

# Clinical Evaluation of the use Medstrom Dolphin Fluid Immersion Therapy & Linet Multicare bed in the treatment of patients with major burn injuries. Sheralyn O'Hara Critical Care Sister & Liz Shale Burns Centre Senior Sister

## Overview

University Hospitals Birmingham NHS Foundation Trust (UHB) is one of the largest teaching hospital Trusts in England. The Queen Elizabeth Hospital Birmingham has 1,213 beds, 30 theatres and the largest single site Critical Care unit in Europe, with 100 beds. Within Critical Care are two dedicated beds for major burns patients. The patient pathway is to progress from these beds to one within the 15 bedded Burns Centre to continue their journey.

QE Birmingham serves as the Burns Centre for the Midlands Burn Operational Delivery Network. The MBODN plans care for 13.7 million people, equating to approximately 20% of the population of England. Major Burns are accepted to the trauma centre (Critical Care area B), meaning patients with (>30%burns/>20% full thickness burns); those requiring mechanical ventilation for inhalation injuries; are admitted to the Critical Care beds for care (National Burn Care Referral Guidance. <https://www.britishburnassociation.org/wp-content/uploads/2018/02/National-Burn-Care-Referral-Guidance-2012.pdf>). Approximately 250 patients are admitted to QE for Burns treatment on an annual basis. A total of 256 were admitted in 2019 and an additional 408 seen by the service.

## UK arena

In 2017 more than 40 admissions to NHS burns services were classified as extremely severe, with these burns costing more than £95,000 each to treat. The NHS burns services treated more than 15,000 patients for burns and scalds in 2017 at a cost of more than £20 million<sup>1</sup>. The average cost to the NHS for a major burn is £168,155<sup>2</sup>

## Evaluation purpose/aims

The purpose of this evaluation was to source products that could be used to provide better clinical outcomes for patient journey from Burns ICU to Burns Centre. In addition to looking at the clinical outcomes, the aim was to seek products that provided less rental expenditure, standardisation of equipment used between both clinical areas, a partnership with the product provider, collaboration, in driving improvements for staff and patients, and improved service provision to provide nurse time efficiencies.

## Product mix/selection

Having discussed the Burns teams equipment needs and products available, Medstrom Dolphin Therapy and Linet Multicare bed were selected.

Dolphin Fluid Immersion Therapy provides an artificial fluid environment to nurse the patient. This reduces compression of soft tissue, which means near to normal blood flow through tissues, even when they are laid directly upon, and reduction of ischaemia. This was a priority to aid healing, assist in take of graft sites and to reduce issues of pressure damage.

The Multicare bed provides lateral tilt to assist with nursing interventions. By having lateral tilt the caregiver is required to overreach less and the 'work' of the turn is reduced. Automatic lateral therapy can be programmed to maintain mobilisation of chest secretions and has been evidenced to reduce incidence of VAP. Ability to use the bed to mobilise the patient into full chair position and edge of bed sitting with lateral tilt as patient condition improves. Class III scales are integral, allowing patient to be weighed frequently without moving the patient.

## Design

A data collection tool was used so the patient's journey could be documented, to include, which features of the surface and bed frame were used and staff thoughts on the benefits to themselves and their patient by using them.

## Sample of patients:

Over the evaluation period 4 patients were admitted. The ages, sex, height, weight, acuity score and percentage burns are detailed as below.

	Patient 1	Patient 2	Patient 3	Patient 4	Mean/average
Age	50	63	75	48	59
Sex	Male	Male	Male	Male	-
Height	175cm	170cm	177cm	177cm	174.57cm
Weight (kg)	88	75	75	75	78.25
Risk score	40	40	23	26	32.2531
% Burns	31	52	12	42	34.25%

Staff stated for all four patients that their objectives for care were to treat existing burns, prevent further damage due to pressure, optimise post surgical wounds and graft sites by minimising shear which may be caused by cell cycle alternation. In addition to skin integrity the desire to use the equipment to assist in repositioning and to gain regular body weight, using class III integrated scales, to ensure patients do not lose more than 10% body weight to optimise healing.

## Results

### Skin integrity:

Three of four patients had improvement in skin condition, two were prevented from having any pressure damage despite challenges of repositioning this group of patients. Increased patient comfort on Dolphin Therapy and increased sleep patterns were noted in the study group. The 4<sup>th</sup> patient was palliated and passed away after a few days.

### Repositioning:

Staff indicated that reasons for finding repositioning challenging was due to patient weight, pain, volume of burns dressings, dressings being wet and or slippery, number of staff needed to turn patient, clinical instability (respiratory issues, vomiting, heamodynamically unstable). These periods of critical clinical instability extended periods between repositioning, meaning ability to tilt patient to off load areas assists in minimising skin damage.

Automatic lateral tilt had documented use in two of the four patients. The degree of automatic and lateral tilt varied from 5-20 degrees periods between use 30 mins – 2 hourly. Automatic lateral therapy was not utilised for two patients despite the patients having inhalation injuries, the need to maintain an extended chest in Bradford slings and ability to use ALT were in opposition.

Staff felt that the ability to put lateral tilt on to the bed frame did reduce the number of staff needed to turn two of the four patients. Staff commented that the turning was aided, the turns were effective, less strain on caregivers backs providing turn, repositioning was less painful for the patient, repositioning could be achieved without having to rely on waiting for more staff to become free to assist with the repositioning, and the tilt allowed one of the four patients to successfully assist in their repositioning, aiding them to become more independent. Other advantages to having lateral tilt were that secretions were more easily suctioned after use and tidal volumes increased, the tilt aided chest physiotherapy and that the patient was able to participate in which side and degree of angle to be turned to, increasing comfort.

## Results (cont.)

### Mobilisation:

One of the four patients had documented use of the chair position. This patient used the products for 14 weeks. Details of use show that the chair position was used once or twice a day for 30 minutes. The comments about this show that it was used in conjunction with the physiotherapy sessions. Staff felt it was a better position than other beds and the physiotherapy team liked the sitting position achieved. Sitting at the side of the bed progressing to standing or marching was also utilised.

### Class III Scales:

All patients nursed on Multicare used the Class III scales to assess weight of patients. Caregivers documented that this was of benefit to patient care.

## Conclusion

Dolphin Therapy provided a suitable surface to nurse the sample size of four major burns patients. The staff noted as well as improvements in skin condition and prevention of pressure associated injury that the patients benefitted from improved comfort and improved sleep.

The surface combined with the Multicare frame provided benefits to repositioning patients as the lateral tilt reduced work of the turn, provided less pain for patient during repositioning, in some cases the need for as many staff to reposition, allowed the patients to participate in care/repositioning, assisted in chest physiotherapy, suctioning of secretions and better tidal volumes. The chair position was thought superior to other bed frames and was well accepted by the physiotherapy team as the patient condition progressed.

Benefits were achieved from a financial perspective. Savings are made of £50 a day vs prior rental options. In total, the rental cost savings for these 4 patients equated to £10,887.

Additional benefits have been that the Burns teams have had rigorous training on use and benefits of the products features, continuous input from the Medstrom team, 24 hour 365 day a week clinical and service support.

### References:

- <https://www.cbtrust.org.uk/news-and-events/burn-accidents-costing-the-nhs-20-million-per-annum-show-latest-statistics-released-on-national-burn-awareness-day>
- <http://www.cbtrust.org.uk/burn-prevention/database/>