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Evaluation of Night Time Therapeutic Positioning System for adults with complex postural problems

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Chapter 1: Background to the evaluation

The purpose of this study is to evaluate the effect of night-time positioning sleep systems for adults using the Simple Stuff Works Limited® system. A combination of quantitative and qualitative methods were used to assess the impact on a variety of factors; pain, physiological observations, oxygen saturation, nutrition and fluid intake, weight, Waterlow risk score, sleep score, choke risk score, skin integrity, comfort and quality of life.

The project objectives were to:

- Evaluate the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment).
- Evaluate the equipment used in night-time positioning.
- Assess the impact of night-time positioning on activities of daily living.
- Measure the difference between pain, sleep scores, physiological observations, oxygen saturation, nutrition and fluid intake, weight, Waterlow risk score, choke risk score, skin integrity, comfort and quality of life before and after the intervention.

The role of the company in the study was to provide the equipment. An independent clinician assessed the participants sleep system equipment requirements, demonstrated the first fitting and drew up the plan of care when using the equipment.

Ethical approval to conduct the study was sought and granted by the University of Salford Ethics committee (see appendices, for the letter of approval).

Chapter 2: Literature Review

People with complex health requirements are often subject to changes in body shape because of lying in one position for extended periods, which can result in body profile distortions (Crawford and Stinson 2015; Hill & Goldsmith 2010). The ramifications of these distortions can be colossal in terms of basic physiological functioning such as breathing, digestion and circulation and in extreme circumstances death (Innocente 2014; Waugh and Hill 2009). Whilst there is no specific definition of night time positioning equipment (NTPE) it can be described as aligning the body in a comfortable non-destructive position in bed using a sleep system.

There is a lack of specifically designed equipment available for postural management with the aim of promoting normal posture in people with complex physical disabilities. This encourages function, addresses deformity and motor ability (Humphreys and Poutney 2010). As most adults spend seven to eight hours lying in bed at night an incorrectly aligned sleeping position can have a negative impact on their body shape (Cary, Collinson, Sterling, and Briffa 2016; Collins 2007). Commercially available products to address body shape distortion when lying include night-time positioning systems which vary, from offering rigid support to flexible support (NHS Buyers Guide 2009). When laying the body is less influenced by muscle tone, making it more susceptible to the corrective forces this equipment proffers (NICE 2016). A review of the evidence base on the impact that night time positioning systems have on improving health and function during the day is limited (Robertson, Baines, Emerson, and Hatton 2018). Historically the evidence base for night time positioning has been contextualised within children's services (Pountney, Mulcahy, Clarke, and Green 2004) with the Chailey Heritage Foundation leading the way. However, many health professionals and researchers advocate further studies are required with adult participants who have complex postural asymmetries (Robertson et al. 2018; Crawford and Stinson 2015; Innocente 2014)

The NHS Buyers Guide (2009) reports that there are six, night-time positioning systems available, but this does not include positioning aids such as bean bags or shaped cushions. A wide variety of materials are used such as: foam covered wooden supports; glide and lock memory foam pads; cushioned guides; rigid padded brackets with rolls. Despite having the right equipment available, environmental and personal factors can act as barriers to using

the equipment such as: skills and knowledge of the carer(s), ease of use of equipment, and time constraints (Maher, Evans, Sprod, and Bostock 2010). The importance of postural interventions is noted in Crawford and Stinson's (2014) 'Management of 24 hr-Body Positioning' to maintain body position for function. For the purposes of this study a variety of Simple Stuff Works equipment was used, such as padded lateral supports, soft fibre wedges, horseshoe pillows and supine stabilisers (see appendix 2). Individual assessments were completed by an independent physiotherapist to ascertain which equipment would be necessary for each participant.

There is little robust published evidence, which evaluates the use of sleep systems. One notable exception is a Cochrane systematic review which found two small, low quality randomised control trials that addressed this important issue in children (Blake et al. 2015). However, a literature survey has found no peer reviewed evidence evaluating the effect of night-time positioning systems in adults.

This research is the first of its type and will provide Simple Stuff Works with an independent empirical assessment of the impact of their system in adults. This study takes a two arm approach. Firstly it will address the effect of night time positioning equipment in adults in a community residential/nursing home facility that are at risk of further postural deformity. The study also addresses the impact of night time positioning on activities of daily living and quality of life. Secondly the study evaluates the knowledge and skills of care staff in the delivery of night time positioning.

Chapter 3: Methodology

Research Design

The purpose of this study is to evaluate the effect of night-time positioning sleep systems for adults using the Simple Stuff Works system.

The project objectives were to:

- Evaluate the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment).
- Evaluate the equipment used in night-time positioning.
- Assess the impact of night-time positioning on activities of daily living.
- Measure the difference between pain, physiological observations, oxygen saturation, nutrition and fluid intake, weight, Waterlow risk score, choke risk score, skin integrity, comfort and quality of life before and after the intervention.

A small-scale evaluation study using a mixed methods approach with adults who have complex postural requirements was conducted. The research was both quantitative and qualitative in nature:

- Qualitative data using:
    - a semi structured interview schedule to explore in more detail the resident participant responses to the use of the night-time repositioning equipment;
    - focus groups for care home staff participants to explore in more detail their opinion on the use of the night time repositioning equipment.
    - nursing observations of the participants on the use of the night time repositioning equipment.

- Quantitative data collated will include: Measurement of:

    - Pain - Visual Analogue and Abbey et al. (2004) Pain Scales
    - Sleep Score – Pittsburgh Sleep Score (Buysee et al. 1988)

- Oxygen saturation
- Physiological observations
- Nutrition and fluid intake,
- Skin integrity –NPUAP, EPUAP, PPPIA (2014) categories
- Waterlow (1988) Score
- Weight
- Choke Risk of resident participants
- Change in medication
- Care Home staff pre-test, post-test knowledge of posture

Recruitment

Organisational agreement for the project was obtained by the researchers who had already engaged with the Nurse Manager, Medical Director and Lead Nurse at the nursing home about potential collaborative working. A previous alumnus who is now the Lead Nurse, had expressed an interest to be involved in any potential research studies. The researchers approached the Lead Nurse once ethical approval was granted in order to explore the viability of conducting the study and the necessary process of gaining approval and provisional support for the study. Sample recruitment for resident and staff participants into the research study included:

1. A poster on the care home notice board.
2. A letter to residents and next of kin/guardian.
3. Lead nurse discussions with residents and next of kin/guardian.
4. Lead nurse discussions with registered staff.

Participants

Residents

Twelve residents were recruited to the study using an inclusion and exclusion criteria. The sample population were drawn from a care home of n= 40 residents and who have complex postural requirements.

Inclusion criteria:

- Participants over the age of 18

- Participants must have complex postural requirements.
- The participants must be non-weight/partial bearing
- May or may not have a previous pressure ulcer
- To be able to give informed consent/assent (residents with cognitive deficits).
- To be available to participate in the study for twelve weeks.

Exclusion criteria:

- Participants under the age of 18.
- Participants without mobility problems.
- Current users of prescribed night time positioning equipment.
- Participants who have nocturnal seizures,
- Participants who have gastro-oesophageal reflux.
- Participants who have chest infections.
- Participants who have sleep apnoea (Chung et al. 2010).

All care home staff were invited to participate in the study (n= 34).

Twelve resident participants is deemed appropriate for a pilot study as there are no previous studies to provide a benchmark and limitations on the sample size will be acknowledged. According to Connelly (2008), existing literature suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. However, Hertzog (2008) cautions that this is not a simple or straight forward issue to resolve because these types of studies are influenced by many factors. Nevertheless, Isaac and Michael (1995) suggested ten to thirty participants; Hill (1998) suggested 10 to 30 participants for pilots in survey research; Julious (2005) in the medical field, and van Belle (2002) suggested twelve.

Procedure

Care Staff

Potential participants were given time to consider their involvement in the study. They were encouraged to discuss their involvement with the lead nurse. Participants were advised that

they were able to withdraw from the study at any time without reason or prejudice. Withdrawal from the study would not affect their work life and anonymity was guaranteed. Once recruited to the study a member of the research team explained the study to the staff, gaining informed consent and a date was set to receive training on night-time positioning and use of the equipment.

Prior to and post training the staff participants completed a questionnaire to assess their level of knowledge in regards to night-time positioning.

Residents

Potential participants were given time to consider their involvement in the study. They were encouraged to discuss their involvement with a member of the research team, carer or family member. Participants were advised that they were able to withdraw from the study at any time without reason or prejudice. Withdrawal from the study would not affect their access to care and anonymity was guaranteed. Potential participants with reduced mental capacity were invited to participate by the Lead Nurse discussing the study with the relatives or appropriate legal representative as recommended by the MRC (2007) and RCN (2011).

Once the participants were recruited to the study, applying the inclusion and exclusion criteria, a mutually agreed date was identified to commence the evaluation. A member of the research team explained the study to the resident/next of kin/guardian and gained informed written consent. Baseline assessments were completed (demographic information, gender, age, measurement of pain score, sleep score, oxygen saturation, physiological observations, choke risk assessment, Waterlow score, weight, nutrition and fluid intake and skin integrity, of the residents During the trial period weekly communication between the researchers and lead Nurse from the care home took place to provide updates and support. Data collection was repeated at the end of the twelve-week evaluation period. A semi structured interview was undertaken which was recorded digitally. The researchers contacted the company to arrange delivery of any night-time positioning equipment which was supervised by the researchers to limit external independent variables such as company influence.

Data collection tools

- Photographs pre and post night-time positioning intervention.
- Validated pain tool (Abbey et al. 2004) Pain Score and numerical rating scale.
- Oxygen saturation
- Physiological observations
- Nutrition and fluid intake charts
- Weight
- Pressure Ulcer Classification Tool (NPUAP, EPUAP, PPPIA, 2014)
- Pittsburgh Sleep Quality Index (Buysee et al. 1988)
- Waterlow Risk Assessment
- Choke Risk Score
- Pre-training, post-training knowledge of the staff on use of night time positioning and equipment
- Qualitative feedback from semi structured interviews for residents/next of kin/guardian which was digitally recorded.
- Qualitative focus group for staff (digitally recorded).

Data Analysis

Residents

Results were analysed using SPSS v 24 to:

i) Summarise the mean/standard deviation for demographics.

ii) Compare Pain Score, Weight, Waterlow Score, Choke risk score, Sleep score in order to measure any effect from the use of night time positioning equipment at week 0 and week 12.

Outcomes measuring food and fluid intake, medication changes, physiological observations, saturation of oxygen, and skin assessment were considered and changes represented as percentages where appropriate.

A detailed thematic analysis using a recognised Burnard's (2000) stepped analysis process was used to analyse the transcribed verbatim comments and feedback regarding effect of

night-time positioning equipment on quality of life and activities of daily living. This stepped approach provides an opportunity to ensure a transparent and auditable account of the data analysis process was followed

Registered nursing staff

Results were analysed using SPSS v 24 to:

- Compare staff knowledge, pre training and post training.

A detailed thematic analysis using a recognised Burnard's (2000) stepped analysis process was used to analyse the transcribed verbatim comments, from the focus groups, regarding the effect of night-time positioning training and equipment. This stepped approach provides an opportunity to ensure a transparent and auditable account of the data analysis process was followed.

Role of the company in the research

The company involved in the research delivered the equipment for the duration of the study. An independent clinician completed:

1. Delivery of staff training on the use of night-time repositioning equipment
2. Assessment of the participants for the type of sleep system equipment required.

During the study, the company were not able to promote their products, nor analyse any data. The only benefit perceived was that the findings will be used by the company for marketing purposes.

Chapter 4: Findings

The purpose of the project was two-fold: to evaluate the effect of night-time positioning Sleep systems for adults using the Simple Stuff Works system, and evaluate the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment).

Quantitative Data

Resident Participants

Ten out of the twelve resident participants completed the study (two resident participants died during the evaluation).

Staff participants

Four staff participants completed the training programme; however three months later one member of staff left to work in another care home.

Demographics

Resident participants

There were four male and eight female participants, aged from 51 – 89 years of age, with an average age of 79.6 years. Six had a diagnosis of a cerebrovascular accident, four had dementia and all had comorbidities. Eight participants were nursed on an alternating dynamic mattress and two on a pressure reducing foam mattress (see figure 1 and table 1).

