

Measuring the effectiveness of competency - based education and training programmes in changing the manual handling behaviour of healthcare staff

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Measuring the effectiveness of competency - based education and training programmes in changing the manual handling behaviour of healthcare staff

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This study aimed to measure the effectiveness of competency-based training, as recommended by the Royal College of Nursing, on the manual handling behaviour of health care staff. Sixteen health care organisations participated in the study representing both acute and primary care, and a wide geographical spread including England, Scotland and Wales. A question set was developed to measure the level of compliance with the RCN recommendations at each participating organisation. Four members of staff were recruited at each organisation and asked to perform three patient handling tasks: (1) sitting-to-standing transfer; (2) repositioning in sitting; and (3) lying-to-lying transfer. Data were recorded about the manual handling behaviour using video and audio tape recordings. Measurement tools included observational methods (postural analysis) and interview methods (concurrent verbal protocols and semi-structured interviews). Results showed that there was a wide variation in the level of compliance with the RCN recommendations and that, in general, a high level of compliance was found in organisations where staff had better problem-solving abilities, possibly due to higher levels of supervision and support in the workplace.

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The names of organisations and individuals are not revealed to preserve their anonymity.

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EXECUTIVE SUMMARY

This study was undertaken for the Health and Safety Executive to investigate the Royal College of Nursing (RCN) Manual Handling Training Guidance and Competencies. It was proposed that a high level of compliance would be found in organisations where the training and education had a measurable effect on staff manual handling behaviour.

The RCN guidance aims to provide definitive recommendations for standards in manual handling training, which are based on research evidence, in the context of a fully integrated risk management system. The recommendations are based on principles of change management and participatory ergonomics where the traditional concept of training has moved forward to encompass three aspects: education (for core competencies); supervision of daily practice; and facilitation of problem solving. There are 63 competencies listed at three levels for the Back Care Advisor (BCA), Ward Manager and individual Staff Member.

The study protocol collected data about policies, procedures, supervision and communication (organisational question set), working postures (observations) and decision-making (verbal protocol analysis and semi-structured interviews). Sixteen sites were recruited representing acute and primary care organisations in England, Scotland and Wales. The BCA at each site was sent an organisational question set and asked to provide evidence in support of all the answers. This document was scored and used to determine the level of compliance of the organisation. Three tasks were simulated (sitting-to-standing, repositioning-in-sitting and lying-to-lying transfer) and data were recorded about working postures and decision-making processes.

The results from the organisational question set found that the sixteen sites had an average score of 47% compliance (range 17% to 77%). The three tasks offered a number of decision-making options:

- Horizontal transfer (lying-to-lying) was performed using the same equipment and technique at all sites, with minor variations in the use of extensions straps.
- Vertical transfer (sitting-to-standing) offered two equipment/technique options. The research evidence and professional guidelines support the use of the handling belt* rather than the manual technique. The participants choosing the belt came from sites with a higher organisational score and lower postural risk score. This suggests that organisations with a higher level of compliance with the RCN competencies will have safer working practices for this task.
- Repositioning-in-sitting was the most complex task and offered four options (hoist, handling belt*, slide sheet and manual technique). The sites with the highest organisational score were again following professional guidelines more closely, and chose the hoist. However the research literature supports the use of the handling belt and this was found to produce the lowest postural risk score. It was concluded that professional guidelines are not always in line with research evidence.

The findings from this project suggest that training and education have influenced the decision-making of the nurses. Where a decision was presented (repositioning-in-sitting) the participants from the sites with a higher organisational score demonstrated a higher level of problem solving ability (verbal protocol analysis and semi-structured interviews) in contrast to the participants choosing the manual technique. The problem solving ability provides an indication that training and education is being transferred into working practice, with the staff using the information to guide their manual handling decisions.

In conclusion, the question set can be used to identify organisations which are likely to be following professional guidelines and have safe working practices (score >50%), whereas those with a score <40% will need further investigation.

The content of the programme at each site was reviewed and it was found that all the sites used a mixture of training approaches. Further research would be needed to evaluate the organisational question set score, programme content and effectiveness (musculoskeletal sickness absence and manual handling incident reports) in order to recommend a particular approach and programme content.

