

# A study into the effectiveness of 24 Hour Postural Care in the Management of Contractures in Care Homes

Nursing/Residential Care Home, Middlesbrough

2016/2017

**Authors:** Kim Owens and Gemma Daly – Occupational Therapists, Middlesbrough Social Care

## **Abstract**

### **Aim:**

The aim of the trial was to explore the effectiveness of a 24 hour Postural Care programme in the management of contractures in residents in a Care Home environment.

### **Method:**

7 residents were identified from a 64-bed Care Home registered with the CQC to provide Nursing Care and Rehabilitation for those over 65 years old. They presented with different degrees of contractures ranging from early onset to severe and confined to bed.

A combination of therapies was applied which included training of Care Home staff, implementation of night-time positioning systems for all, and supportive day time seating when possible.

Baseline measurements of Range of Movement of the lower limb were taken using an Acumar™ Dual Digital Inclinometer. Further measurements were taken and recorded every 3 months over a 9 month period. Pressure mapping readings for each resident were also recorded using a full-length FSA Boditrak™ Pressure Mapping System.

Comments from the residents, their families, Care Home staff and the Clinicians were also recorded.

### **Results:**

With all Residents, the implementation of night time positioning was able to improve their posture from the outset. For the Residents who consistently used the sleep system, personal care became much easier and the Residents presented as being happier and comfortable. During the day some of the Residents were able to be seated out which enabled repositioning requirements and, more importantly, social inclusion.

High risk pressure areas in lying, such as the shoulders, pelvis and heels were eliminated through the combination of implementing the sleep system and the improved posture.

Most encouraging was that, during the study, where the sleep systems were consistently used, we were able to achieve an improvement in range of movement at the lower limbs. Some improvements were considerable and **contractures were reduced.**

### **Conclusion:**

The results suggest that the implementation of a 24-hour Postural Care programme in a Care Home environment can result in the reduction of contractures and improvement in quality of life and ease of care.

It is recognised, however, that a significant investment in staff training and subsequent consistency of intervention is required for successful outcomes. Middlesbrough Council have already invested in further postural care training for Health Professionals.

Following this trial, 6 of the 7 residents continue to benefit from a 24-hour Postural Care programme and progress will be monitored so that this report can be updated in the future.

The clinical evidence from the trial has enabled the clinicians to continue working with residents in Care Homes in a preventative manner to manage their posture over a 24 hour period in the most effective way. Similar positive outcomes are being recorded.

There is a need for services to be delivered in a more innovative way in response to the postural problems and associated health issues experienced by residents in care homes. The evidence demonstrated that people are benefitting from 24 hour postural management and taking a proactive approach is cost-effective and beneficial to both the individual and care establishment.

# Management of Contractures in a Care Home environment

Nursing/Residential Care Home, Middlesbrough 2016/2017

## INTRODUCTION and BACKGROUND:

Residents in care homes are often coping with the effects of prolonged immobility, poor positioning and inadequate seating e.g contractures, pressure ulcers and respiratory problems.

Contractures in the elderly result from an imbalance in muscle groups resulting in shortening of the stronger of the antagonist muscle pair. This is frequently seen in those whose condition leads to reduced use of particular muscle groups. A lack of stretching can lead to a reduction in the available range of movement which in turn further reduces joint mobility in a vicious rapidly occurring cycle.

Residents with contractures end up in fixed positions, becoming curled and “wind-swept”. Quality of life is decreased due to pain, reduced function, inability to change position, increased pressure risk and inability to walk and to sit out. Social integration is also reduced.

Contracture is common in those with advanced Dementia, Alzheimer’s or Acquired Brain Injury. As contractures develop, delivering quality care to these frail residents becomes increasingly difficult and stressful for staff. Difficulties are experienced in dressing, feeding, personal care, transfers, skin care and communication.

In response to this, a ‘Prevention and Postural Management’ project for residents in Care Homes was piloted in Middlesbrough by two Occupational Therapists. The project initially focussed on postural management around seating however, it was recognised that the only true way to tackle this issue was to address the postural management needs over a 24 hour period.

A report had been completed by the local Posture Care Forum regarding the benefits of 24 hour postural management and a review of Providers of associated equipment completed. This information was reviewed when considering which products could support the work to reduce the development of contractures in residents in our care homes. This led to the opportunity for the Occupational Therapists to conduct a study working in partnership with Symmetrikit to explore how a postural care regime could support residents and carers alike. This exploration was intended to inform and guide future practice and identify where limited resources could be most beneficial.

The study took place in a single care home in Middlesbrough. Following clinical assessment of need, permissions were granted by 7 residents, or their families to introduce Symmetrisleep™ Night Time positioning followed, when appropriate, by supportive day time seating and to carry out range of movement measurements in the lower limb. This was seen to be the most appropriate measurement as this is where muscle contracture is most prevalent. The Authors were also very aware of the importance of staff education and support and a detailed training and continuing support programme was implemented.

## METHOD:

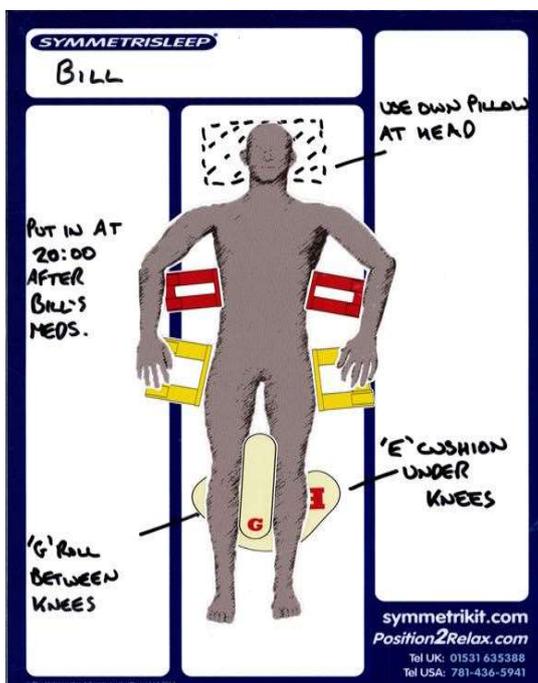
Following an initial meeting with Symmetrikit Postural Care, the Authors outlined the plan for the project with objectives agreed. A very brief, unobtrusive, visual assessment was completed with the Care home's residents to assess suitability for participation and 7 residents were identified – ranging from early indications of contracture issues to two residents who were severely contracted and confined to bed.

Permissions were sought from the residents, their families and the care home. A signed 'Permissions Document' was attained (see appendix A)

An earlier study sponsored by HealthWorkforce Australia on how to implement a Postural Care programme (Brightwater Care Group WA<sup>1</sup>) indicated that ownership was essential at all levels so all care staff who would be supporting the project were invited to attend Symmetrikit Carer Workshops. The first Workshop was attended by 5 Care staff and, notably, 3 family members. The 24 hour Symmetrikit Workshops<sup>2</sup>, which have theory and practical sessions, have been delivered for over 15 years and provide an introduction to Postural Care. Those attending receive a Certificate of Attendance on successful completion – A copy of this Workshop is available through [www.symmetrikit.com](http://www.symmetrikit.com)

It was agreed that Symmetrikit would provide all Symmetrisleep™ systems for the participants, ready for the project implementation on 25.01.17

A further two Family/Carer Workshops and training sessions, individual clinical measurements, pressure mapping and setting-up of the systems took place over 2 days (24<sup>th</sup> and 25<sup>th</sup> January 2017). Implementation of the systems was made simpler for staff with the provision of "sticker charts" which clearly identify how the system is to be used, with colour-coded component images and notes unique to each resident.



Typical "Sticker chart".

Following the Workshops staff were coached through the initial set up of the night time positioning systems for each resident.

Prior to installation, a base line range of range of movement was taken across the knee using an Acumar™ Dual Digital Inclinometer. (These tools give an instant readout of angle without having to find any “hinge point”). Measurements included the rested position and Flexion/Extension for each leg.

*Acumar™ Dual Digital Inclinometer in use with model.*

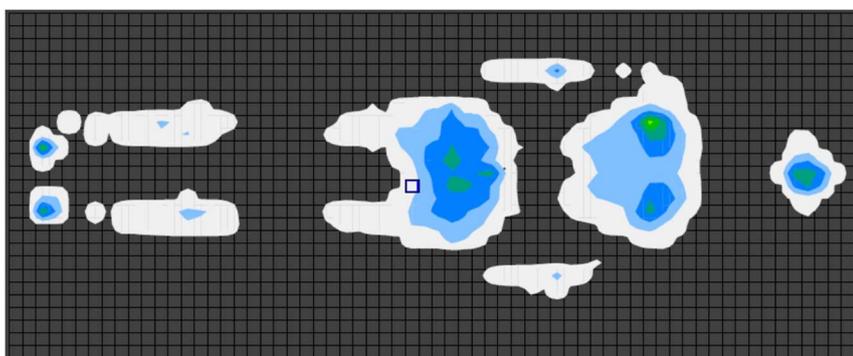


Each Resident was also Pressure Mapped using an FSA Boditrak™ Pressure Monitor.