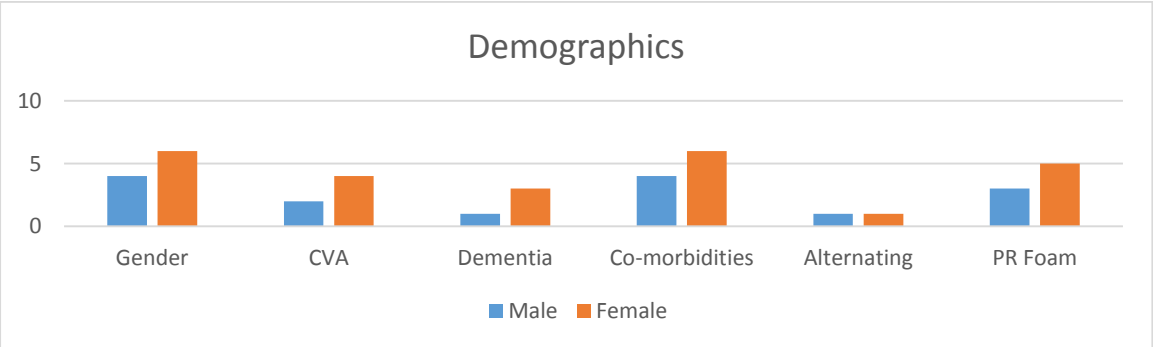

Figure 1: Demographics by gender/medical condition

Participant Number	Age	Gender	Past Medical History
1	89	F	CVA (L sided weakness), Asthma, Hypertension
3	68	F	CVA (R sided weakness), Aphasic, Depression
4	84	F	CVA, Advanced Dementia, AF, IHD
5	86	F	Advanced Dementia
6	84	M	CVA (R Sided weakness), Pernicious anaemia, Registered Blind
7	88	M	Dementia, Right above knee amputee, Hypertension, PVD, CKD ST3
8	83	F	CVA (L sided weakness), Depression, AF
9	77	M	Advanced Parkinson's

10	86	F	Dementia /STML, Arthritis to both knees
12	51	M	CVA (R sided weakness), craniotomy, STML, Drug and Alcohol abuse, Epilepsy.

Table 1: Demographics of resident participants

Staff participants

There were three female and one male staff participants who completed the training programme, aged between 28 and 63 years and had worked at the home between 15 months and 13 years.

Equipment Prescribed versus equipment tolerated and used frequently

From the equipment prescribed for the ten participants who completed the study, the pieces of equipment used and tolerated most frequently includes neck support pillow, horseshoe shaped temperature regulating pillow, soft fibre wedges (large and small) and sausage pillow. From this study, none of the participants used the fitted sheets, supine stabiliser, lateral supports and soft fibre foot supports prescribed. All maintained use of their standard cotton sheets with the equipment throughout the study. Only one participant declined to use all of the equipment prescribed.

Observations

Observations of blood pressure, pulse rate, respiratory rate, and saturation of oxygen were recorded at week zero and week twelve (see table 3). 30% of participants recorded a lowering of their blood pressure, 20% of participants a lowering of their pulse rate and respiratory rate. Marginal changes were observed in all the participants.

Participant	Blood Pressure		Pulse		Respiratory rate		SaO2	
1	135/67	132/62	73	71	22	20	98	97
3	122/69	122/72	62	59	19	16	95	97
4	116/73	121/72	84	72	20	18	93	96
5	150/84	132/67	77	67	16	18	94	96
6	142/74	135/62	61	62	17	18	98	97
7	109/64	112/71	74	66	17	19	95	93
8	114/65	102/66	66	76	19	27	96	95
9	148/74	123/63	78	48	16	17	94	92
10	115/66	141/74	65	60	16	16	98	98
12	130/103	128/86	73	83	16	17	96	96

Table 3: Physiological Observations

Pain Score

Pain scores reveal that 60% of the participants demonstrated a reduction in pain by week twelve of the study and the remaining 40% had no pain (see table 4). At week zero P1 had severe pain in her right shoulder and leg and at week twelve the pain in the right shoulder had dissipated and pain in the right leg had diminished to five. P6 pain score radiating from the sacrum had decreased to one by the end of the trial. P9 pain score was three at week zero and had dissipated by week twelve. P10 began the study with a pain score of seven located in the lumbar spine, neck, knees and legs. By the end of the study the pain was located only in the knees and reduced to a score of five. P12 initially had a pain score of eight in the right shoulder and a score of eight in the left arm and shoulder. By week twelve pain in the shoulders and left arm had diminished and a pain score of five was located in the lumbar spine.

Participant	Pain score (Week 0)	Pain score (Week 12)
1	10	5
3	0	0
4	0	0
5	4	0
6	3	1
7	0	0
8	0	0
9	3	0
10	7	5
12	8	5

Table 4: Pain scores

Sleep Score

Sleep scores reveal that 70% of the participants demonstrated an improvement in their sleep scores by week twelve of the study and the remaining 30% of participants had no change (see table 5).

Participant	Sleep score (Week 0)	Sleep score (Week 12)
1	12	12
3	9	4
4	8	8
5	13	12
6	14	11
7	8	7
8	14	9
9	13	12
10	12	10
12	11	11

Table 5: Sleep Scores

Weight

Weights of the resident participants expose that 50% of the participants demonstrated an increase in their weight by week twelve of the study, 30% a decrease and the remaining 20% had minimal change (see table six).

Participant	Weight (Week 0)	Weight (Week 12)
1	58.4	58.3
3	56.6	58.6
4	47.8	41.6
5	49	42.1
6	58.4	61.1
7	47.6	53.2
8	92.8	101.4
9	75.3	72.9
10	53.8	57.2
12	86.7	86.9

Table 6: Weight

Choke Risk

Choke risk scores decreased for 50% of the resident participants by the end of week twelve. Whilst the other 50% remained the same (see table seven).

Participant	Choke Risk (Week 0)	Choke Risk (Week 12)
1	109	91
3	96	86
4	62	62
5	68	68
6	61	61
7	52	42
8	6	6
9	18	10

10	38	28
12	52	52

Table 7: Choke Risk

Waterlow Score

60% of resident participants saw a reduction in their Waterlow Risk Score by week twelve. The other 40% of participants scores remained constant (see table eight). All participants started and completed the study with skin intact.

Participant	Waterlow score (Week 0)	Waterlow score (Week 12)
1	23	19
3	18	17
4	29	29
5	24	24
6	26	25
7	31	26
8	24	22
9	28	26
10	24	24
12	19	19

Table 8: Waterlow Score

Food/Fluid intake

There were variances between food and fluid intake for all of the participants, some of who had a deteriorating medical condition (participants five and six) (see table nine). Most noticeable were Participant three who started the study with a Percutaneous Endoscopic Gastrostomy Feed and ended the study independently consuming a normal healthy diet. Participant nine started the study requiring continuous assisted feeding due to posture whilst seated/lying in bed. By week twelve he was able to sit unaided and feed himself bacon on toast and drink a cup of tea.

Participant	Food	Fluid intake	Food	Fluid intake
	Week 0		Week 12	
1	2 Weetabix, Chicken Dinner and Potato Soup, Cake and cream.	1400	2 Weetabix Fish, mash, peas. Soup and sandwich; cake and cream	1350
3	PEG Feed	1700	Porridge, bowl of soup, cake and cream *(PEG removed)*	1950
4	No breakfast, chicken and mash, small cake and custard; soup, apple pie and cream	700	3 spoons porridge; Leek and potato soup, semolina; Fish, mash, peas and ice cream.	650
5	Porridge, mince and onion pie; soup and chocolate cake	1000	Yogurt, porridge; pureed chicken dinner and yogurt; Leek and potato soup. Chocolate mousse.	420
6	Porridge; macaroni cheese and veg, chocolate cake and sauce; soup.	1400	3 pureed soft meals	600
7	Weetabix; beef mash and veg; soup	1100	2 x Weetabix; purred meal for lunch; leek and potato soup and	720

			chocolate mousse	
8	Toast and marmalade; gammon, potatoes and veg, pears and custard; soup and ice cream	2010	Toast and marmalade; corned beef hash, sweets and biscuits; sausage and mash, lemon cake, sweets and biscuits.	2500
9	Porridge and toast; Spanish chicken; soup and sandwich. *(Assisted feed)*	1300	Marmalade sandwich; bacon sandwich; sausage and mash, peaches and ice cream; omelette and chips; lemon cake. *(Self/assisted feed)*	1800
10	Egg and bacon on toast; Spanish chicken; soup and sandwich.	2100	Toast and marmalade; sausage mash and peas, peaches and cream; soup and sandwich.	1800
12	Cornflakes, Soup and roll.	2100	Cornflakes, soup and roll	2100

Table 9: food and fluid intake

Other observations

Depression scores

It was noted by the staff participants that 30% of the resident participants had a decrease in their Depression Scale scores (Sheikh and Yesavage 1986; Alexopolous, Abrams, Young and Shamoian 1998) at the end of the study period. This correlated with

Participant Number	Depression Score		Depression Scale used
	Week 0	Week 12	
1	12	7	Geriatric Scale
3	7	3	Cornell Scale
8	12	10	Geriatric Scale

Table 10: Depression scores

Medication changes

Analgesia medication was reduced or discontinued in 40% of the participants. Participant one had asthma medication reduced over the study period and by the end of the study was no longer required. Participant seven no longer experienced phantom leg pain. 20% of participants saw a reduction in laxative medication by the end of the study.

The mean/standard deviation for the demographic data

Descriptive statistics were calculated using IBM SPSS v24 for all participants for the following demographics: weight, Waterlow, choke risk, sleep score, pain score. The results are found in table ten. The results show a mean increase for weight and an improvement in the mean sleep scores after the study. There was a decrease in pain, Waterlow and choke scores on completion of the study. A large standard deviation for weight and choke scores were expected due to the small sample size and a large variance in the sample population

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
weight before study kg	10	47.60	92.80	62.6400	16.43791
weight after study kg	10	41.60	101.40	63.3300	18.89209
Pain before study	10	.00	10.00	3.5000	3.71932
Pain after study	10	.00	5.00	1.6000	2.36643
Sleep score before study	10	8.00	14.00	11.4000	2.31900
Sleep score after study	10	4.00	12.00	9.6000	2.63312
Waterlow score before study	10	18.00	31.00	24.6000	4.11501
Waterlow score after study	10	17.00	29.00	23.1000	3.78447
Choke score before study	10	6.00	109.00	56.2000	31.47062
Choke score after study	10	6.00	91.00	50.6000	29.15552
Valid N (listwise)	10				

Table 11: Descriptive statistics weight, pain, choke, sleep, Waterlow.

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	weight before study kg - weight after study kg	-.69000	4.89068	1.54657	-4.18858	2.80858	-.446	9	.666
Pair 2	Pain before study - Pain after study	1.90000	1.85293	.58595	.57450	3.22550	3.243	9	.010
Pair 3	Sleep score before study - Sleep score after study	1.80000	1.93218	.61101	.41780	3.18220	2.946	9	.016

Pair 4	**Waterlow score before study - Waterlow score after study**	1.50000	1.77951	.56273	.22701	2.77299	2.666	9	.026
Pair 5	**Choke score before study - Choke score after study**	5.60000	6.44981	2.03961	.98609	10.21391	2.746	9	.023

Table 12: Paired sample t-test of weight, pain score, sleep score, Waterlow Score and choke score. NB: * significant at P<0.05

Results from the quantitative data analysis show:

- There was no significant difference in the participants' pre study weight (m=62.64kg) to post study weight (m=63.33kg).
- There was a significant decrease in the participants' pre study pain score (m= 3.50) and post study pain score (m=1.60).
- There was a significant increase in the participants' quality of sleep; pre study sleep score (m=11.40) and post study sleep score (m=9.60). (A higher score on the Pittsburgh Sleep Quality Scale indicates lower sleep quality).
- There was a significant decrease between pre study (p=24.60) and post study (m= 23.10) Waterlow scores. This indicates that participants' risk of pressure ulcer development decreased during the study.
- There was a significant decrease between pre study (m= 56.20) and post study (m=50.60) choke scores

Staff participant's pre training and post training scores

All staff participants self-reported scores increased post training apart from within knowledge of identification of need.

