

## Introduction

Cancer diagnosis and subsequent treatments induce a set of symptoms and problems specific to each individual experiencing the disease trajectory. Intensity of cancer treatments can have major implications in relation to formation of wounds and woundcare management, leading to problematic long-term care.<sup>(1)</sup> Sharing best practice is crucial.

During 2021 our tissue viability service received a referral increase of 94.4% for advice and support for long standing and complex oncology wounds (unpublished data). The reason for this 94.4% increase is not known. This may be chance, or due to the Covid-19 pandemic, resulting in late cancer diagnosis or delayed referral to the Trust, and also a potential gap in the education around the management of oncology wounds. In 2022, we were presented with the opportunity to assess the potential impact of a 100% Chitosan with Bioactive Microfibre Gelling (BMG) dressing to support wound management objectives and to work in partnership with industry to provide education, support and training across this patient group.

## Method

Following hospital trust and appropriate patient protocols being completed, including patient consent and imagery, a ten patient case study series to assess the impact of a Bioactive Microfibre Gelling (BMG™) dressing was performed over a four-week period. Patient recruitment was initially in the hospital trust and upon discharge the evaluation continued across the wider community. The dressing claimed to be suitable across all four stages of the wound healing process which was significant in this patient group. Wound types included fungating tumours in the neck (2) breast (2) sacral tumour (1) submandibular (1) groin (1) and three patients with Lymphomas (3). Ten patient evaluations were carried out over a 4 week period across primary and secondary care. We wanted to assess the potential impact that this new advanced woundcare dressing could have in the specific management of oncology wounds.

## Results

See overleaf

## Discussion

Many of the symptoms discussed in this poster can have a deleterious effect on the patient. Cancer wounds can result in major irreversible skin damage, cause extreme pain and discomfort which can affect daily activity. They can be disfiguring, foul smelling and appear repulsive to the patient. This can result in an individual's self-esteem, body image and quality of life being severely affected.<sup>(2)</sup> The introduction of this advanced woundcare dressing has demonstrated an opportunity to share the benefits seen in our results with other clinicians.

## Conclusion

The impact that the introduction of this advanced dressing has had in such a short period of time has been remarkable. A virtual conference and two virtual symposiums have since been delivered to update clinicians across the UK in oncology wound management. This also facilitated the sharing of results which was an enhanced experience for all involved. Further publications including pathway development and presentations are planned to share best practice from a European and International perspective.

## Case Study 1

56 yr female with Malignant wound to the left side of her neck that had been present for 12 months. Patient was undergoing radiotherapy. Objective to encourage granulation, reduce exudate and associated odour, reduce excoriation during patient's end of life care.

### Initial assessment 24th April 2022

**Wound dimensions:** L8.5cms x W3cm x D 0.5cms  
**Wound bed condition:** 40% Slough 50% Granulation 10% Over Granulation  
**Exudate level:** High **Malodour:** Moderate  
**Pain level:** 5 on VAS

**Previous treatment:** Daily dressings with hydrofibre and superabsorbent. Antibiotic therapy for wound infection. Radiotherapy treatment, slight excoriation to periwound skin.

### Final assessment 24th May 2022

**Wound dimensions:** L5cms x W0.5cm x D0cm  
**Wound bed condition:** 5% Slough 75% Granulation 20% Epithelialisation  
**Exudate level:** Low **Malodour:** No longer present  
**Pain level:** 2 on VAS

**Summary:** Periwound skin healthy. Community nurses able to perform dressing changes alternate days which allowed patient comfort during her end-of-life care. Patient found the dressing extremely comfortable and was very pleased with how the dressing managed both exudate and in particular odour and supported some reduction in wound pain.



24.04.2022



03.05.2022



09.05.2022

## Case Study 2

49 year old female with T Cell Lymphoma to left arm (5cm x 4.5cm) and satellite wound (3.5cm x 3.5cm). Objective to manage patient's pain levels, promote healing and protect granulation tissue, manage exudate and support autolytic debridement.