**For this analysis handling slings were grouped with handling belts*

1 INTRODUCTION

1.1 THE PROBLEM OF BACK PAIN AND INJURY

The Health and Safety Executive's (HSE) Guidance on MHO Regulations (1992) states that 25% of all accidents reported to the enforcing authorities are associated with manual handling, and in the health service that figure rises to 50%. According to the Health and Safety Commission (HSC), Health Services Advisory Committee's Guidance on Manual Handling of Loads in the Health Service (1992), 70% of those are associated with the handling of patients.

Concerns and knowledge about the problem of manual handling in nurses have been around for many years. The Robens Report (Stubbs et al, 1986) was commissioned by the Department of Health and Social Security, it outlined the problem of back pain in nurses and recommended an ergonomic approach as the best solution. Legislation was issued in 1993 following European Directive 90/269/EEC. The effects of this legislation and the resultant investment in the health service are largely unclear. The Royal College of Nursing carried out surveys in 1992, 1996, and 1999 (IES, 1996, 1999). The prevalence of reported back pain has changed very little over that time, and if anything has got worse. In 1992 one in four nurses reported having had time off work due to back pain, in 1996 that went up to 32% and in 1999 the unpublished figure is 30%.

1.2 RISK FACTORS

In considering risk factors many previous studies of back pain in nurses have found associations between back symptoms and poor posture (Engels et al, 1996) and also with lifting patients (Jensen 1990, Pheasant and Stubbs, 1992). However many studies also point to other factors. Estryn-Behar et al 1990, considered stress at work and mental health status among female hospital workers and found that one of the main contributory factors was insufficiency in internal training and discussion. Owen (1987) found an association with stress over load. An association has been described between work organisation and working relationships factors, and back pain and injury (Dehlin and Berg, 1977; Damkot et al, 1984).

Wickstrom (2000) found that reports of back disorders attributed to work are related not only to physical workloads, but also to adverse psychosocial factors at work, such as unfair treatment, especially the lack of appreciation and respect. He suggests that it seems more plausible that bad work place atmosphere contributes to reporting of musculoskeletal pain than the experience of musculoskeletal pain contributes to perceiving the workplace atmosphere as bad. The suggestion is that these psychosocial factors affect how staff feel about their work and their attitudes towards it.

1.3 ATTITUDES AND BEHAVIOURS OF STAFF

The attitudes of nurses are a significant influence and a function of the organisational values and culture. Owen (1987) carried out a study investigating nurses attitudes and found that only 13% of respondents when questioned about preventative measures for back pain referred to approaches external to themselves such as increasing staffing levels, decreasing work load, or increasing patient participation in the task. The majority mentioned their own body mechanics. This is significant as it shows that a back care intervention has got to overcome entrenched beliefs and attitudes, and until workers accept and are convinced of the reasons for a back care intervention they will not be receptive to it. The management approach taken will influence the success or otherwise of such a culture change.

1.4 SOLUTIONS TO THE PROBLEM

1.4.1 Training

Traditionally, a training approach has been used to control the problem of back pain, according to Graveling (1991) the training approach is an easy option for an employer. This state of affairs seems to continue despite a large body of evidence pointing to the fact that it is misguided, including the recent work looking at risk factors. Indeed the effects of the investment in the health service are largely unclear (Trevelyan and Buckle, 2000).

Stubbs (1983) said that training is ineffective, as if the work is intrinsically unsafe then no amount of training can correct the situation. Hignett (1999) states that it is important that staff receive training in the systems of work and work equipment, but there is almost no convincing evidence that any benefit is derived from any of the behaviourist approaches to modify movement patterns or in technique training. This is also supported by Dehlin et al, (1976). Chaffin et al (1986) carried out a study looking at workers postures and implemented a training programme. They found that they had little effect and concluded that little improvement could be realised by the training programme with out ergonomic changes.