Issue	Pre test					Post test				
	SP1	SP2	SP3	SP4	Mean	SP1	SP2	SP3	SP4	Mean
Identification of Need										
1.	4	4	4	4	**4**	4	4	3	4	**3.75**
2.	2	3	1	2	**2**	3	4	3	4	**3.5**
3.	3	4	3	4	**3.5**	3	4	3	4	**3.5**
4.	2	2	3	2	**2.25**	4	4	3	4	**3.75**
5.	1	2	2	2	**1.75**	4	4	3	4	**3.75**
Supine lying (on your back)										
1.	1	2	2	2	**1.75**	4	4	3	4	**3.75**
2.	2	2	2	1	**1.75**	4	4	3	4	**3.75**
3.	2	2	1	2	**1.75**	4	4	3	3	**3.5**
4.	1	2	1	2	**1.5**	4	4	3	4	**3.75**
5.	1	2	1	2	**1.5**	4	4	2	4	**3.5**
Side lying										
1.	2	2	2	3	**2.25**	4	4	3	4	**3.75**
2.	2	2	2	2	**2**	4	4	3	4	**3.75**
3.	2	2	1	2	**1.75**	4	4	3	3	**3.5**
4.	1	2	1	2	**1.5**	4	4	3	4	**3.75**
5.	1	2	1	3	**1.75**	4	4	2	4	**3.5**
Lying in prone										
1.	1	2	2	2	**1.75**	4	4	3	4	**3.75**
2.	1	2	2	2	**1.75**	4	4	3	4	**3.75**
3.	1	1	1	2	**1.25**	4	3	2	4	**3.25**
4.	1	2	1	2	**1.5**	4	3	3	4	**3.5**
5.	1	1	1	2	**1.25**	4	3	2	3	**3**
Understanding safety issues										
1.	3	4	1	2	**2.5**	4	4	3	4	**3.75**
2.	1	4	1	2	**2**	4	4	3	3	**3.5**
3.	1	4	1	2	**2**	4	4	3	3	**3.5**
4.	1	1	1	1	**1**	4	4	2	4	**3.5**
5.	2	4	1	3	**2.5**	4	4	3	3	**3.5**
Using Simple Stuff Works Equipment										
1.	2	3	1	2	**2**	4	4	3	4	**3.75**
2.	1	3	1	1	**1.5**	4	4	3	3	**3.5**
3.	1	4	1	2	**2**	4	4	3	4	**3.75**
4.	1	4	1	2	**2**	4	4	3	4	**3.75**
5.	1	1	1	2	**1.25**	4	4	3	4	**3.75**

Table 13: Staff participant's self-reported knowledge, skills and attitude scores

Qualitative data

A detailed thematic analysis using a recognised Burnard's (2000) stepped analysis process was used to analyse the qualitative comments and feedback regarding nursing observations and participants thoughts in regard to the equipment used. A number of the residents had cognitive impairments which meant that their understanding of the questions was limited.

However this was accounted for in the ethics application with relatives and staff contributing where necessary. This stepped approach provides an opportunity to ensure a transparent and auditable account of the data analysis process.

The qualitative data has been divided into two segments.

1. Recurring themes on the impact of equipment on resident participant's activities of daily living
2. The knowledge and skills of care staff in the delivery of night-time positioning

1. Impact of equipment on activities of daily living

Sleep

70% of the participants demonstrated an improvement in their sleep scores by week twelve of the study and the remaining 30% of participants had no change. A staff member reported that participant four "*tends to sleep for longer periods at night.*" Whilst participant nine "*so, he's having a better sleep and he's staying in a position supported because he rolls, so his posture is being improved" (*staff comment). The relative of participant nine stated "*I think he's sleeping better….relaxation feeling and laying in a good position."* Participant one stated that the equipment, specifically the horseshoe pillows "*helps me sleep*." Staff reported that participant one becomes upset if the equipment is removed for washing as she has become reliant on it for getting comfortable for sleep.

Posture

For 80% of the participants, posture is featured in their feedback. Participant ten recalled the difference between using ordinary pillows prior to the study and the horseshoe pillow during the study " *they've got more support*" this was expanded upon by the staff "*I think using the horseshoe has kept her straighter. Cos when it was just a pillow on that side her legs sort of migrated to the left."* Participant seven and his relative recalled how the equipment offered support to his shoulders and leg "*because I think it's straightening him more, instead of pushing his leg over."* Comments on posture were expressed by staff in the

focus groups "*Yeah, because normally they can be slouched down, even though it doesn't matter how much … you prop up the bed and everything……. as with the banana cushions, straight away, you sit them up, you pack them on this side, put the wedge there and they just stay. So yeah, I love them, I think they're amazing."* Two participants (P3, P9) had clinically significant changes in their posture, illustrated in appendix 3.

Support

Recurring feedback about the equipment was centred around the horseshoe shaped pillows, wedges (all sizes), neck supports and the supine stabiliser. 90% of the resident participants gave positive feedback about the support from the horseshoe shaped pillows, wedges (all sizes) and neck supports. General comments such as supporting their arms/shoulders, holding the head in a better position, stopping the participants leaning and staff have started to use the equipment generally instead of pillows "*For me, having the equipment has made life a lot easier, as before we would be packing them with cushions and pillows and things like that, whereas now we have the equipment, which is a lot better for them"* (staff member). The supine stabiliser was abandoned by all of the resident participants who were prescribed it, with the consistent comment "*it's too restrictive.*" This was supported by staff members who found that it was restrictive and interfered with nursing care "*I think the problem with the knee and the leg supports, a lot was to do with toilet, going, using the toilet during the night" and "It was impractical….. and we're all bothered about our bowels and bladder and that was what they did, which put them off*."

Pain

From the staff participant focus groups a reduction in analgesia taken by resident participants was attributed to the regular use of the equipment. *"…if someone's in pain we'll change the position and then we'll say 'do you want some paracetamol? Whereas now the equipment is doing that and saving the cost of paracetamol.*" Participant one, when asked about the pain in her right shoulder and leg replied *"….I'm not in pain…..my arm's not*

hurting….cos I'm warm and my head's not hurting." Participant ten reported that the pain had decreased as a consequence of using the horseshow pillow under her knees.

Temperature

70% of the participant residents made comments about the temperature when using the equipment. All of the participants commented about the warmth or heat from the equipment. There were no comments regarding the equipment making participants feel cold. When asked whether they felt too hot or cold using the equipment participant seven replied "*It's ideal*" and participant one expressed that the equipment was "*nice and warm…not too warm*." Participant ten commented that the equipment was "quite warm" but did not express this in a negative way. Care staff expressed that the temperature that the equipment generated did not affect participant four and "*that it's not overheating her*," the staff member then went on to clarify this by stating that participant four would relax and sleep and she would not do this if she was over heated. Three of the participants felt that the equipment made them feel too hot and this affected their usage of it. Participant eight abandoned the equipment as she felt it was making her feel too hot and participant two stated that it made her sweat and feel "*hot all over*." Feedback from the staff focus group supported what the participants said in terms of the heat generation, however one staff member pointed out that the home was generally quite hot and staff should consider the environment and regulating the temperature for example opening the windows.

Function

Participants and staff commented on the effect of the equipment on their everyday function. Four of the participants (P1 P3 P7 P9) had a specific positive increase in their function as a result of using the equipment. Participant three was nursed in bed at the start of the study and by week twelve was tolerating siting out in her wheelchair for a good proportion of the day in the day room, directly attributable to using the equipment "*There's quite a big difference in how much that tucked up leg can stretch out now.*" Participant three was peg fed at the start of the study and by the end of the evaluation she was taking food orally. Staff commented that participant three had recently gained weight and is eating better.

Participant seven had seen a noticeable improvement in his functional occupations, he was able to watch TV and interact with his wife, playing games such as dominoes, which he was not able to do before, "*(wife) mentioned that you had an opportunity to watch television and play dominoes."* The equipment had a very positive effect on participant nine's function especially in terms of eating meals and drinking "*when he's sat up more, he can do his own drink."* Prior to the study participant nine would sit in a bent position with his head facing the floor, this made function difficult, especially feeding. Participant nine was observed by the researchers at the end of the study feeding himself breakfast (toast, bacon) and drinking tea independently. Participant one commented that the equipment was helping with her breathing as it was supporting her head "it's lifting my head up a bit, helping me breath more." Visible changes for participant three and nine can be found in appendix 3.

Aesthetics

Feedback from participants and staff was favourable in relation to how the equipment was perceived. Participants commented on the feel of the equipment "nice and soft" and "ideal in shape and size." Staff commented on the material being terry towelling which most older people could relate to "*I think it's a nice fabric, the older generation are used to the flannelette sheets and I think in that respect it's better than a cotton fabric*" One participant (P10) commented that the fabric was "nice to touch." The equipment was also easy to wash and maintained its shape "*it washes easy enough, seems to come back still in, it's not ruined by the washing."* A general consensus of opinion was noted form all participants in relation to the supine stabiliser and the foot supports which were not used by the participants due to their size and the restriction they caused.

Comfort

80% of the participants and staff made comments relating to comfort. Most participants and staff observations categorised the comfort in terms of 'relaxation' and 'peace'. Participant one described the comfort as making her feel "*calm and relaxed*" and when asked further

she explained that the feeling of comfort from the equipment was *"I'm pleased…..at peace with myself."* Participant eight's comfort was also related to feeling relaxed. Comfort for participant four was relayed by the staff who observed "*she looks peaceful, she looks relaxed… Yeah she just does look as though she can just drop off and be asleep with the equipment in place*." For participant seven comfort was shown in his quality of sleep, when asked to clarify what comfort meant he stated "*just general routine of sleeping.*" For participant nine the feeling of comfort was explained by the observation made by staff "*he looks much more comfortable now.*" Staff observed comfort in the participants' non-verbal facial gestures and behaviour. Participants five and eight were both unable to tolerate the equipment as they found it too uncomfortable. However a staff participant reflected "*if she'd had the softer laterals I think she would have benefited more from that*."

2. <u>The knowledge and skills of care staff in the delivery of night-time positioning</u>

Two staff focus groups were conducted at the end of the trial period to elicit feedback regarding the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment) before and after the duration of the study. Themes that emerged were *training, impact, attitudes and commitment*.

Training

All staff reported that training proved to be one of the most important factors for them "*it has such an impact on our learning and development…..using the equipment safely can improve quality of life*" (SP3). At the start of the study, a number of staff members attended official training regarding posture and the use of night-time positioning equipment. Other staff members who did not attend lamented their non-involvement. All stated that training of all staff members should be compulsory and new staff can also be trained *"we can train them and make them look and think out the box and not just look at positional change for pressure relief" (SP3).* Staff training has helped in identifying posture issues with new residents "*we automatically identify what posture issues, using the tool chart, to identify if they've got significant posture issues and see what we can do and using the equipment on*

them to improve their quality of life so it's that continuous using of the equipment" (SP7). Some staff reported the challenge for all staff to use the equipment when they had missed the training and the importance of training, specifically trying out the equipment to facilitate its use with the participants "*You got the feeling of how it felt without the cushions in, and then the benefit of the cushions being in with you. So you were able to feel it yourself, not just observe it*" (SP4).

Impact

Comments from the staff focus groups identified the impact of the study on their roles and responsibilities "*it's not just a paper exercise of ticking off change the posture. It's more of an exercise I'm doing this because, well such and such have always got to be able to sit up and eat better and eat more*" (SP6). Staff were able to see the difference that the equipment had on the resident participants and how this had influenced them when new residents arrived *"we've had a few new admissions on to the unit and the care staff have come in and I'll say 'oh I think this piece of equipment would really suit this person*" (SP5). Impact was also relayed in terms of how the staff were using their new knowledge and skills to provide a more holistic person centred approach to the residents "*I think it's made them look at the person than actual just doing it task orientated…. think out the box like this person's not sitting upright and they could be in pain. Instead of using pharmaceutical products such as paracetamol, pain relief, let's use the equipment and reduce the cost*" (SP7). Staff observed that the equipment has had an impact on all of the participants who used it. Some showed slight changes "*you can see the slight changes and just even if they're saying they're not in pain when they're sitting up*" (SP3). A more powerful impact was observed particularly on three of the residents "*you've seen huge, dramatic…if you think about from what point it they was at when they started to what point they're at now you've seen the huge difference which is great. That's brilliant*" (SP6).

Attitudes

At the start of the study staff admitted that not everyone could see what the study would bring which came from a lack of understanding in regards to the study. This led to ambiguity amongst some of the staff regarding the equipment "*it's just been difficult to try and maintain complete consistency when only half the workforce had been trained*" (SP3). One particular staff member found it difficult at the beginning to see that the equipment was not a restraint and declined to use the equipment with one particular resident. By the end of the study when the results were observed she "*reflected on her practice and actually thought, you know she's seen the difference*" (SP3). The staff member had also become proactive in using the equipment with one particular resident participant she was working with "*her approach and her mind set has completely changed from the start to finish*" (SP6).