### Initial assessment 21st April 2022

**Wound dimensions:** L5cm x W4.5cm x D0cm  
**Wound bed condition:** 80% Necrotic 10% Slough 10% Granulation  
**Exudate level:** Moderate **Malodour:** Significant  
**Pain level:** 8 on VAS

**Previous treatment:** Foam dressing and enzymatic alginogel tried with no success. Patient's husband changing the dressings at home 2-3 times per day.

### Final assessment 26th May 2022

**Wound dimensions:** L4cms x W3cm  
**Wound bed condition:** 60% Granulation, 40% Epithelialisation  
**Exudate level:** Low **Malodour:** No longer present  
**Pain level:** 2 on VAS

**Summary:** Within 4 days of commencement of use of dressing, pain reduced, necrotic area debrided, slough softened, odour reduced, and dressing change reduced from 2-3 times per day to daily, allowing supported self-care. Periwound skin much improved. Patient requested to continue with dressing beyond evaluation. Patient was also receiving immunotherapy treatment.



21.04.2022



28.04.2022



30.06.2022



13.10.2022

## Results of the 10 patient clinical evaluation

### Clinical Benefit

#### Haemostat

### Patient Results

2 patients experienced bleeding from their wounds. The BMG dressing facilitated haemostasis in both cases.

### BMG Dressing Mode of Action

The positively charged chitosan fibres of this BMG dressing attracts negatively charged blood cell membranes, initiating the agglutination of red blood cells and platelets.<sup>(3)</sup> This promotes the activation of thrombin, which activates the clotting pathway, leading to thrombus formation. to activate haemostasis.

#### Antimicrobial / Antibiofilm Action

4 patients demonstrated suspected or confirmed infection present in their wounds. Reduction / elimination of infection in all 4 patients.

Oncology wounds can become infected and run the risk of increased and repeated infections which was seen during this evaluation. The positively charged chitosan fibres attract, disrupt and kill bacteria within the dressing therefore reducing the bacterial load which is a barrier to healing. Biofilms adhere to the gel matrix when the dressing is changed the biofilm is removed.<sup>(4)</sup>

#### Odour Management

4 patients had malodorous wounds. In all cases malodour was reduced or eliminated within first few dressing changes.

The BMG dressing demonstrated the ability to reduce odour by facilitating removal of the devitalised tissue and slough.

#### Exudate Management

The BMG dressing effectively managed exudate in all 10 cases for a longer period of time compared to previous dressings and periwound skin protected from further breakdown.

BMG technology and the dressings vertical wicking action allows for increased absorbency and strength. This resulted in effective exudate management and periwound skin protection together with longer dressing wear time which improved patients quality of life due to reduced dressing changes and clinic visits. The dressing was also able to be removed in one piece.<sup>(4)</sup>

#### Pain Reduction

All 10 patients reported a reduction in pain (on visual analogue scale) within the first few dressing changes.

Chitosan has been shown to have the ability to prevent the release of, and to help absorb the bradykinin that is released at the wound site and causes pain by directly stimulating primary sensory neurons.<sup>(5)</sup>

#### Promotion of Wound Healing

A reduction in wound area was seen in 9 patients, which in turn increased patient concordance. 1 patient's wound was non healing, however objective in this case was to manage wound symptoms during end of life care.

The BMG dressing aids autolytic debridement in helping to remove slough and necrotic tissue. BMG Chitosan fibres have demonstrated cell migration similar to a positive control, demonstrating no toxicity and reflecting its contribution to supporting wound healing.<sup>(6)</sup>