A measurement was taken in an unsupported position and a measurement was then taken with the Night Time Positioning system in place using a specially designed form to record results. (see Appendix B)



*Full bed size FSA pressure mat and typical display with supine client showing pressure graduations.*



Following the initial measurements, each resident was given a Night Time Positioning system, provided by Symmetrikit® Postural Care.

The systems were, mostly, simple Starter Packs to ensure they were easy to implement and keep the additional burden on staff to a minimum.



*Representation of a Symmetrisleep™ system.*

## Initial Measurements and Pressure Mapping

(24<sup>th</sup> and 25<sup>th</sup> January 2017)

All 7 participants met with the project leaders for:

### **Contracture Measurement.**

1. Contracture Measurement – using the Acumar™ Dual Digital Inclinometer to record the following positions of each leg:  
***Rested position***  
***Fully contracted***  
***Fully extended***

Further Carer Training Workshops, held at shift changeovers meant another 7 Care staff and 2 family members attended.

In total, 25 carers and some family members completed the Workshops.

**25.01.17**

### **Pressure Mapping**

All participants were 'pressure mapped' in their usual lying position on their current mattress. After identifying which Symmetrisleep™ system components were required, each system was set up and the pressure mapping was repeated for comparative purposes.

## Discussion:

There is no doubt that properly introducing new practices is time consuming and it is important that anyone undertaking similar be aware of this.

Permissions were sought from the residents, their families and the care home. This highlighted the first challenge as this was time-consuming and so added to the Clinician's workload.

At the outset it was identified that training and support would be key to a successful implementation and delivered in such a way that, should there be a positive outcome, the trial participants and staff continue to benefit from the approach after the conclusion of the trial

Initially rotas, staff cover and staff 'buy in' to the project made it difficult to get the desired level of commitment from care staff. However, following the initial workshop, those who had attended then shared an enthusiasm with colleagues and it was immediately apparent that 'buy-in' would be easier going forward. News of the project and workshop success travelled as far as the Middlesbrough Council Commissioning and Safeguarding Team who then attended further training sessions.

The role of the lead OT is also recognised in that she was vital in contextualising duty of care responsibilities to management.

In all 22 staff/family members were in receipt of the training delivered across 3 sessions of 2-hour duration and the OT team were available to provide ongoing support.

| <b>Resident</b> | <b>Key Findings – Summary of results</b>  |
|-----------------|---|
| Resident 1      | Evidence of improvement in pressure and posture at start of trial but resident left the trial due to personal choice  |
| Resident 2      | Initial improvement recorded for pressure and posture with a more neutral position and less rotation in evidence. Range of movement in left knee improved by 17° and range of movement improved in right knee by 37°  |
| Resident 3      | Significant improvement in pressure recorded at shoulders, pelvis and thighs. Posture was much improved with a more symmetrical position achieved. Range of movement in left leg improved by 90° and range of movement in right leg improved by 77°. Resident was sitting out for longer periods instead of being restricted to bed |
| Resident 4      | Pressure improved with a more even distribution and reduction in peak interface pressures. Posture improved from hips down. Deterioration in left leg range of movement by 36° but improvement in right leg range of movement of 19° was recorded.  |
| Resident 5      | Range of movement in left leg improved by 16° and improvement in right leg range of movement of 8°. Significant improvement in pressure and high risk of pressure at shoulders, sacrum and heels was eliminated. Posture greatly improved with supine positioning close to midline  |
| Resident 6      | Pressure improved at shoulders and initially posture improved with symmetrical supine position close to midline with neutral pelvic alignment. Inconsistency of implementation resulted in deterioration of range of movement in left leg by 6° and range of movement in right leg by 4°  |
| Resident 7      | Initial assessment indicated paratonia. Range of movement improved in left leg by 25° after 7 months into the trial. Range of movement improved in right leg by 11°. Pressure mapping was not possible due to late entry of this resident to the trial.   |

The participants were spread between 3 units. Positive results were seen across all 3 units but support levels differed. The best results were when carers were most motivated and family members were involved.

1 of the 7 participants did not go forward with the trial due to personal choice which was disappointing as both posture and pressure were seen to be greatly improved during the initial assessment. Four out of six participants showed improvements in range of movement in both lower limbs, posture, quality of life and easier care. There was consistent use of the Symmetrisleep™ system with all four.

In one of the remaining 2 participants (resident 6), improvement was seen while the system was being used however, due to a lack of continuity, the Symmetrisleep™ system was withdrawn - soon after which deterioration occurred. Management have since intervened and the system is being progressively reintroduced. In the case of the other participant who showed some deterioration in 1 limb, only a partial system was introduced because of personal preferences. There were however improvements in tone and ease of personal care and she will continue with the system. It is possible that further improvements will be seen.

It was also interesting to note that at initial assessment all 7 residents were using airflow mattresses and demonstrated reduction in peak pressures when the positioning system was introduced.

During the trial, seating capability was continuously assessed. Resident 2 could not sit at the outset of the trial but is now able to sit out in a specialist chair. Resident 3 is now able to sit out for longer. At the outset, carers for resident 7 were not willing to move her to a supportive chair however her condition has improved enough for staff to be confident that they can comfortably transfer her. Specialist chairs were ordered for 2 residents.

Comments from staff and families indicate improved quality of life, wellbeing and easier personal care and are summarised below. It is suggested that in future trials these could be used as a basis for a more formalised interview. Capturing these would also be useful for staff feedback and motivation.

### **Summary of comments:**

***Resident appears 'much more relaxed' and is less resistant to passive movements. Whilst previously 'unseatable' due to contractures, resident appeared to have a good, neutral position at a recent seating assessment and new seating is on order.***

***Resident now engages more with staff.***

***Resident is looking very well and is very comfortable in her Symmetrisleep™ system. She has better head control, spends more time seated in her specialist chair and is now able to watch TV***

***Resident is a lot more aware generally, and more trusting with moving and handling than previously – indicating less resistance and less pain regarding contractures***

***There is evidence of improved social inclusion, quality of life and engagement.***

***Although the resident cannot communicate with other residents, she will now laugh when others are laughing.***

***One carer did report that the initial results of the trial were 'so inspiring' as personal care tasks became easier to manage.***

***Resident presents as much more relaxed and is much less resistant to intervention***

***Resident has now been provided with a basic chair which allows for good positioning of her leg and hip and she is using this chair regularly with the addition of a foot stool. Spending less time in bed and appears happy and comfortable.***

# **Contracture Management**

## **Trial Results**

## RESIDENT 2

### Personal Details:

Age: 86yrs

Weight: 48kgs

### Brief medical notes:

Arthritis

TIA's

High cholesterol and blood pressure

Dementia

Resident 2 has some cognitive issues but can communicate her decisions regarding food and drink and quietly expresses her wishes re OT input. She can also give reasons as to why she prefers to be in bed and not seated.

Profiling bed with airflow mattress. Bed dimensions 79x35x37" frame. Same bed used in Workshop training.

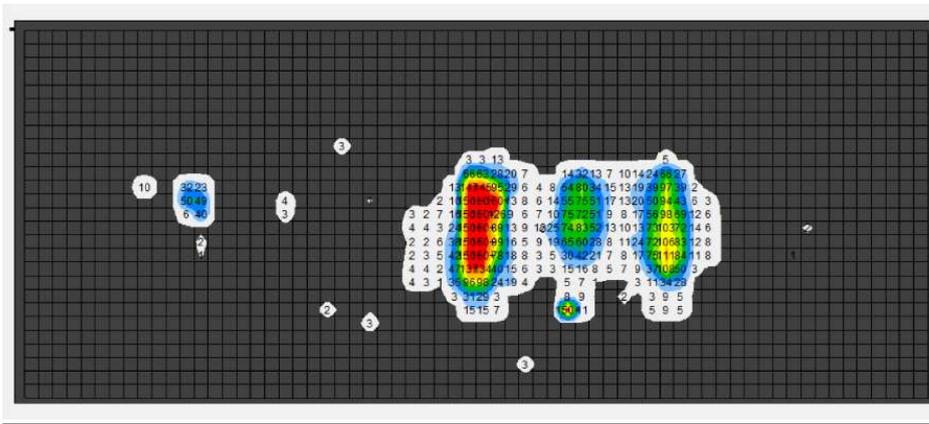
Resident 2 requires hoisting for all transfers and AO2 for support with positioning in bed.

Resident 2's daughter visits regularly, is very attentive to her needs and attended the Workshop.