Comprehension

This theme arose from the comments received specifically in regards to practice constraints as only a small proportion of staff attended the training programme. This led to confusion and misunderstanding regarding the equipment use with the perception of restraint of participants being a major concern. The supine stabiliser was perceived as too restrictive with a comment from staff participant three *"…then at the beginning we are using the equipment they don't actually see, they feel like we're restraining the people*" and (SP7) "*I think that was the biggest problem wasn't it, that the fact a lot of people were using the word restraint and restraining without understanding."* Staff participant three described one reason for this was "*they don't know what research is and I think they should have had that understanding that underpinned knowledge of what research is*." However, staff participant seven attributed the carers' lack of understanding regarding appropriate use of equipment to communication issues at staff handover time with night and day shift staff not relaying the equipment use by resident participants during the night. This was supported by staff participant five who commented that "*staff may be reluctant to put it in (equipment) in case they put it in wrong*." This issue was overcome by incorporating the equipment use into the handover and having easily accessible pictorial care plans.

Chapter 5: Discussion

The purpose of this study was to evaluate the effect of night-time positioning sleep systems for adults using the Simple Stuff Works system.

The project objectives were to:

- Evaluate the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment).
- Evaluate the equipment used in night-time positioning.
- Assess the impact of night-time positioning on activities of daily living.
- Measure the difference between pain, physiological observations, oxygen saturation, nutrition and fluid intake, weight, Waterlow risk score, choke risk score, skin integrity, comfort and quality of life before and after the intervention.

It is acknowledged that there is a dearth of evidence to support the use of night time positioning sleep systems. The evidence that is available is limited in number and pertains to children only (Blake et al. 2015). Researchers in the field are calling for more empirical evidence to demonstrate the benefits of a co-ordinated approach to twenty four hour postural management (Crawford and Stinson 2014). Evidence based practice is defined as the conscientious, explicit and judicious use of theory derived, research based information to make decisions about care delivery to individuals or groups of patients, taking into consideration individual needs and preferences (Barker 2010, p.5). In regards to night time positioning this would require practitioners to review the literature on current products available and their impact on the individuals posture and quality of life. This limits the potential for inappropriate prescription and ultimately equipment abandonment with a negative impact on cost, user quality of life, and unmet needs (Verza, Lopes Carvalho, Battaglia and Messner Uccelli 2006).

1. Evaluate the equipment used in night-time positioning on activities of daily living and QOL.

Of the twelve participants recruited to the study, ten completed the evaluation. From the quantitative findings in this study, it was demonstrated that there were notable clinical

effects on pain, sleep, weight, choke risk, Waterlow, food/fluid intake, depression score, medication, and analgesia. The NHS buyers guide (2009) state that, for children the objectives of the use of night time positioning equipment (NTPE) are to improve function, communication, and quality of life. Even though the NHS buyers guide reflects provision for children the objectives relate to our study in adults. The authors can only draw on limited evidence and expert opinion in relation to children where some of the outcomes in terms of bodily functions in NTPE support the findings in this study. Crawford and Stinson (2015) recognise the importance of NTPE on body systems and quality of life. However Blake et al. (2015) in a Cochrane systematic review state that there was no effect for NTPE on sleep quality or pain in children. It is important to recognise that this information came from two randomised trials and due to the lack of data collated in this review, Blake et al. (2015) called for more research. The evidence surrounding sleep quality and respiratory function in children was investigated in a pilot study (Hill et al. 2009) and the findings for the effect of NTPE on sleep quality and ventilatory function were inconsistent. However in our study the use of NTPE on the ten adult participants demonstrated a positive effect on bodily functions. This was illustrated with participant three who moved from peg feed to oral feeds and could tolerate sitting longer in the wheelchair to participate socially in the home. This is supported by Innocente (2014) who postulates that NTPE can have appositive impact on occupational performance. Tolerance of equipment is vital if it is going to have an impact on the person's posture and ultimately quality of life. In children appropriate equipment is used to directly impact body structures such hip dysplasia (Innocente 2014), chest symmetry and hip protection (Hill and Goldsmith 2010). Concordance with equipment can sometimes be an arbitrary decision based factors such as aesthetics (Bartley and Stephens 2016) and ease of use (Bartley and Stephens 2017). These factors can be client, medical, equipment, assessment and training related (Wielandt and Strong 2000). In this study participant agreement to use the equipment related to client and training related issues such as perceived heat generated when using the equipment, feeling restricted, aesthetics and staff training.

2. Evaluate the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment).

From a total of 34 staff, four attended the pre study training session. A confounding variable to understand why a small number attended can be attributed to attendance at the training being voluntary to comply with ethical considerations and respecting the rights of research participants (Corti, Day, and Backhouse 2000). Another key factor was practice constraints as nursing staff were unable to leave their duties to attend. The importance of training in postural management is evident in the literature (Maher et al. 2010; Crawford and Stinson 2014; Hill and Goldsmith 2010; Goldsmith 2000). In our study staff who attended the training found that it was important as it helped them identify posture issues with the residents. They also found that the training helped them understand how to use the equipment safely. At the end of the study they could relate this to helping to improve the quality of life for the resident participants. This was also reflected in the pre and post training scores demonstrating an increase in self-reported knowledge, skills and attitudes after the training programme. Training has been shown to provide insight into the rationale for postural care and recognising postural problems (Castle et al. 2014). For the staff that did not attend the training initial ambiguity, and mediocre attitudes regarding the benefits for resident participants and motivation to use the equipment was observed. Staff reflection in the focus groups highlighted the idea of 'train the trainer.' This method of training would have helped in terms of continuity as one of the staff participants left the organisation part way through the study reducing the number of trained staff. Maas, Kelley, Park and Specht (2002) explored issues of conducting research in nursing homes and found that key elements that affect the success of a study include; staff members understanding the research process, motivation of staff and incentives to participate such as believing that the study will improve quality of care of residents. To address the potential effect of low staff motivation the researchers conducted weekly phone calls to ascertain updates and offer guidance with regard equipment use. This is shown to promote communication and reinforce the important role of staff in the successful completion of research (Mass et al. 2001). Initially staff that did not attend the training did not comprehend the use and benefits of the equipment. This was addressed with cascading of information and care plans to inform them of the correct way to use the equipment and its benefits. This method of

training has limitations in that transmission and misinterpretation of information can be missed (Fiske and Ladd 2004), however, this was overcome by inclusion of the resident participants' use of equipment during nursing handover. Overall, a positive impact was observed amongst the staff which was relayed in the focus groups. This was demonstrated in their confidence and competence to apply their new knowledge and skills in recognising postural requirements of new residents to the home.

Chapter 6: Limitations

In this study the sample size was small meaning that the results cannot be extrapolated to a wider population. However a sample size of twelve resident participants is deemed appropriate for a pilot study as there are no previous studies to provide a benchmark in terms of sample size. In a pilot study 10% of the sample population is appropriate (Connelly 2008). The nursing home had a resident population of forty people. The self-selecting staff sample for training can be considered a limitation as the views of those who did not participate could be different from those who attended. Staff and relatives who gave qualitative feedback from residents who lacked mental capacity could be seen to bias the study by representing their own views rather than those of the participants. The use of nursing home staff to collect some of the data such as observations and food and fluid intake could influence the results by incorrectly inputting data leading to inaccurate or incomplete records. The use of focus groups and interviews to collect data could lead to response bias, acquiescence and extreme responding (MacDonald 2008)

Confounding variables such as the residents keeping the equipment on cessation of the study ended and the staff using the equipment when the researchers were not present cannot be excluded.

Chapter 7: Conclusion

This chapter concludes the report and makes clear recommendations as to next steps and the way forward, taking into account what has been found in this study and the implications for future manufacturing of Simple Stuff Works equipment. This project sought to evaluate the impact of night time positioning equipment and staff training programme on the posture and quality of life of adult residents living in community nursing home. This seven month pilot study used a mixed methods approach to elicit opinions, views and objective data to answer the call for an examination of the use of NTPE over the age of 65 years in nursing/residential care (Innocente 2014). Although this is a pilot study the results contribute to the urgent need for robust empirical studies to ascertain how best, NTPE can be used to improve the health and QOL of older people. The project objectives have been met, it was intended to establish:

- An evaluation of the knowledge and skills of care staff in the delivery of night-time positioning (with and without equipment).
- An evaluation of the equipment used in night-time positioning.
- An assessment of the impact of night-time positioning on activities of daily living.
- The measured difference between pain, physiological observations, oxygen saturation, nutrition and fluid intake, weight, Waterlow risk score, choke risk score, skin integrity, comfort and quality of life before and after the intervention.

This report provides evidence of how the above were achieved and examines Simple Stuff Works equipment in collaboration with the end user and what could be improved in future design and sales. The evidence obtained suggests that four key pieces of equipment have a clinical effect on the posture and quality if life of the people intending to use them. This is a new concept for NTPE manufacturers as this empirical and ethically approved study is the first to be completed with an adult population in a residential/nursing home. Simple Stuff Works can state that the evidence from this pilot study, that their NTPE can have a clinical effect as found in the results instead of purporting to be so without the evidence.
The use of Goldsmiths measurement of body indices was not used in this study as this would be a different study to the above.

Recommendations

1. The researchers will seek to publish the findings of the report in a peer reviewed journal.
2. The researchers will submit abstracts to relevant conferences for dissemination of the findings.
3. The researchers will seek to publish other papers that explore the findings from the study.
4. To continue the collaboration with end users in the design/modification of simple stuff works equipment for adults.
5. Further research to explore the use of Goldsmiths measurement of body indices in a younger adult population.

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Appendices

1. Ethics approval letter

University of Salford MANCHESTER

Research, Innovation and Academic Engagement Ethical Approval Panel

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1 September 2017

Dear Melanie,

RE: ETHICS APPLICATION–HSR1617-169 - Evaluation of Night Time Therapeutic Positioning System for adults with complex postural problems.

Based on the information you provided, I am pleased to inform you that application HSR1617-169 has been approved.

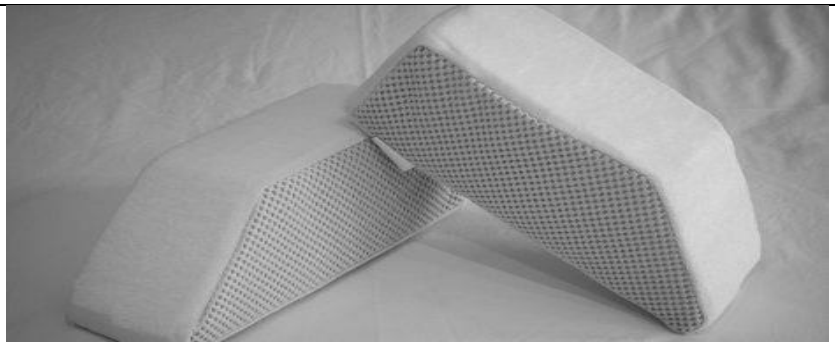
If there are any changes to the project and/or its methodology, then please inform the Panel as soon as possible by contacting Health-ResearchEthics@salford.ac.uk

Yours sincerely,

Stephen Pearson
Deputy Chair of the Research Ethics Panel

2. Equipment

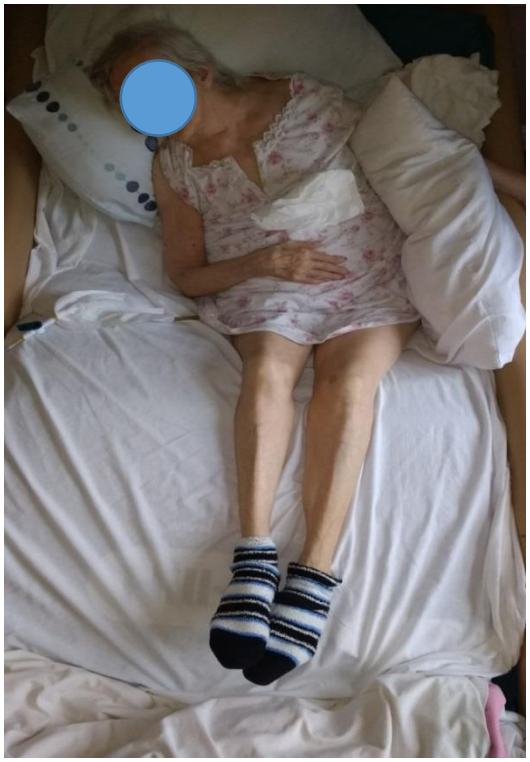
Name of Equipment	Picture
Foot supports	
Stabilising Mesh	
Soft fibre wedges	
Padded Lateral Supports	
Supine Stabiliser	

Side Lying Leg Support	
Neck Support Pillow	
Horseshoe pillow	
Sausage Pillow	
Fibre wedges	

Photographs (Before, equipment insitu and after)