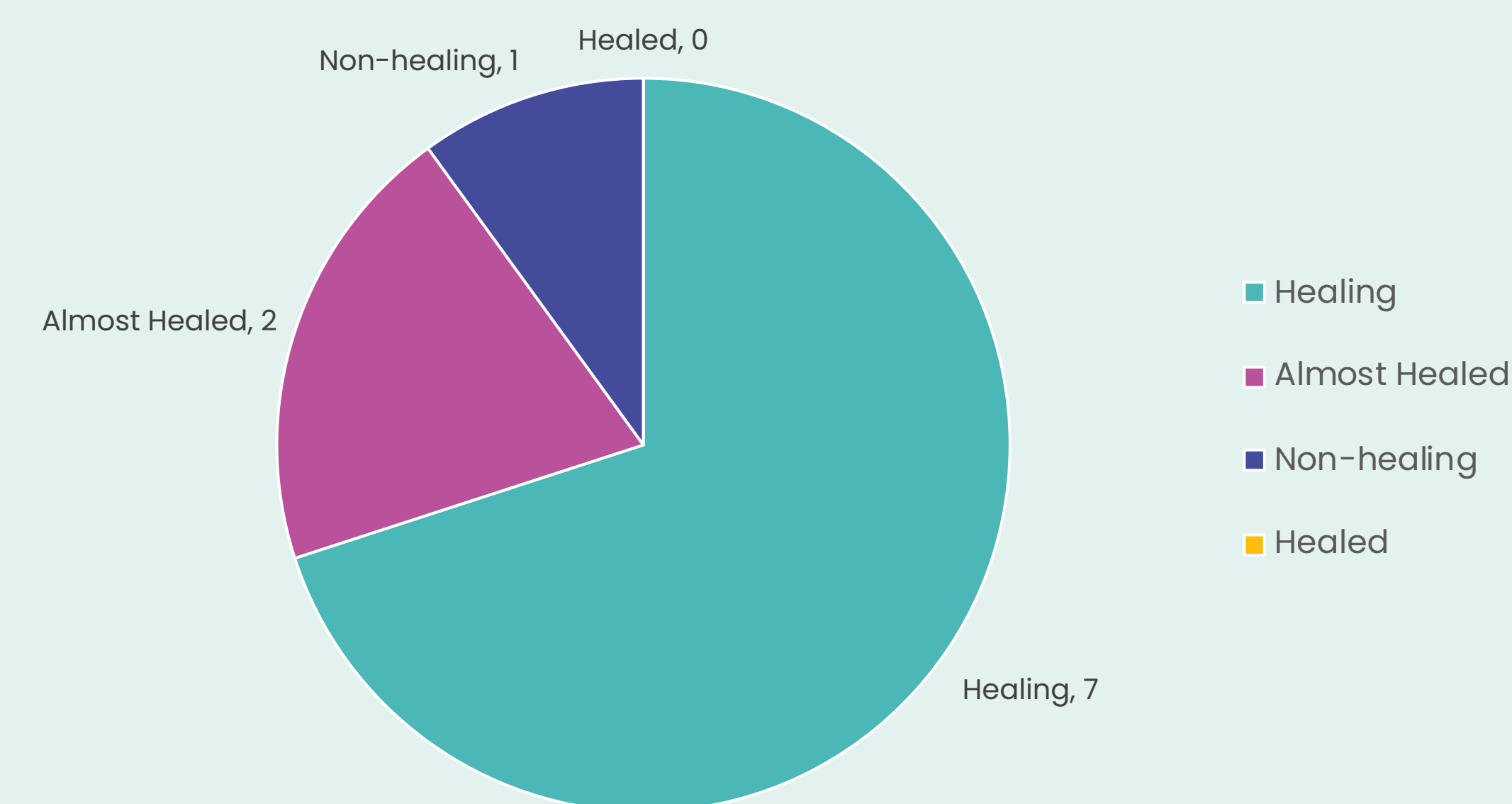
#### Reduction of Inflammation

In 3 patients the BMG dressing supported end of life care in which management of both inflammation, exudate, odour and periwound skin was extremely important.