Straker (1990) states that traditional approaches of training and selection have not been demonstrably effective in reducing the problem, also that there has been little demonstrated effect of an ergonomic approach. Richardson and Hignett (1994) concur and suggest that the job design approach to changing the behaviour of human beings diminishes the status of the worker. Straker considers that the reasons why ergonomic intervention run the risk of failure are organisational, for instance low compliance with imposed directives from an external expert or client/consultant communication problems. He advocates that workers should be taught how to assess and reduce risks and considers that manual handling training for staff is ineffectual.

A review of behavioural programmes to promote safe behaviour among front line staff was carried out by Fleming and Lardner (2002). They were unable to identify any publications which demonstrated the effectiveness of a behaviour modification intervention in promoting critical risk control behaviours or safety leadership behaviours. They summarised by saying that behavioural change is not brought about by changing the person, but by changing their environment.

This was confirmed by Hignett et al (2003) in an evidence based review that encompassed the impact of manual handling training interventions for health care staff. They found that there was strong evidence from 12 studies that training interventions have no impact on working practices or injury rates.

1.4.2 Role of Management

The role of management and the creation of an environment that will be receptive to a back care initiative is of fundamental importance if the efforts of a back injury prevention programme is to have any hope of success (Nakata, 1994). Aird (1988) stated that there must be upper management support and commitment, and found that management control systems had a greater effect on decreasing back injuries than an education programme. Bullock (1993) stresses the importance of the level of management commitment to an education programme, and says that without their positive attitude the enthusiasm of the workers is likely to be limited. Training programmes have been shown to be ineffective (Stubbs et al, 1983), and a broader approach to the management of hazardous situations has been suggested. Too great an emphasis on lifting techniques for handling patients has given a narrow focus to ergonomics education, and a new strategy is needed. Risk management is required by the regulations as part of an ergonomic approach. Bullock (1993) suggests a health promotion approach which involves a culture change and needs a shared vision, a positive culture, and a

sense of community. Many existing prejudices and narrow beliefs have to be overcome and implementation takes place through individual health promotion as well as through organisational and environmental modifications. Hignett (1999) found that the management structure for the input of an ergonomic approach needs to support the cross professional, organisation wide issues that need to be addressed in order to implement changes. The maintenance and enhancement of existing levels of health through the implementation of effective programmes, services, and policies seems to be the approach that is needed

The Health and Safety Executive suggest key elements in Successful Health and Safety Management (1991) which lay out explicitly the importance of a strong management lead in any health and safety issue. First of all a policy must be in place which contributes to business performance while meeting responsibilities to people and the environment in a way which fulfils the spirit and the letter of the law. The policy should aim to achieve the preservation and development of physical and human resources and reductions in financial losses and liabilities. Another key element is the organisation. Organisations should be structured and managed so that health and safety policies can be put into effective practise. This involves the creation of a positive culture which secures involvement and participation at all levels. Effective communication and good leadership are of paramount importance. The third key element requires good planning to produce a systematic approach which will help to minimise risk, decide priorities, and set objectives. A fourth key element is measurement against predetermined standards to identify where action is needed to improve performance. Then finally auditing and systematic performance reviews.

Since training is frequently the first or even only way in which some organisations try to tackle the problem of musculoskeletal injuries amongst nurses, the RCN's Manual Handling Training Guidance (RCN, 2003) seems to be a step in the right direction as it attempts to incorporate the role of management.

1.5 RCN TRAINING GUIDANCE

The RCN recommendations were published in Feb 2003 and aim to provide definitive guidance for standards in manual handling training within a framework of clinical governance. The recommendations are based on an extensive consultation programme and reflect the diverse opinions and working practices of a range of professionals by drawing on research-based evidence. It is not intended to be a prescriptive, didactic approach concerned with content, length and duration of training as many previous guides have been. This guidance must be placed in the context of a fully integrated risk management system that meets all legal requirements

The recommendations are based on principles of change management and participatory ergonomics, where the traditional concept of training has moved forward to encompass three aspects: education (for core competencies); supervision of daily practice; and facilitation of problem solving.