Participant 1

Before



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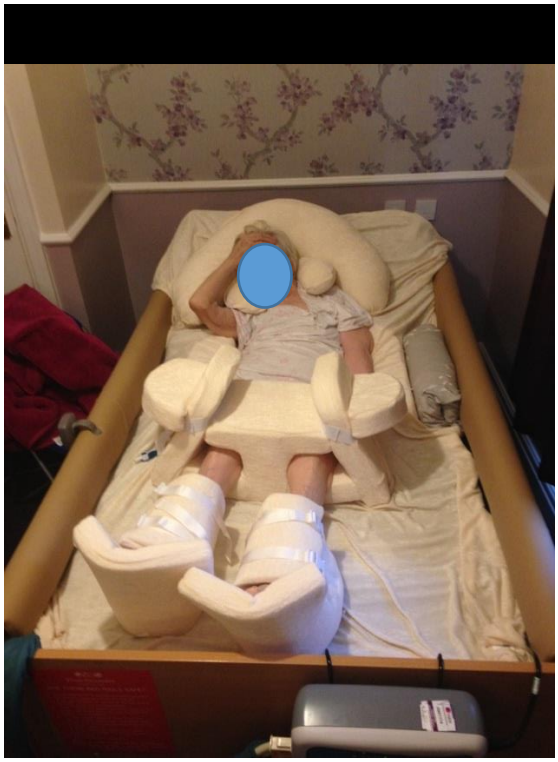
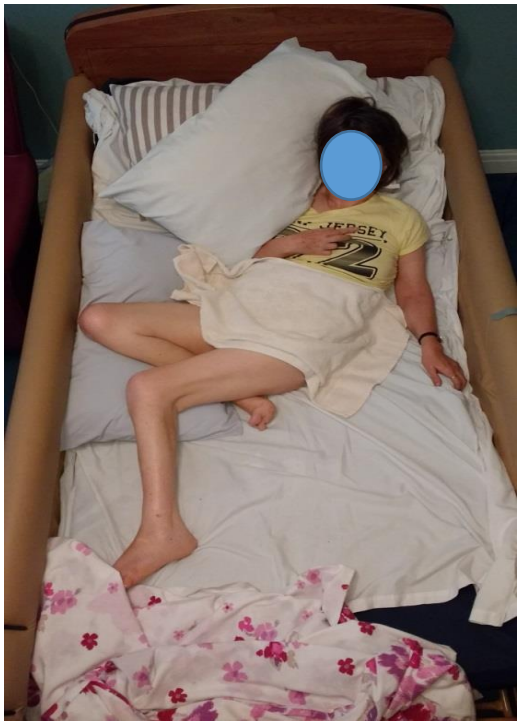
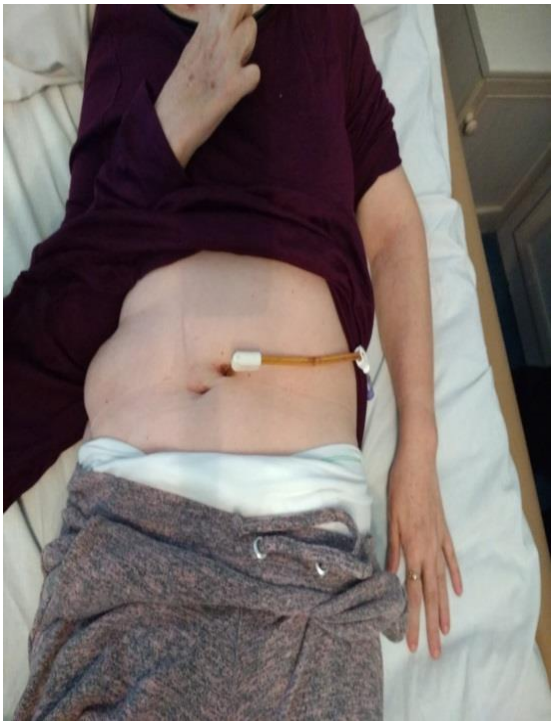


Participant 3

Before





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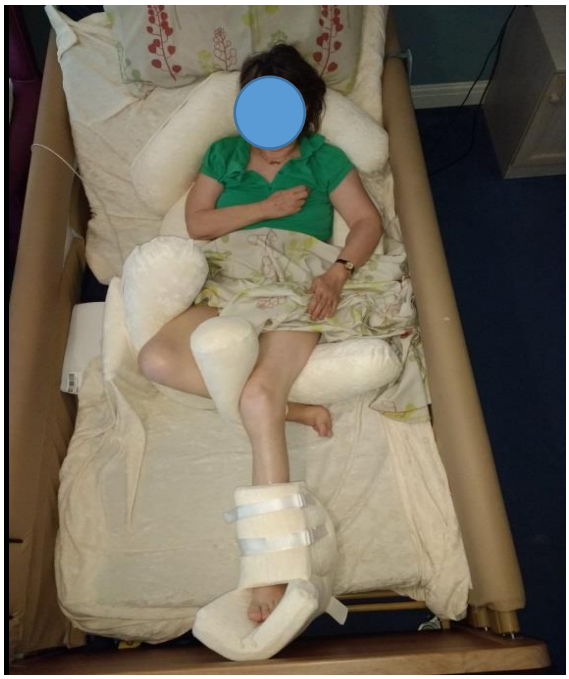

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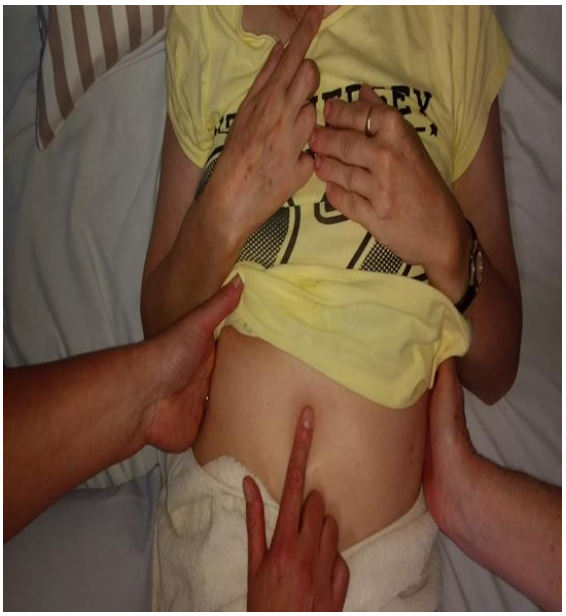

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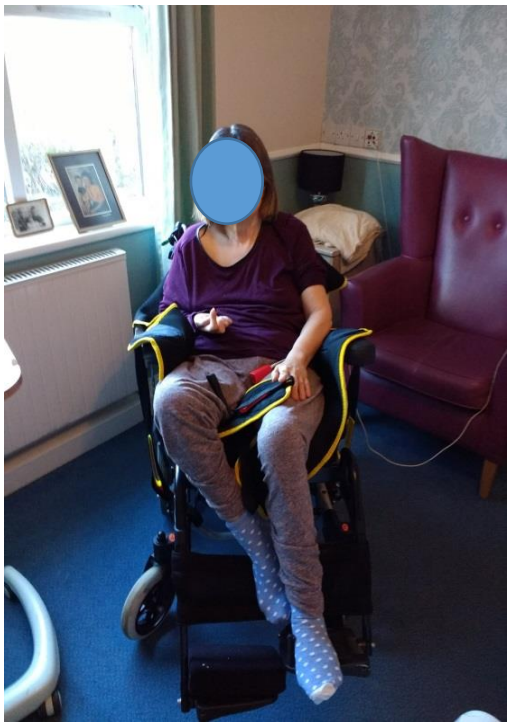
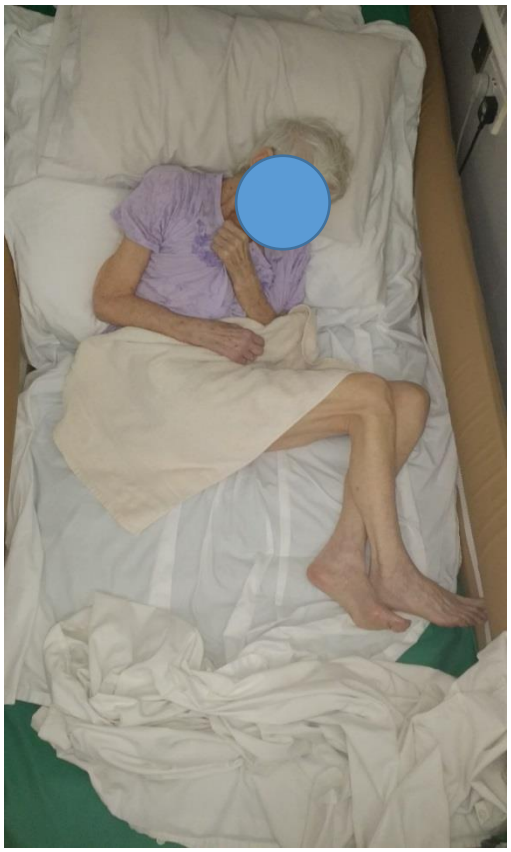
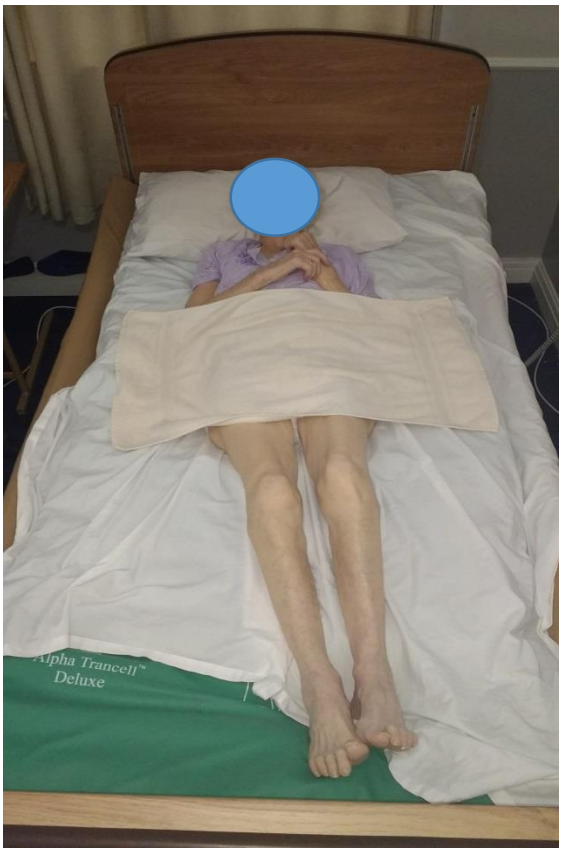


Participant 4

Before





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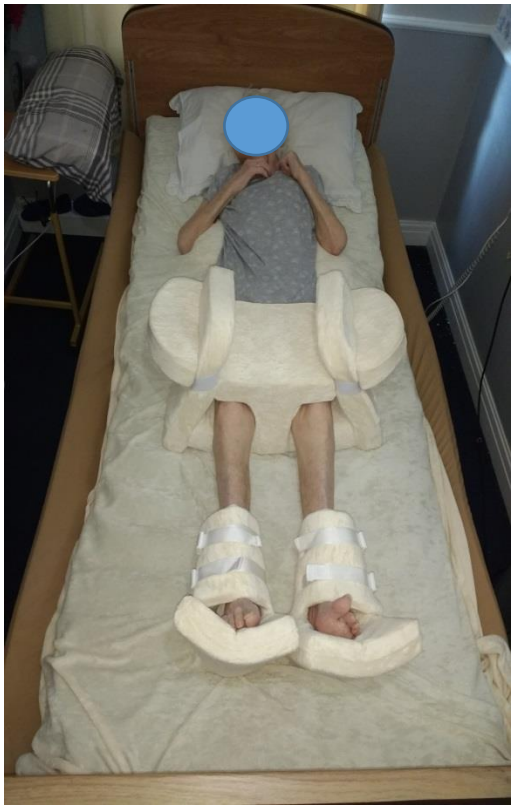
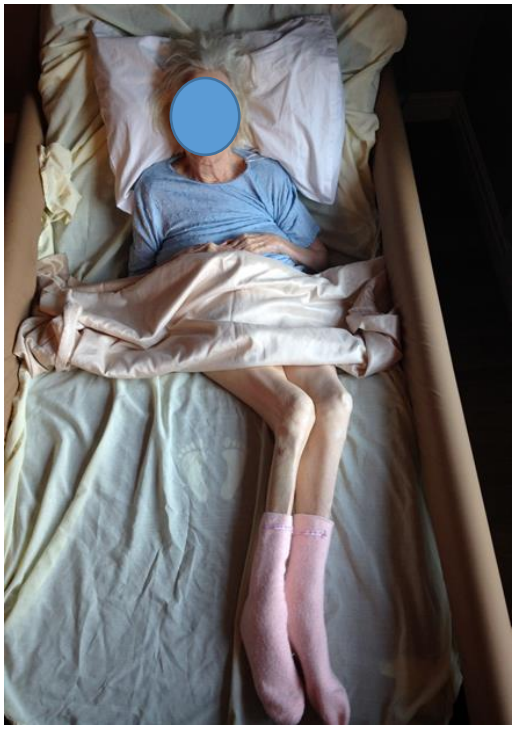