### **Resident 2: pre-trial – 24.01.17 – Pressure Mapping & Contracture Measurement**



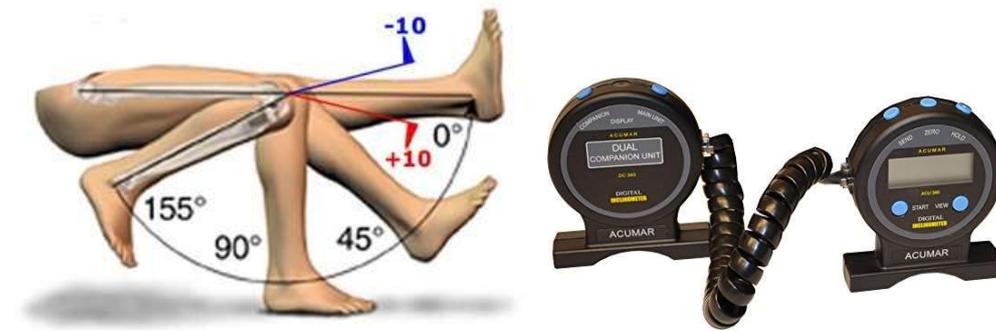
*Initial Resident positioning with standard polyester cushions*



Initial assessment on current mattress without support.

**Contracture Measurement chart:**

| CONTRACTURE MEASUREMENT |                  |                  |                 |                   |                   |                  |
|-------------------------|------------------|------------------|-----------------|-------------------|-------------------|------------------|
| RESIDENT 2              |                  |                  |                 |                   |                   |                  |
| Date                    | Left knee Rested | Left knee Flexed | Left knee Ext'd | Right knee Rested | Right knee Flexed | Right knee Ext'd |
| 24/01/2017              | 88°              | 125°             | 58°             | 105°              | 115°              | 95°              |
| 28/03/2017              | 90°              | 108°             | 56°             | 109°              | 140°              | 91°              |
| 08/06/2017              | 85°              | 139°             | 67°             | 102°              | 132°              | 94°              |
| 04/10/2017              | 82°              | 147°             | 63°             | 99°               | 147°              | 90°              |



**Observations:**

Resident 2 is bed-bound.

At assessment she had pelvic rotation to the left and internal rotation of her right hip.

Both knees were flexed and her left femur was held in flexion with 20 degrees lateral rotation.

Resident 2 had pain in her right hamstring and had very little active movement.

She found being moved stressful and this was demonstrated in a heightening of muscle tone, a feeling of resistance through her limbs and altered facial expression.

## Resident 2 – Postural Management intervention for trial



*Before intervention*

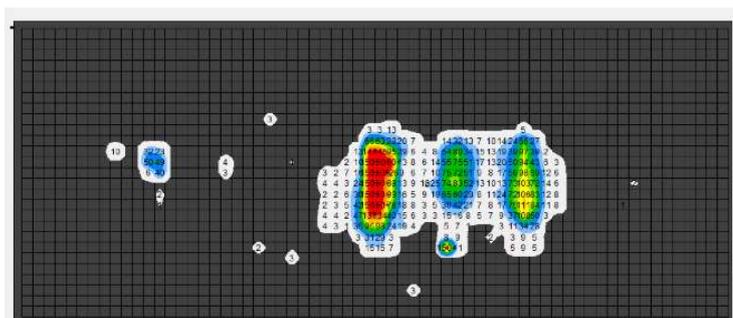


*Resident positioning with Symmetrisleep™ and sticker chart for staff*

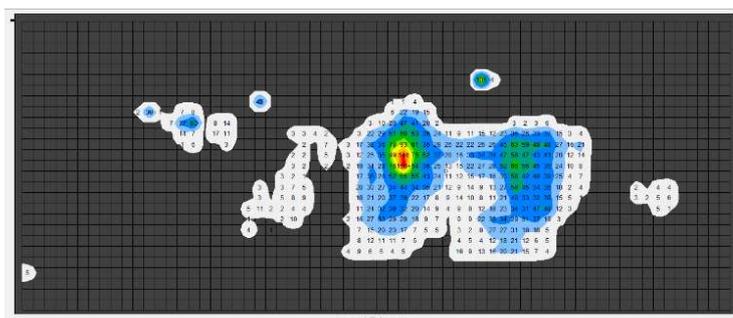
After assessment it was agreed Resident 2 would be issued with 6 components from the Symmetrisleep™ system: 1 x pair medium brackets, 1 x small bracket, 1 x med/large bracket, 1 x 'D' pillow, 1 x 'G' roll cushion and 1 x 'E' Horseshoe cushion. These are Lowzone™ foam-filled cushions with Coolover™ fabric covers to aid temperature regulation.

A simple sticker chart was issued to aid staff with the correct positioning.

Pressure mapping with these components in place shows:



(BEFORE TRIAL)



(DURING TRIAL)

## Resident 2 – Key findings/Summary outcomes:

- Pressure

The pressure mapping readings show a significant improvement in reducing pressure at the pelvis.

The pressure through the right knee was a concern. This was reported to the care team. However, since the start of the trial, no other pressure issues have occurred.

System is used during the night and for additional support during the day.

- Posture

Posture was improved with the pelvis in a more neutral position with less rotation. In a semi-recumbent position her knees are closer to the midline with feet in contact with the supporting surface. Her right hip remains adducted and internally rotated so the focus will be to try to get this closer to midline.

**June 2017** Due to feeling unwell, Resident 2 was found positioned in side lying. Unfortunately, she was positioned closer to one side of the bed and her right knee was pushing against the bed rail. This had caused some redness. However, staff had put a pillow between her legs and her legs, visually, looked less contracted. Resident 2 was repositioned to take the pressure off her right knee. It was noticeable how much easier repositioning was.

***Resident appears ‘much more relaxed’ and is less resistant to passive movements. Whilst previously ‘unseatable’ due to contractures, resident appeared to have a good, neutral position at a recent seating assessment and new seating is on order.***

***Resident now engages more with staff.***

**October 2017** Resident 2 was previously difficult to seat comfortably but her condition has improved sufficiently to now be seated in a specialist chair regularly. There is a significant improvement in her range of movement in leg extension and flexion and improved head control too. Staff have commented on the positive changes they have noticed.

- **Contractures:**

After initial implementation of system an additional pillow was used behind Resident 2's legs. Staff had communicated to the OT that they thought this would be beneficial and this was agreed and added to the recommendations (additional 'C' cushion) for use when tolerated. No complaints were communicated by the resident throughout the trial and the OT noted a 'marvellous' position for the Resident's legs, and a 'wonderful seated position too'.

Her left leg is closer to midline and wind-sweeping has reduced, hence the positive pressure mapping readings. Her right leg is in better alignment and she has an increase in ROM as her pelvis is more neutral.

Following the use of the Sleep system the photograph shows her lower limbs more centrally aligned. By bringing her hips and knees towards the midline her base of support is broader. Hygiene will be carried out efficiently with her hips in a less rotated position.

**June 2017** Range of movement in right knee has improved by 17° and in left leg an improvement of 5°. It was easier to move the Resident and she seemed much happier when repositioned in the sleep system.

**October 2017** Range of movement in right knee has improved by a further 15° and in left leg by a further 4°

***Resident is looking very well and is very comfortable in her Symmetrisleep™ system. She has better head control, spends more time seated in her specialist chair and is now able to watch TV***

# RESIDENT 3

## Personal Details:

Age: 87yrs

Weight: 65kgs

## Brief medical notes:

Vascular dementia

Alzheimer's

Diabetes

Arthritis in neck

Resident 3 is seated in a Single Motor, Tilt in Space, Rise n Recline chair and, at the request of his wife, this is limited to a few hours every morning. He was observed to have slight flexion to his right knee whilst seated so, on OT recommendation, a pillow was placed underneath to accommodate this position. In bed, OT observed that he flexes at both knees at times (probably to support the flexion) and OT recommended pillows behind his knees to reduce risk associated with turning at his hips and eventually adopting foetal position.

Resident 3 is hoisted for all transfers. OT has recently applied for funding for T80 shower chair.

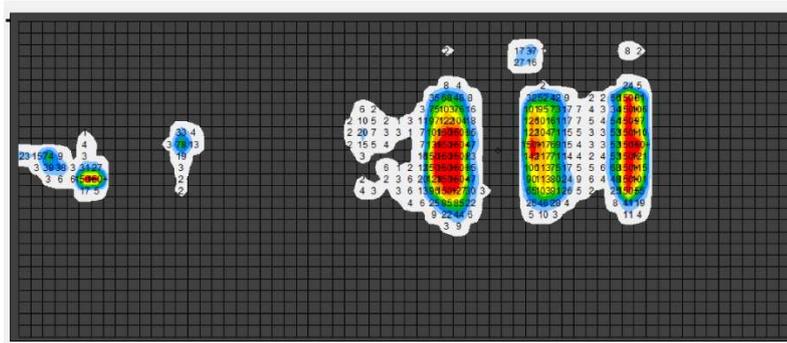
Profiling bed with airflow mattress. Bed dimensions 79x35x37" frame. Same bed used in Workshop training.

