

Exploring How Dolphin Fluid Immersion Therapy Improved Pain Management, Reduced Analgesia Requirements & Prevented Skin Breakdown for a Patient Receiving End-of-Life Care

Daisy Culaj:

Tissue Viability Lead Clinical Nurse Specialist



The Hillingdon Hospitals
NHS Foundation Trust

CASE STUDY INTRODUCTION

Patient M, a 91-year-old female, was admitted to hospital with community acquired pneumonia. She was extremely unwell and had been receiving end of life care at home. Her past medical history included:

! Lung carcinoma

! Dementia

! Hypertension

CLINICAL CHALLENGES

On admission, Patient M had a deep tissue injury (DTI) to her right heel, and a PURPOSE-T risk assessment scored RED (high risk). Although she had no other areas of skin breakdown, she was extremely vulnerable for the following reasons:



Immobility:

Patient M was bedbound and unable to reposition herself independently.



Pain:

She required regular changes of position, but was in a lot of pain, which worsened every time she was moved. Continuous and breakthrough analgesia reduced the pain, but didn't completely relieve it.



Repositioning:

The repositioning that was necessary to prevent further skin breakdown became very stressful for Patient M, her family, and her caregivers.



Overall Condition:

Patient M was extremely unwell, and rapidly deteriorating, exacerbating the risk of further skin damage.

'STEP UP' TO DOLPHIN THERAPY – RATIONALE AND PATIENT OBJECTIVES

Dolphin Therapy is a unique reactive support surface that simulates a fluid environment. It immerses the patient, as if they are buoyant on water, to minimise compression of soft tissue by weight or gravity. Extensive research has demonstrated that it maintains tissue symmetry,¹ minimises vascular occlusion² and prevents tissue ischaemia, even when the patient is nursed directly on a wound.³

Dolphin Therapy can provide a 'step up' solution from traditional dynamic air mattress technologies such as alternating pressure, continuous low pressure, and low air loss. It has proven to be extremely effective in the management of highly complex patients, for both prevention and treatment of skin damage.⁴ On admission, Patient M was placed on a traditional alternating pressure mattress. After nine days in hospital, she had started to deteriorate with worsening pain, and the TVN was asked to carry out an assessment. Patient M didn't have any further skin breakdown, but the ward staff were very concerned that this could happen at any time because she was now so unwell.

The TVN decided that Patient M should be 'stepped up' to Dolphin Therapy with the following objectives:



Improve Pain Management & Comfort:

Patient M was experiencing considerable pain and discomfort, with analgesia only providing partial relief. The pain appeared worse when she was repositioned, but she was tense generally, and the TVN thought the alternating cell cycles on the traditional mattress may be contributing.



Pressure Area Care:

The patient was extremely vulnerable to pressure damage, as multiple organ failure, including her skin, was now worsening. Plus, the TVN had concerns that the cyclical higher pressures in the alternating mattress cells could cause damage to Patient M's skin.



Reduce Turning Frequency:

This would hopefully decrease the pain and discomfort that repositioning was causing.



Figure 1. Dolphin Fluid Immersion Simulation Therapy

OUTCOMES

Patient M was nursed on the Dolphin Therapy surface until she passed away, four days after placement. Over that short time period, the outcomes described below were achieved.

Pain Management & Comfort:

At the time Patient M was placed on the Dolphin Therapy surface, she had been receiving the following medication subcutaneously over 24 hours, delivered continuously via a syringe driver:

• Morphine 10mg

• Cyclizine 50mg

• Midazolam 10mg

Prior to Dolphin Therapy, she also required 2.5mg of morphine PRN, subcutaneously, for breakthrough analgesia. This was usually given twice per day. Patient M continued with the syringe driver medications, at the same dosages, until she passed away however, the following outcomes were noted during her time on Dolphin Therapy:



The day following Dolphin Therapy placement, she was noticeably more relaxed, including during repositioning, with no obvious pain.



Because of this, the staff and her daughter felt the breakthrough analgesia was not required. She didn't need it again, as she remained comfortable and settled without it.

Pressure Area Care:

The following pressure area care outcomes were achieved despite a rapid and dramatic decline in her overall condition, including end of life skin changes.



The DTI to Patient M's right heel remained static whilst she was nursed on Dolphin Therapy, and she did not develop any new areas of skin damage.



Prevention of further skin breakdown contributed to her overall comfort and well-being during the last few days of her life.

Turning Frequency:

The initial objective of reduced turning frequency was not achieved. However, the reason for this objective originally was to decrease the associated pain and discomfort. Therefore, the TVN decided that as the patient was now tolerating movement much better, the turning frequency should be maintained for optimal pressure offloading. Importantly outcomes were noted as follows:



After placement on Dolphin Therapy, she became notably more comfortable, and was no longer showing signs of pain or distress when being moved.



The objectives for pain management, comfort and pressure area care were all achieved for Patient M.



In addition to the ward staff noticing a significant improvement, her daughter stated that Mum was noticeably more settled on the Dolphin mattress.

DISCUSSION

The 'step up' to immersion therapy offered the best clinical solution for Patient M. As well as reducing pain and increasing comfort, it helped to prevent skin breakdown. The effectiveness of Dolphin Therapy in reducing pain was evidenced by the fact that breakthrough analgesia ceased to be needed. Apart from the mattress, there were no other changes to Patient M's care. The immersion and envelopment it provided, which is very different to lying on a cyclical alternating pressure mattress, allowed Patient M to become more comfortable and relaxed, to the point where she could be repositioned without discomfort.

Dolphin Therapy has been used successfully for end of life patients since 2012 in the UK. Common benefits include successful prevention and treatment of skin damage, with improved comfort and pain management.⁴ These benefits have been clearly demonstrated in this case study. In summary, for Patient M, the 'step up' to the Dolphin Therapy mattress helped her to experience a peaceful, comfortable, and pain-free end of life journey.

REFERENCES

- Worsley PR et al (2015). The effects of a fluid immersion mattresses; an evaluation of fluid immersion therapy for the prevention of pressure ulcers. 18th Annual Meeting of the European Pressure Ulcer Advisory Panel, 17th September 2015. Faculty of Health Sciences, University of Southampton.
- CT scans from St Joseph's Hospital, Tampa, Florida.
- Mayes KL et al (2012). Cost effective care without clinical compromise: Incorporating the Dolphin Fluid Immersion Simulation Mattress System into the postoperative care of patients undergoing myocutaneous flaps. Poster presented at Wild on Wounds National Conference, September 12 - 15, 2012, Las Vegas, NV.
- Medstrom (2023). The effectiveness of Dolphin Therapy fluid immersion simulation support surface. Outcomes for over 3,000 highly complex patients. Available at: <https://www.medstrom.com/wp-content/uploads/2023/03/SM1153-Dolphin-Therapy-3000-Patient-Outcomes-Report-Rev1-Mar-2023-1.pdf> (Accessed online 12/06/2023).