After

Participant 5

Before



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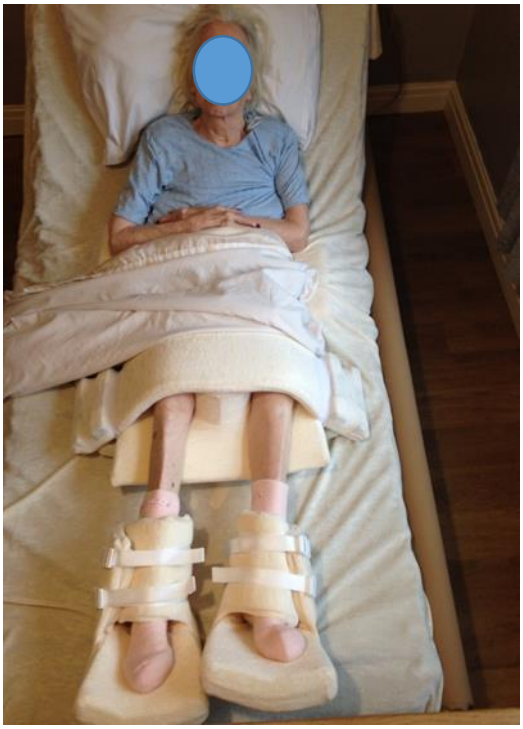

Participant 6

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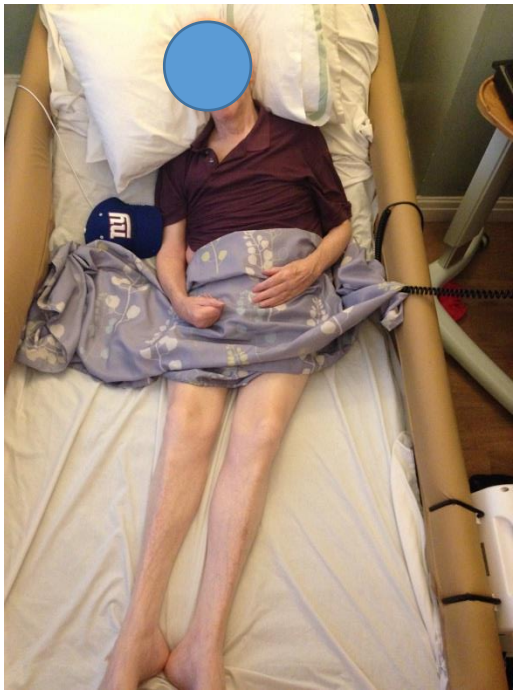

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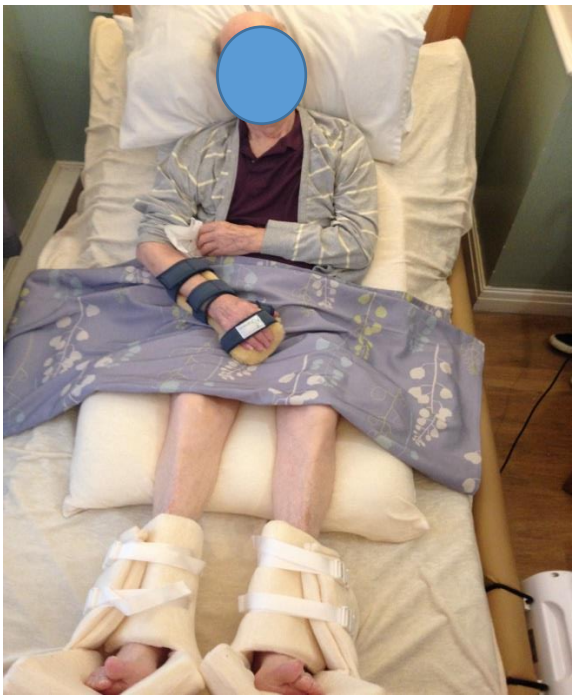

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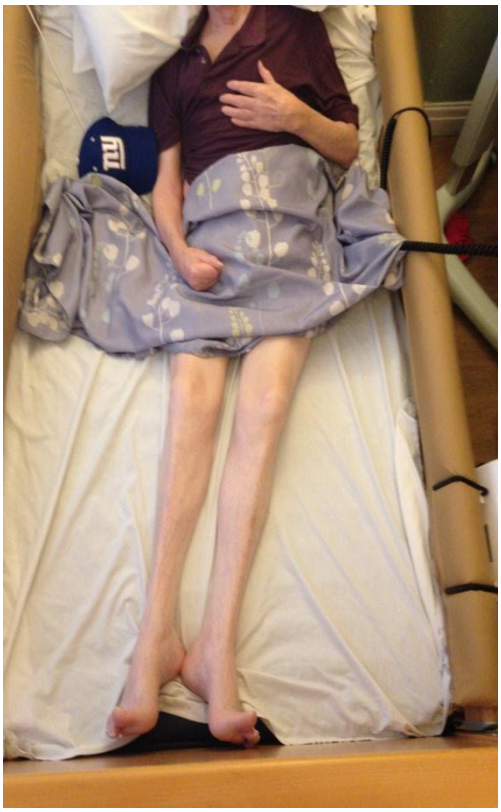

Participant 7

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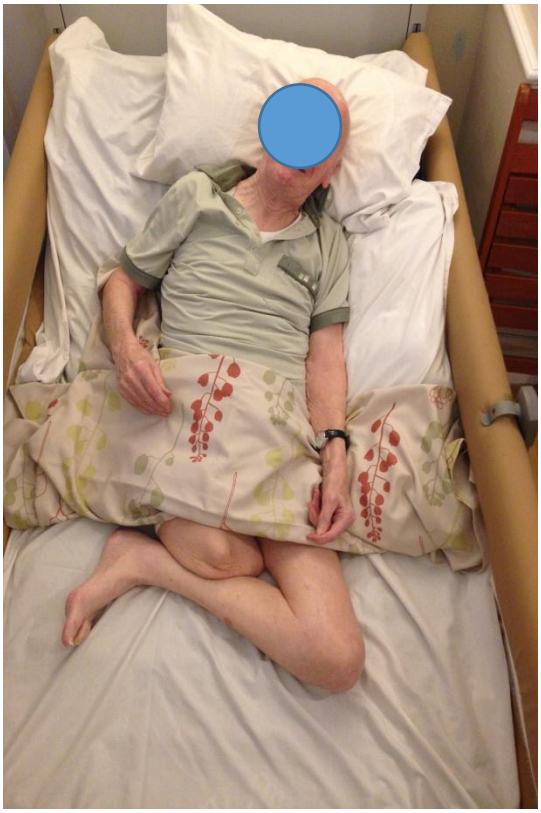

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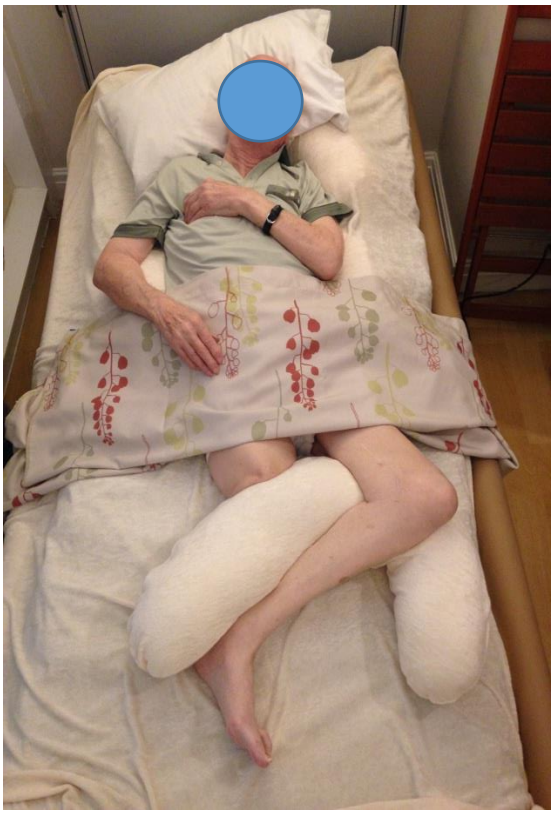

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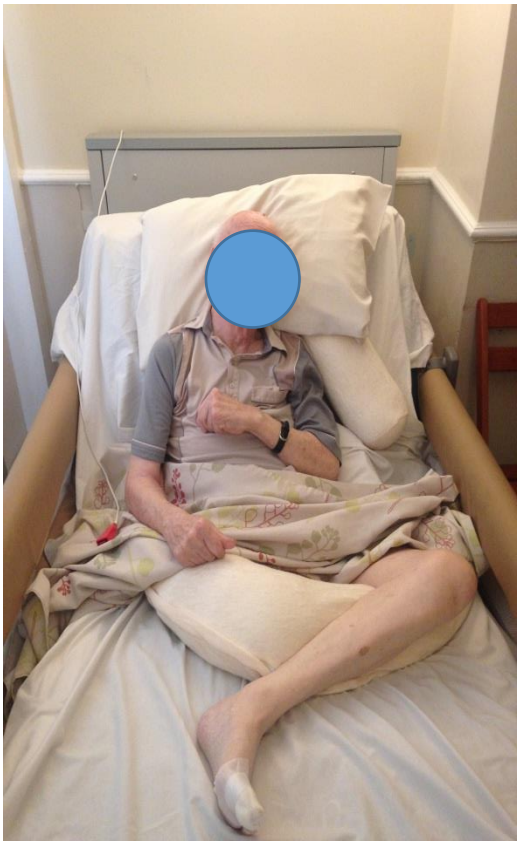

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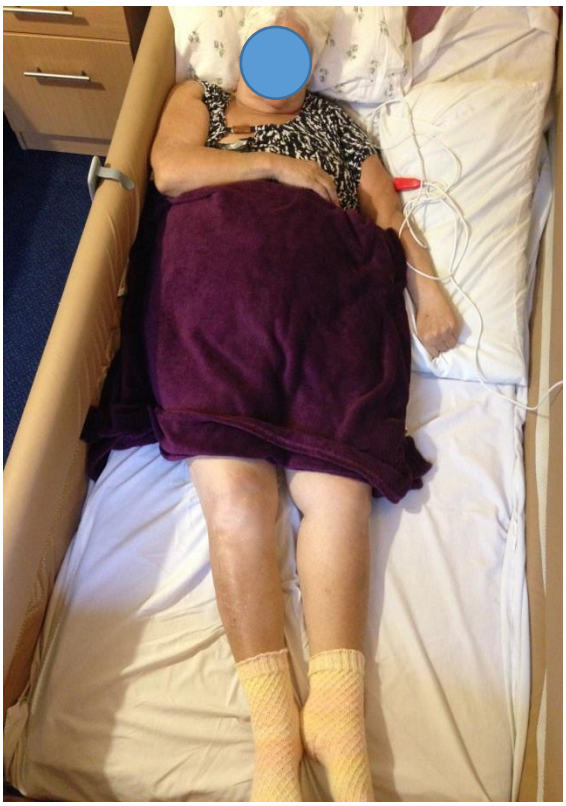

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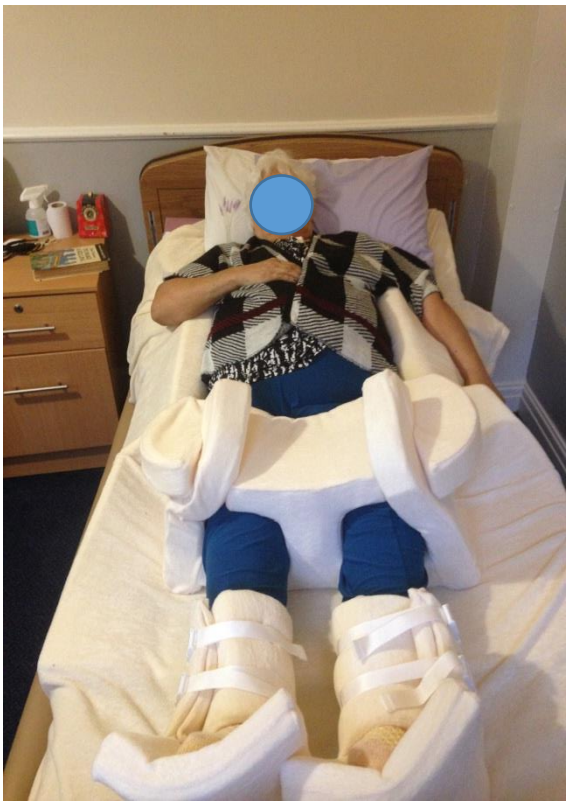