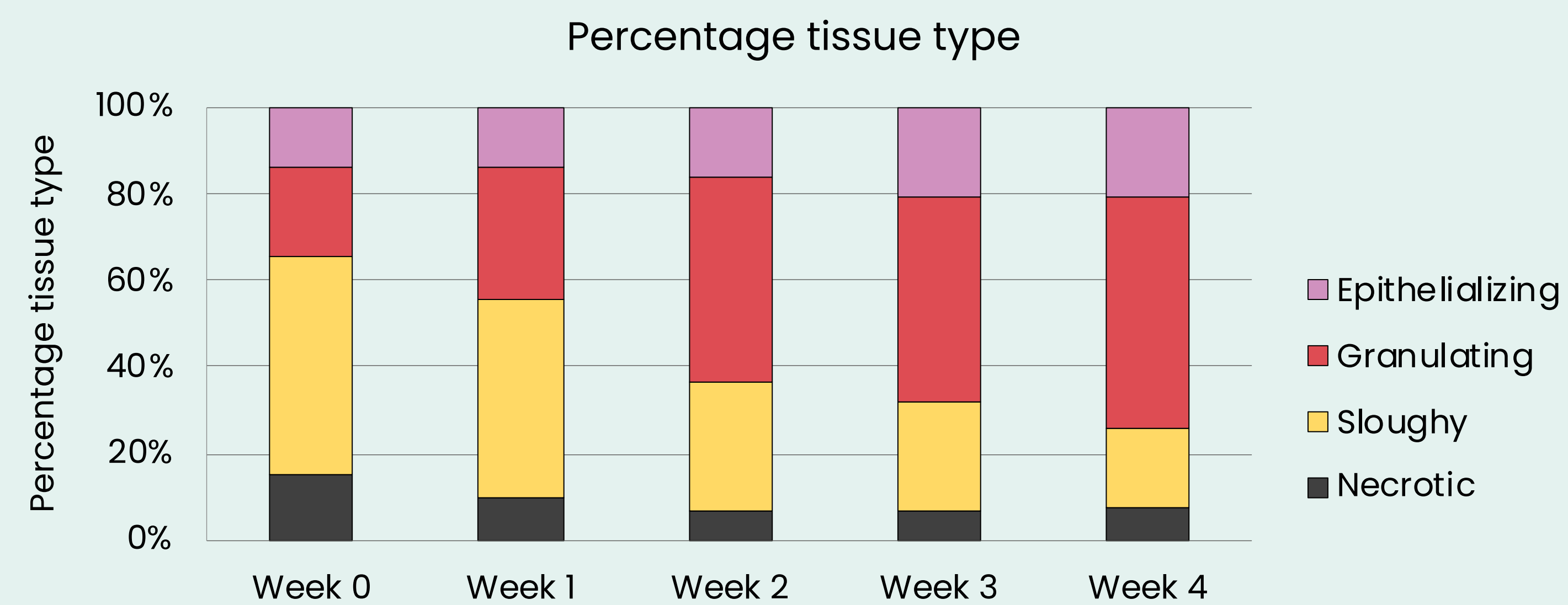
The inflammatory response is essential for wound healing. However, in many wounds chronicity is associated with wounds remaining in this inflammatory phase with inflammatory proteins and other cytokines beginning to interfere with the healing process, this can lead to wound stasis and pain. Chitosan has a positive effect in reducing chronic inflammation. The BMG dressing has been shown to significantly reduce levels of MMP's.<sup>(4)</sup>