Resident 3's wife visits regularly and agreed to attend the Workshop.

## Resident 3: pre-trial – 24.01.17 – Pressure Mapping & Contracture Measurement



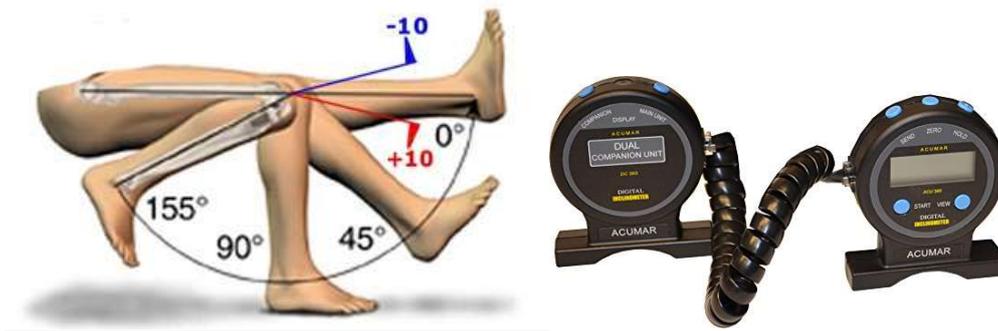
*Initial Resident positioning*



*Initial assessment on current mattress without support.*

## Contracture Measurement chart:

| CONTRACTURE MEASUREMENT |             |             |            |              |              |             |
|-------------------------|-------------|-------------|------------|--------------|--------------|-------------|
| RESIDENT 3              |             |             |            |              |              |             |
| Date                    | Left Rested | Left Flexed | Left Ext'd | Right Rested | Right Flexed | Right Ext'd |
| 24/01/2017              | 12°         | 43°         | 8°         | 23°          | 35°          | 8°          |
| 28/03/2017              | 60°         | 93°         | 28°        | 43°          | 48°          | 21°         |
| 08/06/2017              | 33°         | 135°        | 15°        | 22°          | 112°         | 22°         |
| 04/10/2017              | 68°         | 144°        | 18°        | 45°          | 120°         | 16°         |



## Observations:

Resident 3 prefers a semi-recumbent position.

At assessment his left lower leg was scissored/adducted/internally rotated

Resistance to active assisted movement was identified of a non-neurological type, possibly due to apprehension.

Assisted Flexion of his knee initiated the strongest resistance to movement, which would be a possible explanation for his preference of extended limbs at rest.

**Resident 3 – Postural Management intervention for trial**



*Before intervention*



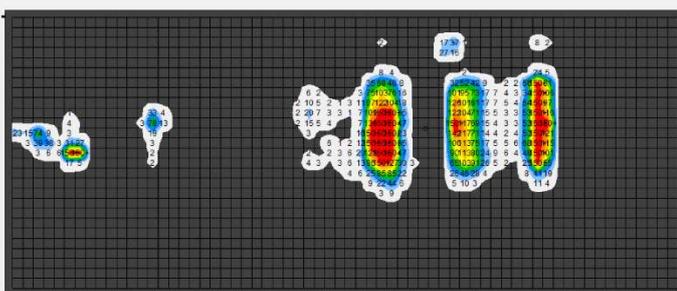
*Resident positioning with Symmetrisleep™ and sticker chart for staff*



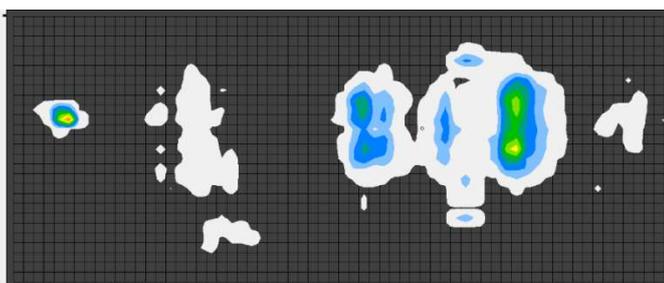
After assessment it was agreed Resident 3 would be issued with 6 components from the Symmetrisleep system: 1 x pair medium brackets, 1 pair x small brackets, 1 x med/lge bracket, 1 x 'D' pillow, 1 x 'G' roll cushion and 1 x 'C' cushion. These are Lowzone™ foam-filled cushions with Coolover™ fabric covers to aid temperature regulation.

A simple sticker chart was issued to aid staff with the correct positioning.

**Pressure mapping with these components in place shows:**



**(BEFORE TRIAL)**



**(DURING TRIAL)**

## **Resident 3 – Key findings/Summary outcomes:**

- **Pressure**

The pressure mapping readings show a significant improvement in reducing pressure at the shoulders, pelvis and thighs.

**June 2017** Due to being much more symmetrical, pressure issues are not a concern. The system is used regularly during the night and for additional support during the day (as of June 2017).

- **Posture**

Posture was greatly improved with a more symmetrical, supine position achieved. Resident 3's legs are not crossed and both are closer to midline, aiding circulation. It was observed that he tended to track down the bed once his legs were no longer crossed due to his need for proprioceptive input.

His pelvis was in a desired neutral position with his hips externally rotated by 15° which is considered a rested state. OT noted less natural adduction of left leg in resting position, making care needs easier and a generally better seated position.

**June 2017** Resident 3 continues to be positioned well. He was found to be less further down the bed and his legs remain uncrossed.

Tone was reduced from 'very high' to 'much more relaxed' and resident is less resistant to passive movements. Gains a good position in level 5 chair. Previous issues with extension in both knees and resistance to flexion have improved (noted when using shower chair).

Family has reported improved social inclusion due to being able to be seated for longer periods and showering. Quality of life has improved and engagement has developed. Resident now responds to conversations with positive facial gestures.

**October 2017** Resident 3's posture has improved well enough that he now spends more time seated

- **Contractures:**

Due to Resident's initial apprehension, the system was to be used when suitable to 'build tolerance'. The contracture measurements show significant improvement in flexion. He did show some reluctance to straighten his legs which could be explained by the use of the pillow beneath. A recommendation would be made to increase staff training as some believed the system to be more beneficial than others.

**June 2017** The range of movement in his left leg has increased by 85° and in his right leg by 63°. By offering a little flexion in rested and offering a more symmetrical position with the Resident's legs uncrossed, Resident 3 is much easier to move, range of movement much improved and he is now much easier to seat out in his comfortable chair.

**October 2017** Resident 3 remains easier to move and his range of movement has improved enough to enable him to sit comfortably for longer periods of time rather than be restricted to staying in bed

# RESIDENT 5

## Personal Details:

Age: 89yrs

Weight: 48kgs

## Brief medical notes:

Advanced stage dementia

History of TIA's

Arthritis

Fractured neck of femur

Atrial fibrillation

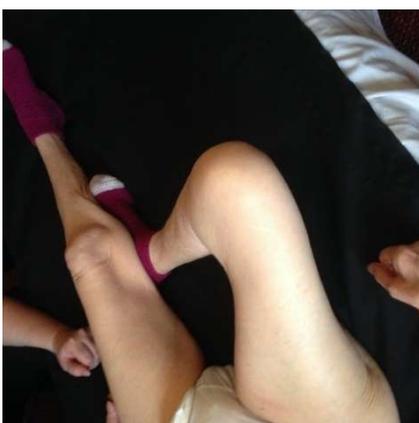
Memory issues and confusion. Resident 5 is unable to communicate her needs and carers are required to pre-empt all care needs.

Resident 5 is seated in a Single Motor, Tilt in Space, Rise n Recline chair; however it is unsuitable and does not meet her needs regarding head and neck postural support. She awaits a more supportive, multi-function comfortable chair with Back Angle Recline, Tilt in Space, Head support and Higher Pressure Relieving chair, approved at Panel. Resident is hoisted for all transfers

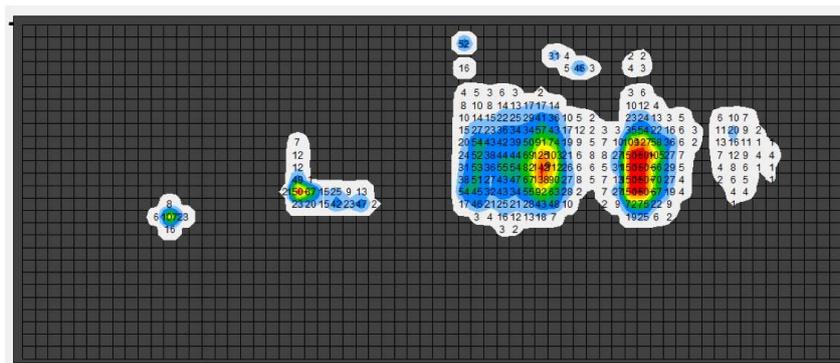
Profiling bed with airflow mattress. Bed dimensions 79x35x37" frame. Same bed used in Workshop training.