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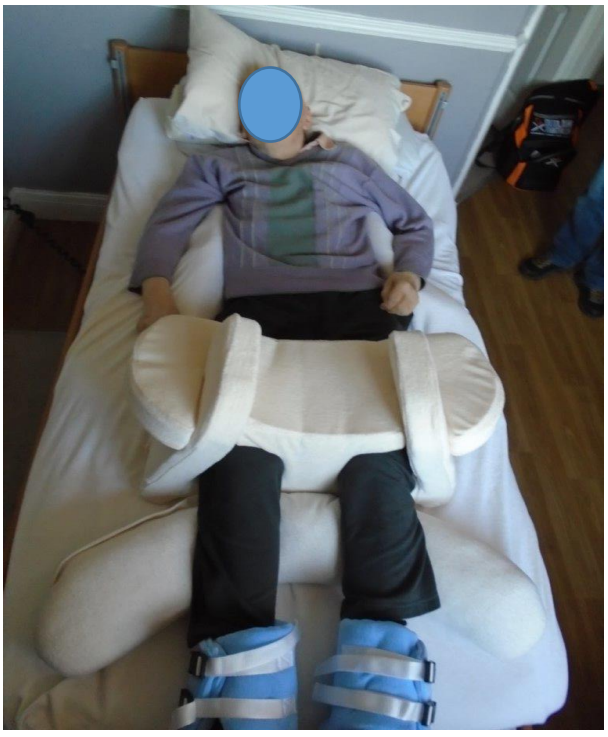

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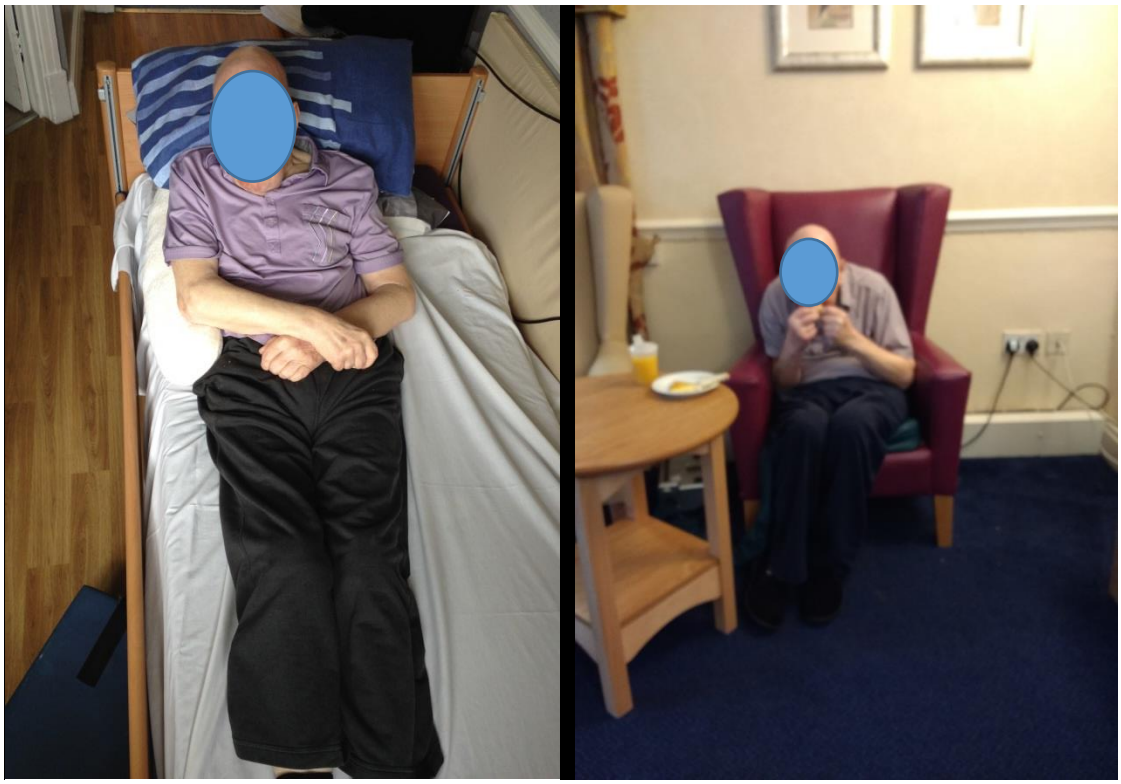

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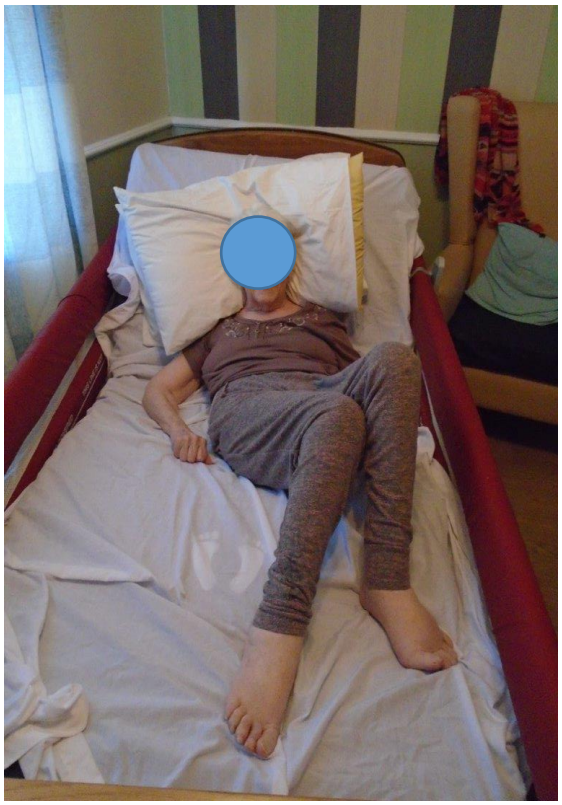

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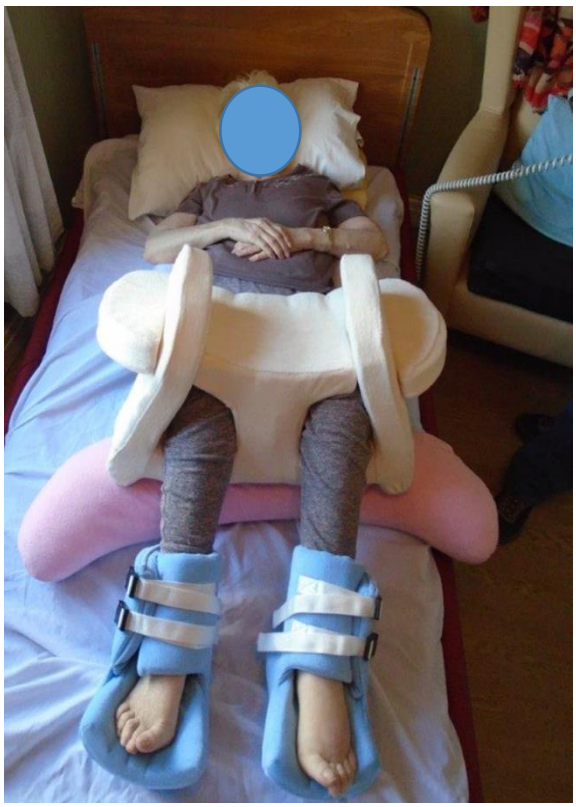

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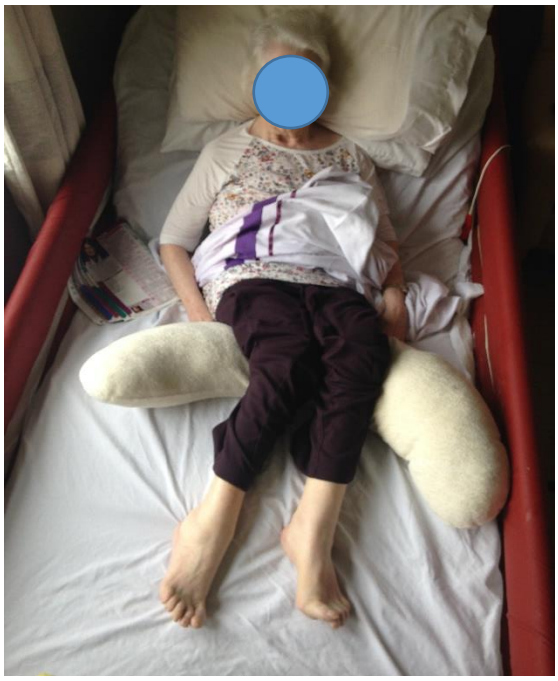
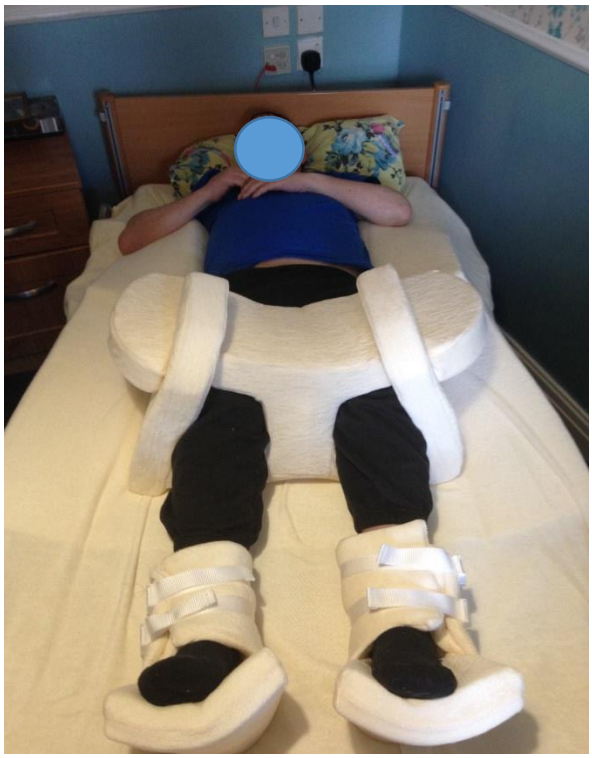
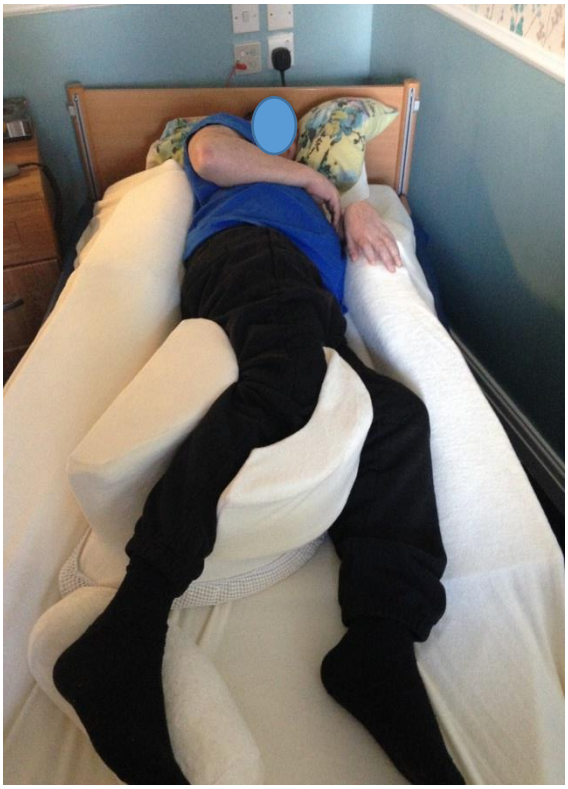


Particpant 12

Before

Equipment insitu





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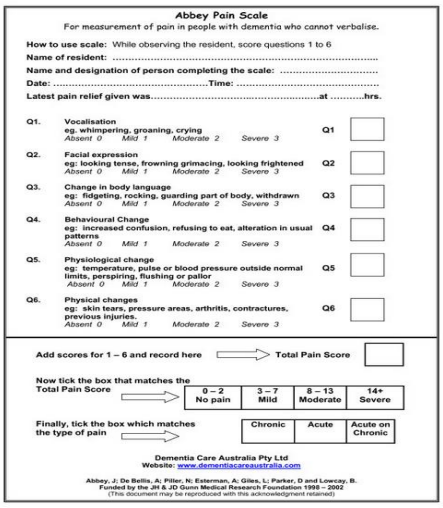
3. Data Collection Tools



Abbey Pain Scale

For measurement of pain in people with dementia who cannot verbalise.