# Results of 10 patient clinical evaluation

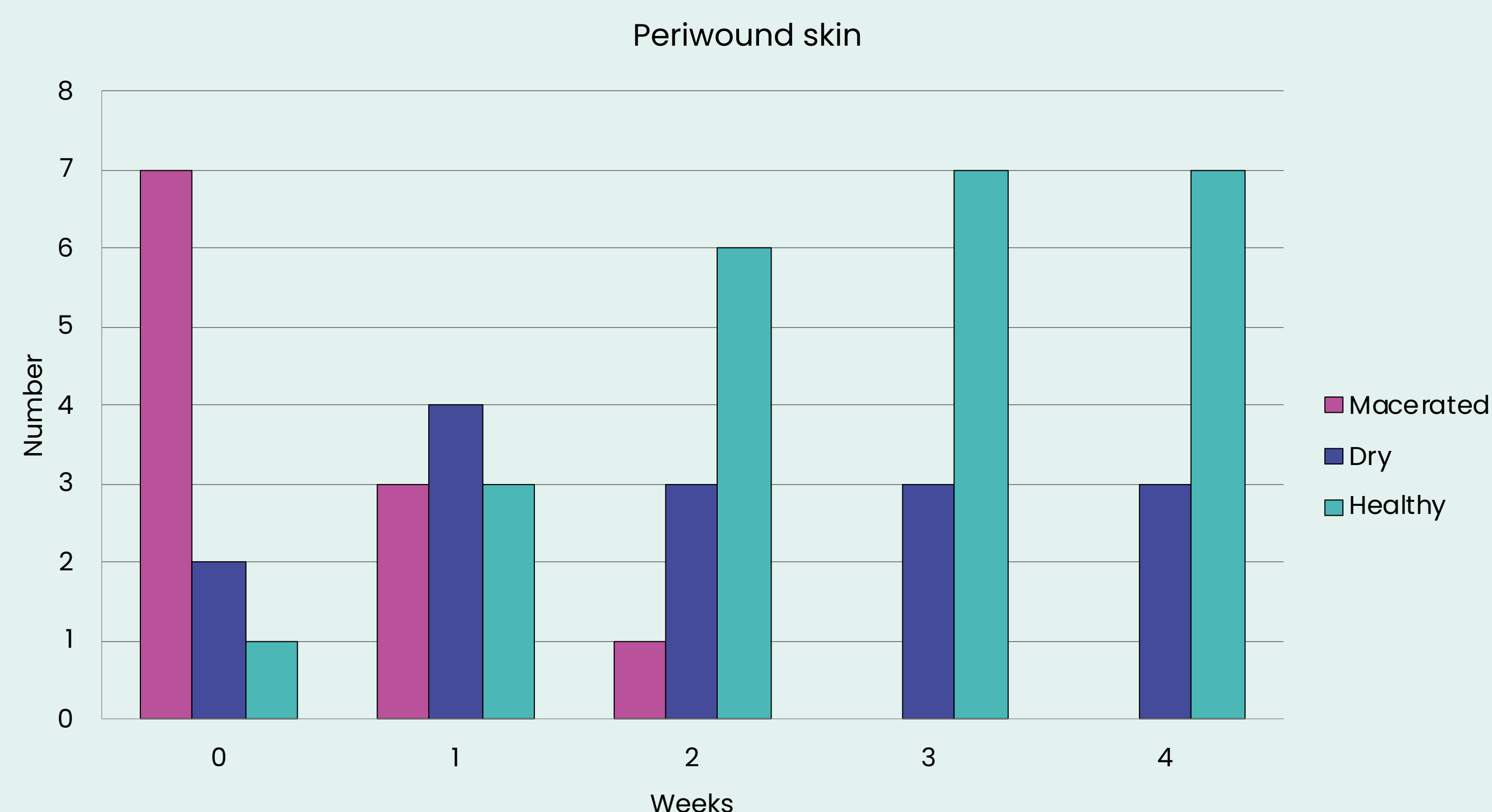
**Fig 1. Wound Status by end of 4 week evaluation period.**



