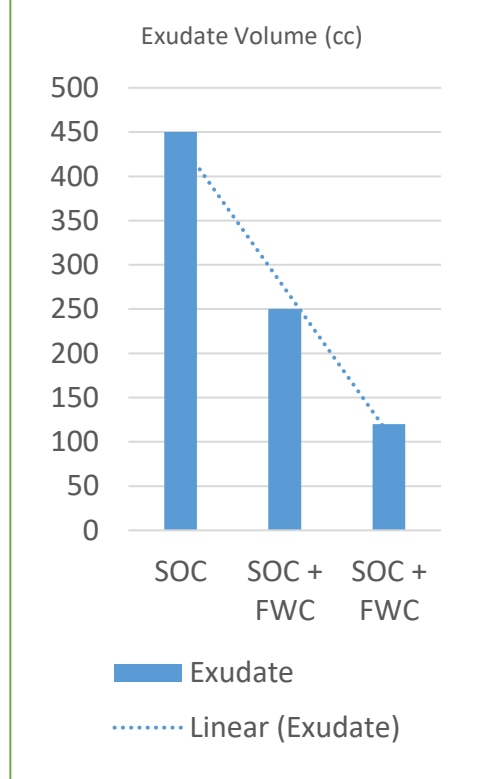
## Case 5<sup>2</sup>

**HPI:** 81 y/o female with h/o progression LE ulcerations, with copious drainage, both LE x 3mos.

**PMH:** CVD, Afib, HTN

-previous treatment include absorbent dressing and multi-component lymph wrap. NPWT initiated with the multi-component lymph wrap applied over the NPWT dressing. This was continued for 3mos at which time the change in the wound healing stalled.

**Treatment:** Standard of care (SOC) included NPWT → with multi-component lymphedema wrap consisting of rolled white foam and four short stretch compression bandages. When the wound healing stalled, FWC was applied over NPWT dressing → continued with multi-component lymphedema bandage. After 3 applications of augmented compression, the exudate reduced to <120cc. The NPWT d/c. FWC was applied direct wound interface → AFM → ABD pad → kling → multi-component lymphedema wrap. This was continued until wound closure.



## Take Away Message

- Enhanced compression prescription is more than dosage (mmHg) on a length and width of body surface. Compressing just 20% of the wound surface creates a third dimension, vertical furrows in subcutaneous fat and granulation tissue.
- FWCS is an elastic compression stockinette that produces unique longitudinal furrows in the subcutaneous fat, creating patterns of alternating high and low (or no) channels of pressure
- FWC is an elastic stockinette that when worn alone produces 8-10mmHg compression.
- Combination of FWC and other forms of compression produces statistically higher IP.<sup>4</sup>
- Combination of FWC with other forms of compression harnesses both macro- and micro-vascular benefits of compression.

## References

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