Consent for trial gained via daughter who was keen to attend the training Workshop with Resident's other daughter.

## Resident 5: pre-trial – 24.01.17 – Pressure Mapping & Contracture Measurement



*Initial Resident positioning*



*Initial assessment on current mattress without support.*

## Contracture Measurement chart:

| CONTRACTURE MEASUREMENT |                  |                  |                 |                   |                   |                  |
|-------------------------|------------------|------------------|-----------------|-------------------|-------------------|------------------|
| RESIDENT 5              |                  |                  |                 |                   |                   |                  |
| Date                    | Left knee Rested | Left knee Flexed | Left knee Ext'd | Right knee Rested | Right knee Flexed | Right knee Ext'd |
| 24/01/2017              | 13°              | 135°             | 3°              | 80°               | 130°              | 38°              |
| 28/03/2017              | 42°              | 111°             | 15°             | 62°               | 110°              | 35°              |
| 08/06/2017              | 20°              | 159°             | 20°             | 60°               | 115°              | 42°              |
| 04/10/2017              | 30°              | 155°             | 7°              | 94°               | 155°              | 55°              |



## Observations:

Resident 5 was originally assessed in side-lying position on right hand side with pelvic rotation.

She has kyphosis of her thoracic spine and lower cervical spine. Right hip fracture in 2016. Appeared extended at hips with right hip laterally rotated with impact on position of right knee and thigh. Right knee was flexed to approx. 40° and, due to hip rotation her right leg could not be brought to midline position.

Her right hip was externally rotated with straight left leg.

Pelvic support required for neutral position.

Resident 5 communicated some apprehension.

## Resident 5 – Postural Management intervention for trial



*Before intervention*

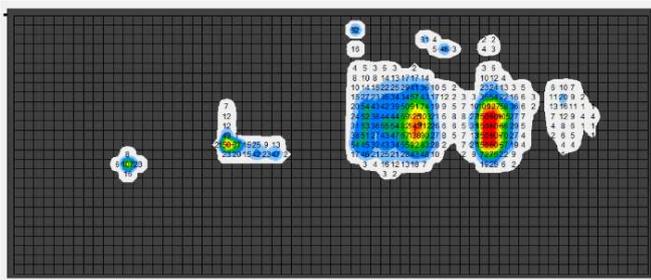


*Resident positioning with Symmetrisleep™ and sticker chart for staff*

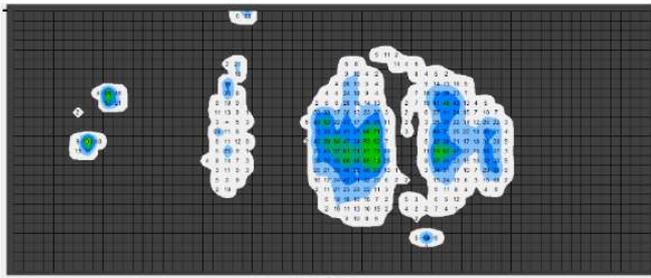
After assessment it was agreed Resident 5 would be issued with 5 components from the Symmetrisleep™ system: 1 x pair medium brackets, 1 x pair small brackets, 1 x med/lge bracket, 1 x 'G' roll cushion and 1 x 'E' Horseshoe cushion. These are Lowzone™ foam-filled cushions with Coolover™ fabric covers to aid temperature regulation.

A simple sticker chart was issued to aid staff with the correct positioning.

Pressure mapping with these components in place shows:



(BEFORE TRIAL)



(DURING TRIAL)

### Resident 5 – Key findings/Summary outcomes:

- Pressure

The pressure mapping readings show a significant improvement in reducing pressure with more even distribution. High risk pressure areas at the shoulders, pelvis and heels were eliminated whilst in the system.

**June 2017** Due to the extended periods of time in bed (we believe up 18 hours in bed each day only getting up for meal times) staff noticed redness and skin issues down the Resident’s spine. This will have inevitably being caused through heat build-up, sweating and an inability to manage temperature through this lack of repositioning. Therefore, the time in supine was changed to be timed each day to just 2 hours, twice a day (4 hours). Issues with Night Staff compliance in putting the system in place (when Resident would be most relaxed and have lower tone), staff training has been identified as a requirement in the future. At this time, there have been no further issues.

**October 2017** Resident 5’s sleep system was removed previously due to TVN (Tissue Viability Nurse) intervention but has been reintroduced for short periods and a significant improvement in pressure has been identified.

- Posture

Posture was greatly improved with symmetrical, supine positioning closer to midline and right knee in neutral with neutral pelvic alignment.

**June 2017** Resident 5 remains in a symmetrical position. Happy and relaxed and it is easy to move the Resident and perform daily tasks such as dressing and hygiene. Carers have noted that the Resident’s appetite has improved and she is much more alert.

**October 2017** Resident 5 remains happy and relaxed

***There is evidence of improved social inclusion, quality of life and engagement.***

***Although the resident cannot communicate with other residents, she will now laugh when others are laughing.***

- **Contractures:**

The change in her body posture affords greater comfort and resident was found to be more trusting with moving and handling, indicated by less resistance and an improved position. Her ability to lie in a more symmetrical alignment improves her balance and helps reduce tone, aiding relaxation. Her left leg when rested was improved but a reduced range was noted when she was uncooperative. There was some flexion measured in her right leg due to resistance to moving and handling. This will be monitored ongoing.

**June 2017** Range of movement in the left leg has improved by 5° and reduced slightly in the right leg by 19°. However, these measurements are very much circumstantial for this Resident as she has always maintained good range of movement. What we can learn from these measurements is that with this project's intervention, a Resident at risk of contractures has benefitted from good positioning and pressure care. This has reduced the likelihood of an onset of contractures.

**October 2017** There is evidence of some improvement in range of movement. G-Roll cushions are being used between her legs and a recommendation has been made to use further cushions to add support.

## RESIDENT 4

### Personal Details:

Age: 72yrs

Weight: 55kgs

### Brief medical notes:

Advanced stage Alzheimers – unable to communicate her needs

Requires carers to pre-empt all care needs. Right-sided neglect.

Resident 4 is deemed not to have capacity and has been appointed an advocate as she has no known family or friends.

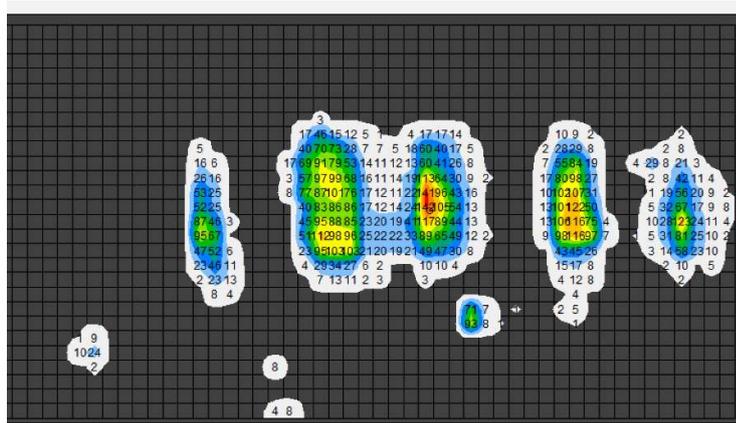
Profiling bed with airflow mattress. Bed dimensions 79x35x37” frame. Same bed used in Workshop training.

OT was consulted by Symmetrikit and a second opinion from a Physiotherapist was sought regarding suitability for research as Resident 4 is unable to be seated and has limited ROM. It was previously thought she would be an unsuitable participant.

### Resident 4: pre-trial – 24.01.17 – Pressure Mapping & Contracture Measurement



*Initial Resident positioning with standard polyester cushions*



*Initial assessment on current mattress without support.*

## Contracture Measurement chart:

| CONTRACTURE MEASUREMENT |           |           |            |            |            |             |
|-------------------------|-----------|-----------|------------|------------|------------|-------------|
| RESIDENT 4              |           |           |            |            |            |             |
| Date                    | Left Rest | Left Flex | Left Ext'd | Right Rest | Right Flex | Right Ext'd |
| 24/01/2017              | 85°       | 130°      | 49°        | 147°       | 106°       | 80°         |
| 28/03/2017              | 86°       | 123°      | 95°        | 147°       | 146°       | 66°         |
| 08/06/2017              | 78°       | 145°      | 69°        | 154°       | 142°       | 49°         |
| 04/10/2017              | 75°       | 135°      | 90°        | 87°        | 120°       | 75°         |



### Observations:

Resident 4 was bed bound. Semi-side lying on right hand side.

She had pelvic rotation to the left.