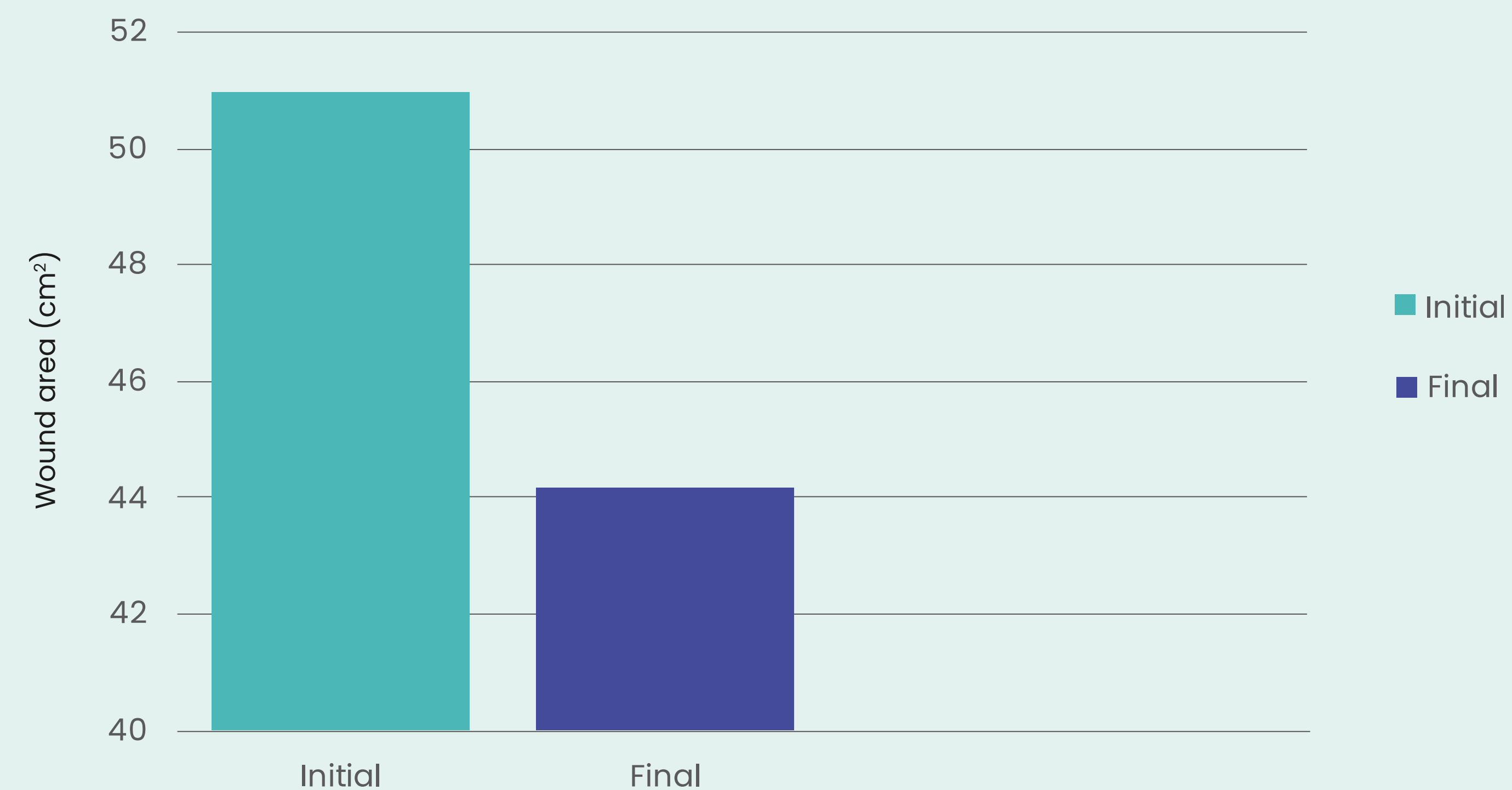
**Fig 2. Change in percentage tissue type throughout 4 week evaluation period.**