How to use scale: While observing the resident, score questions 1 to 6

Name of resident: .....

Name and designation of person completing the scale: .....

Date: .....**Time:** .....

Latest pain relief given was.....**at** .....**hrs.**

Q1.	**Vocalisation** **eg. whimpering, groaning, crying**	Absent 0	Mild 1	Moderate 2	Severe 3	Q1
Q2.	**Facial expression** **eg: looking tense, frowning grimacing, looking frightened**	Absent 0	Mild 1	Moderate 2	Severe 3	Q2
Q3.	**Change in body language** **eg: fidgeting, rocking, guarding part of body, withdrawn**	Absent 0	Mild 1	Moderate 2	Severe 3	Q3
Q4.	**Behavioural Change** **eg: increased confusion, refusing to eat, alteration in usual patterns**	Absent 0	Mild 1	Moderate 2	Severe 3	Q4
Q5.	**Physiological change** **eg: temperature, pulse or blood pressure outside normal limits, perspiring, flushing or pallor**	Absent 0	Mild 1	Moderate 2	Severe 3	Q5
Q6.	**Physical changes** **eg: skin tears, pressure areas, arthritis, contractures, previous injuries.**	Absent 0	Mild 1	Moderate 2	Severe 3	Q6

Add scores for 1 – 6 and record here → **Total Pain Score**

Now tick the box that matches the Total Pain Score

0 – 2	3 – 7	8 – 13	14+
No pain	Mild	Moderate	Severe

Finally, tick the box which matches the type of pain

Chronic	Acute	Acute on Chronic

Dementia Care Australia Pty Ltd
Website: www.dementiacareaustralia.com

Abbey, J; De Bellis, A; Piller, N; Esterman, A; Giles, L; Parker, D and Lowcay, B.
Funded by the JH & JD Gunn Medical Research Foundation 1998 – 2002
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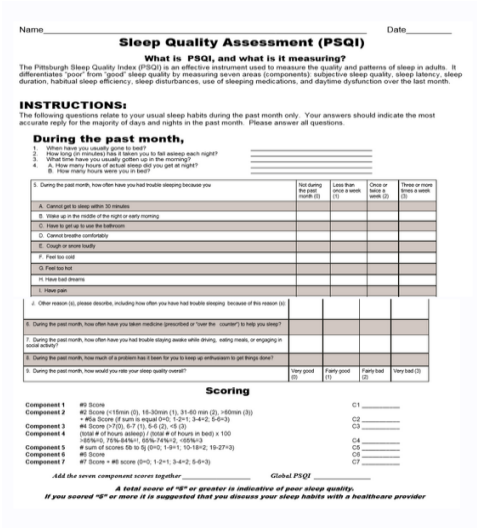

Name_____ Date_____

Sleep Quality Assessment (PSQI)

What is PSQI, and what is it measuring?

The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates "poor" from "good" sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month.

INSTRUCTIONS:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

During the past month,

1. When have you usually gone to bed? _____
2. How long (in minutes) has it taken you to fall asleep each night? _____
3. What time have you usually gotten up in the morning? _____
4. How many hours of actual sleep did you get at night? _____
   B. How many hours were you in bed? _____

5. During the past month, how often have you had trouble sleeping because you	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
A. Cannot get to sleep within 30 minutes				
B. Wake up in the middle of the night or early morning				
C. Have to get up to use the bathroom				
D. Cannot breathe comfortably				
E. Cough or snore loudly				
F. Feel too cold				
G. Feel too hot				
H. Have bad dreams				
I. Have pain				
J. Other reason (s), please describe, including how often you have had trouble sleeping because of this reason (s).				
6. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?				
9. During the past month, how would you rate your sleep quality overall?	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)

Scoring

Component 1	#9 Score	C1 _____
Component 2	#2 Score (<15min (0), 16-30min (1), 31-60 min (2), >60min (3)) + #5a Score (if sum is equal 0=0, 1-2=1, 3-4=2, 5-6=3)	C2 _____
Component 3	#4 Score (>7 (0), 6-7 (1), 5-6 (2), <5 (3)	C3 _____
Component 4	(total # of hours asleep) / (total # of hours in bed) x 100 >85%=0, 75%-84%=1, 65%-74%=2, <65%=3	C4 _____
Component 5	# sum of scores 5b to 5j (0=0, 1-9=1, 10-18=2, 19-27=3)	C5 _____
Component 6	#6 Score	C6 _____
Component 7	#7 Score + #8 score (0=0, 1-2=1, 3-4=2, 5-6=3)	C7 _____

Add the seven component scores together _____ *Global PSQI* _____

A total score of "5" or greater is indicative of poor sleep quality.
If you scored "5" or more it is suggested that you discuss your sleep habits with a healthcare provider

Appendix

University of Salford MANCHESTER

PHYSIOLOGICAL MEASUREMENTS, NUTRITIONAL AND FLUID INTAKE

AND SKIN ASSESSMENT

Week / Measure	Week 1	Week 12
Blood Pressure (BP)		
Pulse		
Resting Respiration		
Oxygen Saturation		
Fluid intake intake over last 24 hours		

Appendix

Intake of food over last 24 hours		
Skin assessment		

WATERLOW PRESSURE ULCER PREVENTION/TREATMENT POLICY

RING SCORES IN TABLE, ADD TOTAL. MORE THAN 1 SCORE/CATEGORY CAN BE USED

BUILD/WEIGHT FOR HEIGHT		SKIN TYPE VISUAL RISK AREAS		SEX AGE		MALNUTRITION SCREENING TOOL (MST) (Nutrition Vol.15, No.6 1999 – Australia
AVERAGE	0	HEALTHY	0	MALE	1	A - HAS PATIENT LOST WEIGHT RECENTLY: YES - GO TO B; NO - GO TO C; UNSURE - GO TO C
BMI = 20-24.9		TISSUE PAPER	1	FEMALE	2	B - WEIGHT LOSS SCORE: 0.5 - 5kg = 1; 5 - 10kg = 2; 10 - 15kg = 3; > 15kg = 4; unsure = 2
ABOVE AVERAGE		DRY	1	14 - 49	1	
BMI = 25-29.9	1	OEDEMATOUS	1	50 - 64	2	
OBESE		CLAMMY, PYREXIA	1	65 - 74	3	
BMI > 30	2	DISCOLOURED GRADE 1	2	75 - 80	4	
BELOW AVERAGE				81 +	5	C - PATIENT EATING POORLY OR LACK OF APPETITE: NO = 0; "YES" SCORE = 1
BMI < 20	3	BROKEN/SPOTS GRADE 2-4	3			NUTRITION SCORE: If > 2 refer for nutrition assessment / intervention
BMI=Wt(Kg)/Ht (m)²						

CONTINENCE		MOBILITY		SPECIAL RISKS			
COMPLETE/ CATHETERISED	0	FULLY	0	TISSUE MALNUTRITION		NEUROLOGICAL DEFICIT	
URINE INCONT.	1	RESTLESS/FIDGETY	1	TERMINAL CACHEXIA	8	DIABETES, MS, CVA	4-6
FAECAL INCONT.	2	APATHETIC	2	MULTIPLE ORGAN FAILURE	8	MOTOR/SENSORY	4-6
URINARY + FAECAL INCONTINENCE	3	RESTRICTED	3	SINGLE ORGAN FAILURE (RESP, RENAL, CARDIAC)	5	PARAPLEGIA (MAX OF 6)	4-6
		BEDBOUND e.g. TRACTION	4	PERIPHERIAL VASCULAR DISEASE	5	MAJOR SURGERY or TRAUMA	
		CHAIRBOUND e.g. WHEELCHAIR	5	ANAEMIA (Hb < 8)	2	ORTHOPAEDIC/SPINAL	5
SCORE				SMOKING	1	ON TABLE > 2 HR#	5
10+ AT RISK						ON TABLE > 6 HR#	8
15+ HIGH RISK				MEDICATION - CYTOTOXICS, LONG TERM/HIGH DOSE STEROIDS, ANTI-INFLAMMATORY - MAX OF 4			
20+ VERY HIGH RISK				# Scores can be discounted after 48 hours provided patient is recovering normally			

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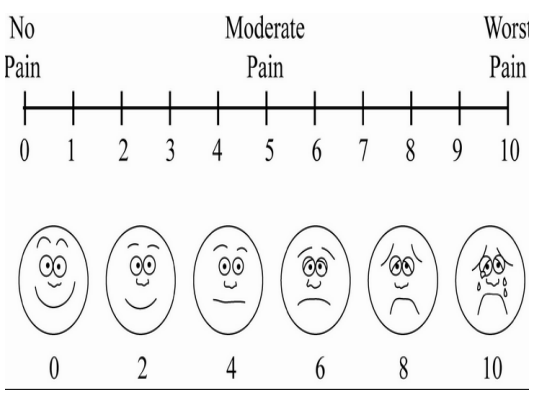
Obtainable from the Nook, Stoke Road, Henlade TAUNTON TA3 5LX
* The 2006 revision incorporates the research undertaken by Queensland Health.
www.judy-waterlow.co.uk



4. **Interview Guide Residents**

DRAFT INTERVIEW GUIDE RESIDENTS

(Refer to: Pain Scale, Body Symmetry, Sleep Diary, Observations)

Participant Number:

Pain Scale:

1. We have noticed from the chart that you have recorded a score of xxxx can you tell us more about that (making reference to the particular observations on the chart). What is it about the position that makes you score xxx in this category? Is it anything in particular about the equipment in relation to pain you can tell me about?
   Prompt about feelings of aches, stiffness, or soreness: Any specific areas? Generally? Can you describe it in as much detail as possible?

Body Symmetry

2. From the assessment chart of body shape we have noticed a difference/no difference in:
   - pelvis
   - knees
   - chest range of movement.

   Have you noticed a difference and what effect has this had on you?

Sleep Score

3. During the past month, how often have you had trouble sleeping because you (refer to sleep questionnaire for prompts)?

Observations

4. Your blood pressure readings changed between week 1 and week 12. Did you notice any change yourself in the way you felt?
5. Your pulse rate changed between week 1 and week 12. Did you notice any change yourself in the way you felt?
6. Your resting respiration readings changed between week 1 and week 12. Did you notice any change yourself in the way you felt?
7. Your oxygen saturation readings changed between week 1 and week 12. Did you notice any change yourself in the way you felt?
8. Skin inspection at week 1 changed at week 12. Did you feel any difference yourself? Do you know why?

9. Your nutrition and fluid intake changed between week 1 and week 12. Can you tell us more about that?

General questions

10. I feel poorly positioned: Can you explain why you have rated this high…..low? Is there a particular reason?

11. I feel like I have been in one position for too long: Why?

12. I feel like I need to move or shift my position: Why? How did your body react? Are there any other reasons?

13. I feel pressure in some part or parts of my body: can you specify the areas? Can you expand on this and think of why it is these areas?

14. I feel too hot or cold or damp: Any particular area? Why do you think this is so? What was that like for you?

15. I seek distraction to relieve discomfort: What did you do? Why did you do this particularly?

16. I feel uncomfortable: Why are you feeling uncomfortable? Any particular areas? What was that like for you? What were your feelings about that? How did your body react?

17. I feel comfortable: Why? Anywhere in particular? Can you think of any reasons for feeling comfortable? Can you describe it in as much detail as possible? Is it correct that….?

18. I feel good: can you tell me a bit more about why you feel good? Can you say something more about it?

19. I feel able to concentrate on my work or activities: Can you tell me what particular activities you are able to concentrate on? Why do you think this is so?

20. Tell us how you felt about the equipment in relation: *fabric, ease of use, colour, shape, size.*

21. Is there anything else you would like to add?

5. Focus Group Guide

DRAFT INTERVIEW GUIDE FOCUS GROUP

1. Please describe what attracted you to participating in this project.
2. Were there any practice constraints to attending the training?
3. Please describe whether you felt that the learning environment was conducive?
4. Which activities from the training did you feel were appropriate?...why…
5. Please describe how you have been able to apply this new learning into the workplace? Please give an example, ……or if not, could you describe the key reasons why you felt that this programme didn't support your practice.
6. Do you think this learning will benefit the patient experience? – please describe
7. What were the best things about the training?
8. What else could have been included in the training?
9. Please describe whether the training could have been strengthened?
10. Are there any other comments you would like to add about the training?
11. Tell us how you felt about the equipment in relation: *fabric, ease of use, colour, shape, size.*
12. Did you notice any difference in the residents who participated in the study? *Prompt if needed on pain score, sleep, body shape, activities of daily living, nutrition and fluid intake, physiological and general observations.*
13. Is there anything else you would like to add?