Her right lower leg was adducted, externally rotated with right knee flexed under left thigh. Her left hip was flexed at 45 degrees with left knee adducted and flexed.

## Resident 4 – Postural Management intervention for trial



Before intervention

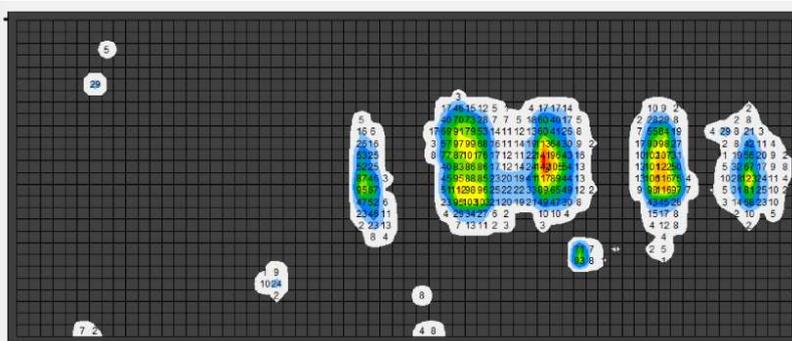


Resident positioning with Symmetrisleep™ and sticker chart for staff

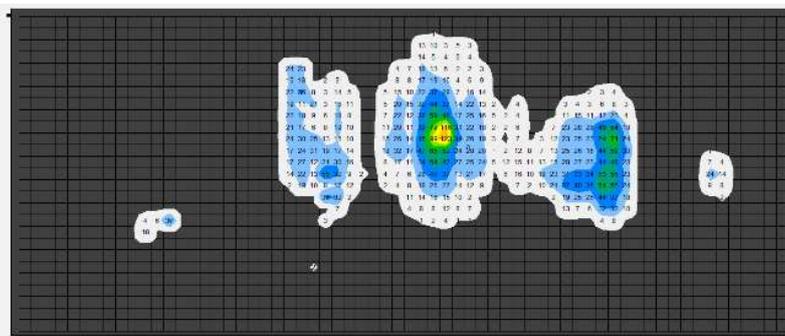
After assessment it was agreed Resident 4 would be issued with 5 components from the Symmetrisleep™ system: 1 x pair medium brackets, 1 x 'D' pillow, 1 x 'G' roll cushion, 1 x 'C' cushion and 1 x 'E' Horseshoe cushion. These are Lowzone™ foam-filled cushions with Coolover™ fabric covers to aid temperature regulation.

A simple sticker chart was issued to aid staff with the correct positioning.

Pressure mapping with these components in place shows:



(BEFORE TRIAL)



(DURING TRIAL)

## **Resident 4 – Key findings/Summary outcomes:**

- **Pressure**

The pressure mapping readings show an improvement in reducing pressure with more even distribution.

**June 2017** Resident 4 had developed a head wound in early May (not as a consequence of the project). However, due to this issue, positioning had been in different positions until the pressure issue had cleared. Carers were continuing to support her legs with pillows from the sleep system. No other pressure issues reported.

There had been some difficulty in ensuring carers used the system consistently and discussions had followed regarding concerns over possible shear/friction with the Coolover™ sheet although this was confirmed as not the case.

***One carer did report that the initial results of the trial were ‘so inspiring’ as personal care tasks became easier to manage.***

- **Posture**

Proposal for initial set-up was for support in supine although Resident’s preference for side-lying meant short-term intervention in this position was preferable, with close supervision from OT team. Her pain level was difficult to determine so slow-graded process was essential. The semi-recumbent position means her right leg is flexed and rotated with left hip flexed and adducted.

**June 2017** Resident 4 was found to be positioned in a more rotated, asymmetrical position than that had been recommended. In reviewing likely causes for this, it was decided to simplify the system set up. The sticker chart was changed and staff trained on the new set up.

**October 2017** Resident t 4 has improved positioning from the hips down, facilitated by repositioning some of her sleep system and appears to be much more relaxed

- **Contractures:**

As of 28.03.17 the sleep system had been removed due to staff disquiet regarding resident comfort and only a roll cushion was being used between the knees. There was a historical query regarding a possible fracture or dislocation of right hip.

Resident 4 was moved to supine and the right leg moved in to crook lying. She was resistant to this new position with a palpable increase in muscular tone for a short while (possible 40 seconds.) She quickly settled and became more relaxed and stayed in this new alignment for 10mins.

OT recommendation to implement this new alignment for 10mins daily to build tolerance, and gain confidence. The aim being to reduce apprehension and therefore tone, thus gradually improving body symmetry.

**June 2017** Despite inconsistencies with positioning, the Resident had not changed much from the initial starting point of the project in relation to her rested position. Range of movement in the left leg since the last measurement would suggest a considerable improvement. However, at the last measurement, the resident was much less relaxed and measurements now suggest little improvement in the left leg since start of the project. However, in the right leg, there has been a continued improvement in her range of movement to as much as 67° since the start of the project.

**October 2017** Left leg flexion would have been further improved had it not been for Resident 4’s hip de-rotation. Her range of movement in both legs is reduced but in a rested position she has noticeable improvements in her right leg.

***Resident presents as much more relaxed and is much less resistant to intervention***

# RESIDENT 6

## Personal Details:

Age: 89yrs  
Weight: 76kgs

## Brief medical notes:

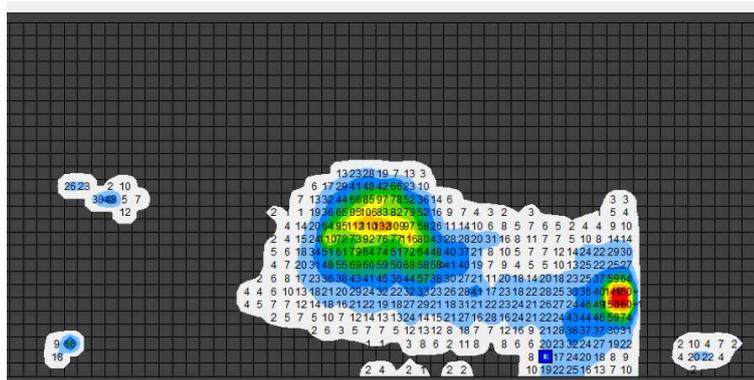
- Alzheimers
- Schizo-affective anxiety
- Recurrent depressive disorder and significant anxiety
- Asthma and prone to chest infections
- Recurrent UTI's
- Eczema and prone to skin tears

Resident 6 is able to follow simple instruction when she chooses to cooperate and responds better to male carers. She has been assessed for a Single Motor, moderate pressure relieving and Tilt in Space Rise n Recline chair as she requires postural support, pressure relief and assistance to stand. Profiling bed with airflow mattress. Bed dimensions 79x35x37" frame. Same bed used in Workshop training.

## Resident 6: pre-trial – 24.01.17 – pressure mapping & contracture measurement



Initial Resident positioning



Initial assessment on current mattress without support.

## Contracture Measurement chart:

| CONTRACTURE MEASUREMENT |             |             |            |              |              |             |
|-------------------------|-------------|-------------|------------|--------------|--------------|-------------|
| RESIDENT 6              |             |             |            |              |              |             |
| Date                    | Left Rested | Left Flexed | Left Ext'd | Right Rested | Right Flexed | Right Ext'd |
| 24/01/2017              | 31°         | 96°         | 30°        | 47°          | 106°         | 34°         |
| 28/03/2017              | 79°         | 100°        | 32°        | 90°          | 118°         | 36°         |
| 08/06/2017              | 66°         | 90°         | 30°        | 79°          | 120°         | 33°         |
| 04/10/2017              | 79°         | 90°         | 30°        | 90°          | 106°         | 38°         |



### Observations:

Resident 6 was seated at first assessment.

In lying she was in side-lying on left hand side on point of left hip. Her left shoulder was rotated due to this lying position.

Her left lower leg was flexed at the hip and knee and her right hip was flexed. Her right foot was dangling, inverted and unsupported.

## Resident 6 – Postural Management intervention for trial



*Before intervention*

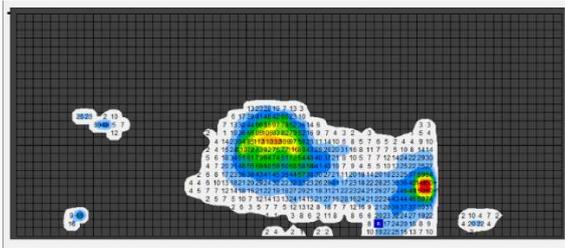


*Resident positioning and sticker chart for staff guidance*

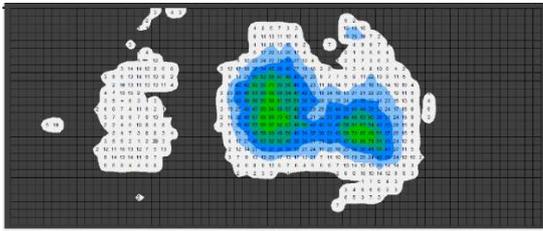
After assessment it was agreed Resident 6 would be issued with 3 components from the Symmetrisleep™ system: 1 x pair medium brackets, 2 x med/lge brackets and 1 x 'D' pillow. These are Lowzone™ foam-filled cushions with Coolover™ fabric covers to aid temperature regulation.