**Fig 3. Periwound skin condition throughout 4 week evaluation period.**



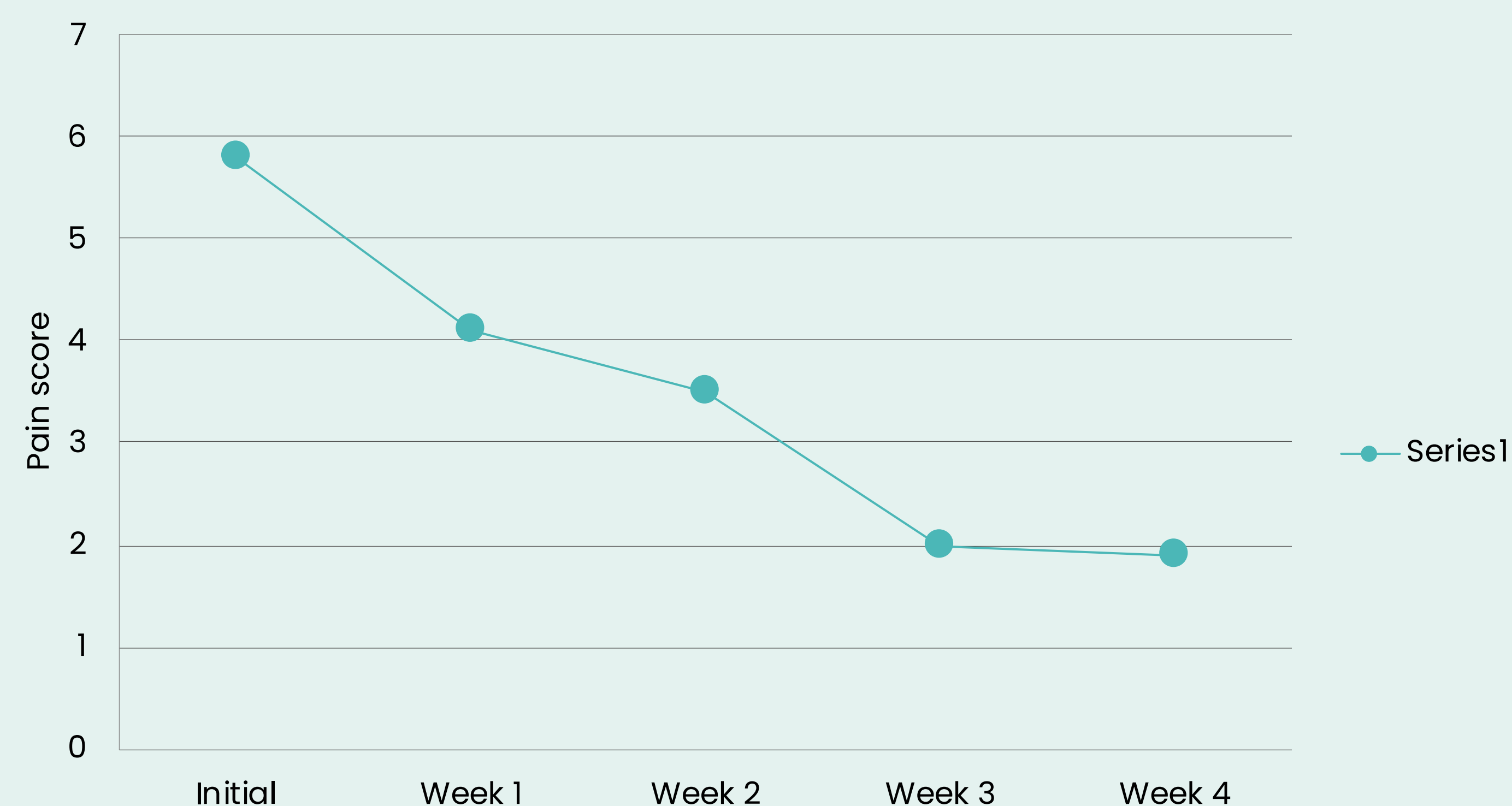
**Fig 4. Average wound area reduction from initial assessment, to final evaluation at 4 weeks.**



Scan for more information on the BMG dressing evaluated.



**Fig 5. Change in average patient reported pain levels (on visual analogue scale) over 4 week evaluation period.**



**References:**

- (1) Naylor W, Lavery D, Mallett J (2001) The Royal Marsden Hospital Handbook of Wound Management in Cancer Care. Blackwell Science, Oxford.
- (2) O'Regan P, (2007) The Impact of Cancer and Its Treatment on Wound Healing. Wounds UK Clinical Review, Vol 3, No 2.
- (3) Chen Z, Yao X, Liu L, Guan J, Liu M, Li Z, Yang J, Huang S, Wu J, Tian F, Jing M. Blood coagulation evaluation of N-alkylated Chitosan. Carbohydrate polymers. 2017; 173:259-68.
- (4) CD Medical, Data on file.
- (5) Okamoto et al., Analgesic effects of chitin and chitosan, May 2002, Carbohydrate Polymers 49(3):249-252
- (6) Edwards-Jones, V (2023) Bioactive Microfibre Gelling (BMG) technology - in vitro testing of this new innovative dressing with inherent bioactive and antimicrobial properties, Wound Care Today 2023.
- (7) MaxioCel® is the Bioactive Microfibre Gelling (BMG) dressing referenced throughout.