A simple sticker chart was issued to aid staff with the correct positioning.

Pressure mapping with these components in place shows:



(BEFORE TRIAL)



(DURING TRIAL)

### **Resident 6 – Key findings/Summary outcomes:**

- **Pressure**

The pressure mapping readings show an improvement in reducing pressure at the shoulders.

There have been no pressure issues reported

- **Posture**

Posture was greatly improved with symmetrical, supine positioning closer to midline and legs in neutral with neutral pelvic alignment.

**June 2017** The staff report having issues with continuity. Night staff are reported to not be using the system while day staff do so inconsistently. This is a good example of how motivation can reduce if there are inconsistencies with application. As a result, the Resident is noticeably more rotated at the chest – rotating to the left. Her legs also sit with a ‘windswept, configuration, also to the left.

- **Contractures:**

Resident 6 was initially resistant to the position of the system but progress was made with time in the system limited to short periods.

As of 28.03.17 she was measured whilst in a seated position, in posterior pelvic tilt or slump. Her knee movements were limited in this alignment due to a stretch on her hamstrings.

Had she continued for longer periods in the sleep system we would hope to achieve a further improved, supported alignment in supine lying. The aim would be to gain a whole body comfortable alignment which reduces load and to support her lower limb. This leg was previously held in mid-air which has a high cost to energy output.

Support of her whole body would aid pressure relief and resistance to gravity and therefore be less tiring.

**June 2017** - There has been a 6° reduction in range of movement in the left leg and a 13° improvement in the right leg. However, this was expected as the resident lies in left side lying and is not being repositioned. The left leg’s range of movement has reduced as the right leg migrates across the top of the left leg in lying. Due to the left leg’s reduction in range of movement, this Resident has become far less mobile. Care staff have been retrained and the system to be used has been further simplified. The Care Home Manager was very concerned to hear of this deterioration and will be addressing staff training needs to ensure continuity.

# RESIDENT 7

**Personal Details:**

Age: 84yrs  
 Weight: unknown (kgs) – BMI 25

**Brief medical notes:**

Atrial fibrillation, hypertension and Osteoporosis

Previous TIA

Anaemia and Myasthenia Gravis (ocular)

Hypothyroid, high cholesterol and postural hypotension

Long-term catheter in situ

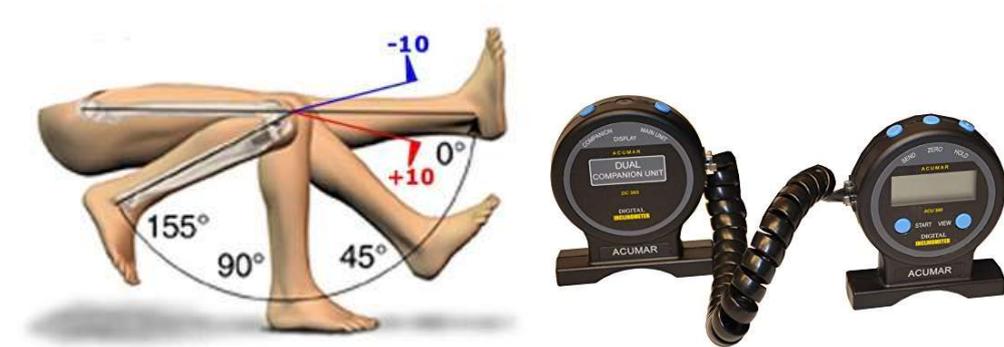
Resident has a postural tilt-in-space chair with back angle recline and foot support in situ although staff reluctant to moving and handling due to ongoing issues:

Recurrent chest infection, hyperemesis with subsequent hospital admission Feb 2017. Intermittent nausea exacerbated by moving and handling.

**Resident 7: pre-trial – 24.01.17 – pressure mapping & contracture measurement**

**Contracture Measurement chart:**

| CONTRACTURE MEASUREMENT |             |             |            |              |              |             |
|-------------------------|-------------|-------------|------------|--------------|--------------|-------------|
| RESIDENT 7              |             |             |            |              |              |             |
| Date                    | Left Rested | Left Flexed | Left Ext'd | Right Rested | Right Flexed | Right Ext'd |
| 22/02/2017              | 162°        | 113°        | 124°       | 10°          | 144°         | 0°          |
| 28/03/2017              | 112°        | 127°        | 92°        | 19°          | 153°         | 0°          |
| 08/06/2017              | 105°        | 147°        | 124°       | 21°          | 150°         | 5°          |
| 04/10/2017              | 120         | 161         | 101        | 60           | 160          | 5           |



## Observations:

Resident 7's left lower leg was flexed at the hip and knee, and held in this position.

She communicated some apprehension and her tone was heightened possibly due to this.

## Resident 7 – postural management intervention for trial



*Resident positioning*

## Resident 7 – Key findings:

- **Pressure**

As of June 2017 it was the OT's understanding that the system had not been used in the previous weeks and recommendations are to be made to 'simplify' the system following a full review.

- **Posture**

As a result of the system not being used, the Resident's posture was observed to be 'much the same'.

[October 2017](#) Posture has improved significantly by de-rotation of left leg/hip and a more mid-line position

- **Contractures:**

As above

[October 2017](#) Improvements in the range of movement in both legs can be measured. A horseshoe cushion is used under her left leg to help with hip de-rotation. Better posture and level of comfort

***Resident 7 has now been provided with a new chair which allows for good positioning of her leg and hip and she is using this chair regularly with the addition of a foot stool. Spending less time in bed and appears happy and comfortable.***

# RESIDENT 1

## **Personal Details:**

Age: 81yrs

Weight: 52kgs

## **Brief medical notes:**

Rheumatoid arthritis

Osteoarthritis

Spinal Neuritis

Historical anaemia

Some memory issues and confusion.

Historical left hip replacement – Resident reports that this is 'still broken'.

As of 10.10.16 left knee contracted to approx. 80°.

Limited capacity – Resident appears able to make decisions such as what she would like for lunch and communicate if she would like a drink.

Bed-care as refuses to be hoisted into seating.

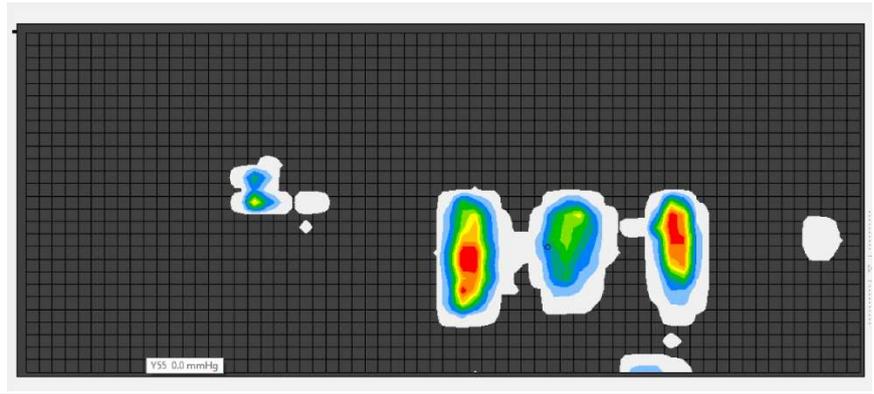
Profiling bed with airflow mattress (resident hates this mattress). Bed dimensions 79x35x37" frame. Same bed used in Workshop training.

OT will consider specialist seating due to negative angle of 65° to better support contracted leg position if Resident agrees to being hoisted. If her left leg contracture reduces, the OT would anticipate resident could manage a standard Queen Anne-style chair in the first instance.

Resident 1 requires AO2 for support with positioning in bed and visit has been arranged with Social Worker to complete best-interest assessment regarding her consent to the research (12.01.17).

Resident is regularly visited by a friend/neighbour however, on the OT advice, he was not invited to the Workshop due to previous conflicts regarding the Resident's care.

## Resident 1: pre-trial – 24.01.17 – Pressure Mapping & Contracture Measurement

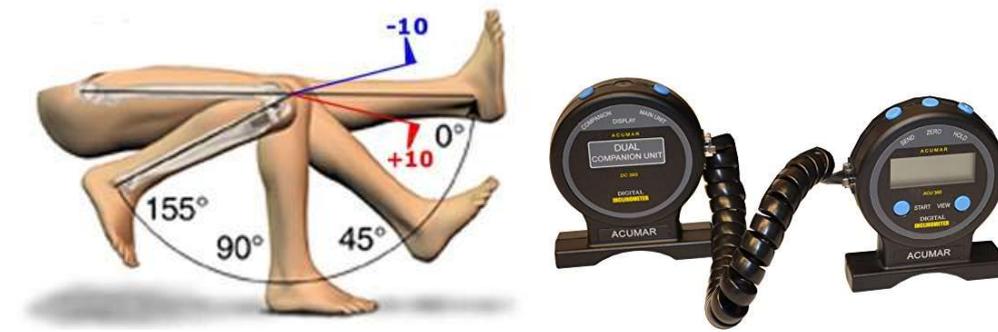


*Initial assessment on current mattress without support.*

*Initial Resident positioning*

### Contracture Measurement chart:

| CONTRACTURE MEASUREMENT |             |             |            |              |              |             |
|-------------------------|-------------|-------------|------------|--------------|--------------|-------------|
| RESIDENT 1              |             |             |            |              |              |             |
| Date                    | Left Rested | Left Flexed | Left Ext'd | Right Rested | Right Flexed | Right Ext'd |
| 24/01/2017              | 95°         | 89°         | 92°        | 66°          | 143°         | 65°         |
|                         |             |             |            |              |              |             |
|                         |             |             |            |              |              |             |
|                         |             |             |            |              |              |             |



## Observations:

Resident 1 is bed-bound and slides down the bed.

At assessment she was kyphosed and flexed with pelvis in status quo and neutral

Her right knee extended with some active resistance.

She was tender on palpation of the origin of her right hamstring and lacked full extension due to apprehension and or pain.

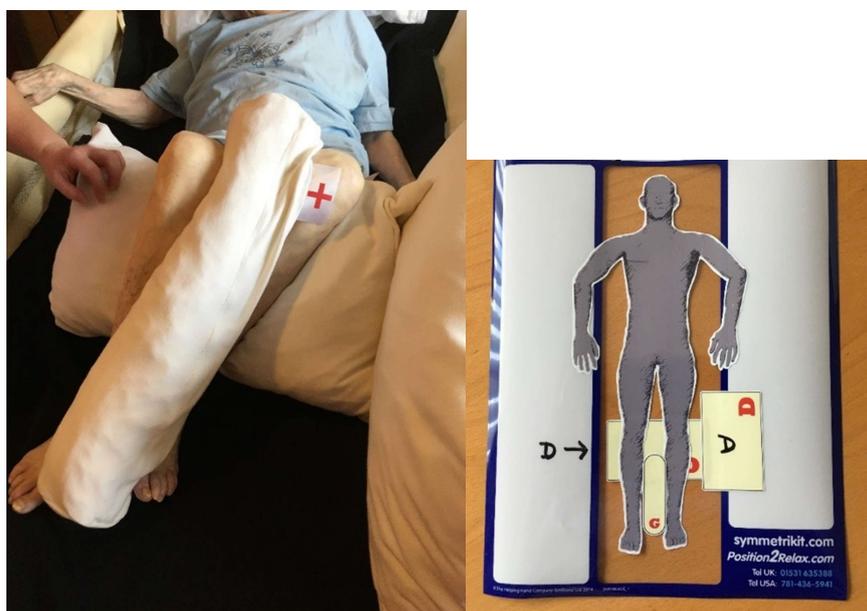
Her left knee maintained a full range of flexion.

She had tight hamstrings and TOP insertion.

## Resident 1 – Postural Management intervention for trial



*Before intervention*

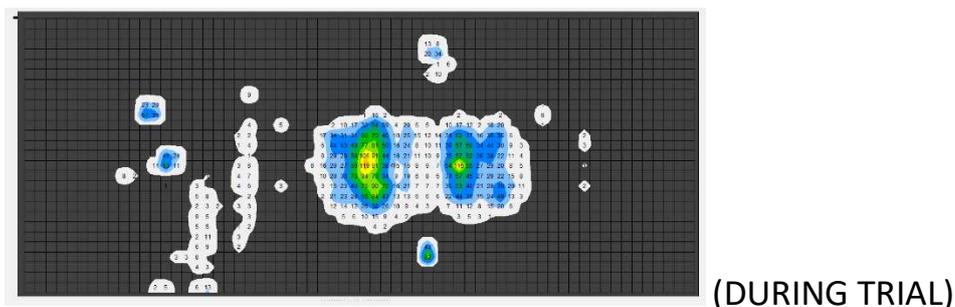
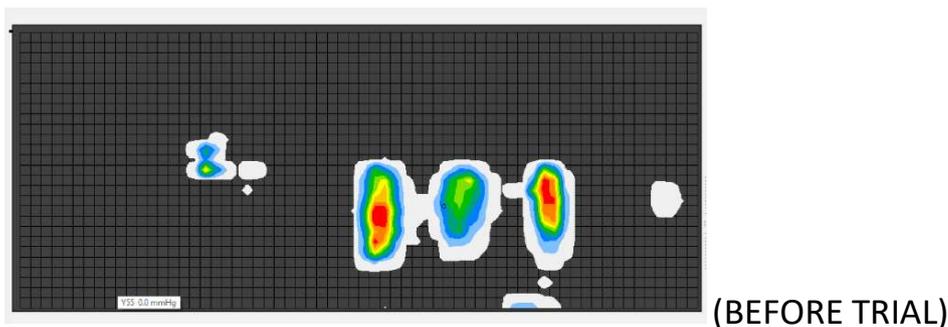


*Resident positioning with Symmetrisleep™ and sticker chart for staff*

After assessment it was agreed Resident 1 would be issued with 3 components from the Symmetrisleep™ System: 2 x 'D' pillows and 1 x 'G' roll cushion. These are Lowzone™ foam-filled cushions with Coolover™ fabric covers to aid temperature regulation.

A simple sticker chart was issued to aid staff with the correct positioning.

Pressure mapping with these components in place shows:



### Resident 1 – Key findings/Summary outcomes:

- **Pressure**

At the initial assessment, the pressure mapping readings showed a significant improvement in reducing pressure at the shoulders and pelvic/thigh areas with more even pressure distribution at the trunk.

- **Posture**

Posture was shown to improve with semi side-lying position changed to supine and moving towards the midline.

- **Contractures:**

Unfortunately, a second contracture measurement was not taken due to the Resident leaving the trial, at her own request, before the system could be implemented. Other interventions regarding complex moving and handling issues and her anxiety and general mental health meant the resident felt unable to take part in the trial.

At a further review in June 2017, this situation will be reassessed and, if she agrees, the system will be reintroduced in stages as the previous evidence indicates she would benefit significantly from continued reduction in pressure.

## Conclusions.

The results suggest that the implementation of a 24-hour Postural Management programme in a Care Home environment can result in the reduction of contractures and improvement in quality of life and ease of care.

It is recognised, however, that a significant investment in staff training and subsequent consistency of intervention is required for successful outcomes. Middlesbrough Council have already invested in further postural care training for Health Professionals.

Following this trial, 6 of the 7 residents continue to benefit from a 24-hour Postural Management programme and progress will be monitored so that this report can be updated in the future.

The clinical evidence from the trial has enabled the clinicians to continue working with residents in Care Homes in a preventative manner to manage their posture over a 24 hour period in the most effective way. Similar positive outcomes are being recorded in other care homes as the work continues.

There is a need for services to be delivered in a more innovative way in response to the postural problems and associated health issues experienced by residents in care homes. The evidence demonstrated that people are benefitting from 24 hour postural care management and taking a proactive approach is cost-effective and beneficial to both the individual and care establishment.

**Further information about the research can be obtained from the Project Leaders, Kim Owens and Gemma Daly from Middlesbrough Social Care.**

## Appendices:

Appendix A – Contracture Management trial - Permissions letter Jan'16

Appendix B – Contracture Measurement record sheet Jan'16

## References

<sup>1</sup> Brightwater Care Group Full Report - <http://www.symmetrikit.com/downloads>

<sup>2</sup> Symmetrikit Family and Carers Workshop - <http://www.symmetrikit.com/downloads>

## Bibliography

Wagner, Laura & Clevenger, Carolyn. (2010). Contractures in Nursing Home Residents. Journal of the American Medical Directors Association. 11. 94-9. 10.1016/j.jamda.2

Kwah, Li Khim & Harvey, Lisa & Diong, Joanna & D Herbert, Robert. (2012). Half of the adults who present to hospital with stroke develop at least one contracture within 6 months....

Skalsky & Mc Donald(2012) . Phys Med Rehabil Clin N AM 2012 Aug; 23(3):675-687

Harrington (2000) The regulation and Enforcement of federal Nursing Home Standards. 1991-1997. Medical Care REasearch and Review, Jan 2000

Jamshed & Schneider (2010) Are joint contractures in patients with Alzheimer's disease preventable? ManagedHealthcareconnect.comssue: [Volume 18 - Issue 8 - August, 2010](#)