Sixty-three competencies are listed at three levels:

1. Strategic: Back Care Advisor (BCA)
2. Line Management: Ward Manager
3. Individual: Staff member

Although these competencies were developed using considerable national consultation they have not been tested with respect to their impact on the risk of musculoskeletal injury.

2 AIM

The aim of this project is to investigate whether an organisation with high compliance of policies and procedures with the RCN competencies has low postural risks and traceable changes in lifting and handling behaviour linked to the local education and training programmes.

2.1 OBJECTIVES

1. To benchmark education and training programmes against RCN competency standards to gain a measure of organisational safety with respect to manual handling.
2. To collect postural analysis data (objective and subjective) for three specified tasks using REBA, RPE and individual discomfort ratings.
3. To investigate nurses' perception of personal behavioural change with respect to training received.
4. To compare the level of compliance with RCN standards with the observed working postures and behaviours.
5. To produce a validated question set for possible use in health care manual handling inspections to measure the effectiveness of manual handling policies and training programmes.
6. To highlight areas of future study for the continuance of this research programme.

3 METHODOLOGY

The intellectual question for this project is entirely based on the RCN competencies (2003). Firstly the themes from the three levels of competency were identified and rationalised into six categories for the purpose of this project (appendix 1) by SH, CB and EC. Eight competencies were duplicated across the three hierarchical levels of the competencies and so were omitted.

The six resultant categories are:

1. Organisational strategy and policies
2. Communication
3. Physical behaviour
4. Supervision
5. Personal limitations
6. Education and training attendance

Three methodological approaches were used to investigate the above themes:

1. Assessment of the quality of organisational policies and procedures for manual handling management by benchmarking the programme content against the Royal College of Nursing Competencies for Manual Handling, using an organisational question set developed specifically for this purpose, to investigate themes 1, 2 and 6.
2. Measurement of observable (physical) behaviour to measure the residual level of physical risk for carers in specified tasks to investigate theme 3.
3. To find out if/why the nursing staff changed their lifting and handling behaviour in relation to training received by assessing nurses' decision-making using interview data to investigate themes 2, 4 and 5.

3.1 QUESTION SET TO MEASURE ORGANISATIONAL COMPLIANCE

A question set was developed in consultation with HSE Inspectors using the six themes from the RCN competencies. A maximum score of 30 included all the themes and attempted to measure the communication and supervision between the three different levels of staff identified in the competencies. The themes for the question set are shown in figure 1 and a copy of the question set, with the scoring system, is included as appendix 2.

Figure 1 Question set themes

- | |
|--|
| <ul style="list-style-type: none">• Date and type of last external and internal audits (service efficacy, equipment, local monitoring etc.)• Type of manual handling risk assessment system (organisation/generic, local etc.)• Storage of risk assessments (central, local, both)• Review of risk assessments – frequency and formality of process• Location of patient assessments• Management systems (cascade, supervision systems, communication)• Competency: communication and monitoring |
|--|

3.2 OBSERVATIONAL TECHNIQUES

Three tasks were used for data collection and analysis:

1. Sit-to-stand: vertical transfer from a sitting position in a chair in to standing position.
2. Repositioning in sitting: moving the patient from the front edge of the chair to the back of the chair.
3. Lying-to-lying: horizontal transfer from lying on a bed to lying on a trolley.

Task scenarios were developed to ensure that participants had to make decisions to complete each task about the technique and/or equipment to select. In preparation for data collection BCA was asked to:

- Book four nursing staff for 2 x 2 hour periods from a range of clinical areas who had received manual handling training within the last twelve months.
- To ensure that a normal range of equipment was available. Normal refers the equipment that is generally available in the work place at that individual organisation and about which training has been received.
- To act as the patient/model for all three tasks.

Observable behaviour was measured using postural analysis, as well as simple recording of actions such as time taken and equipment selected. The nurses' perception of their physical discomfort/stress was recorded for each posture using rated perceived exertion (Borg, 1985).

3.2.1 Rapid Entire Body Assessment (REBA)

There are many different postural analysis tools that have been used to evaluate pre and post intervention control strategies. REBA (Rapid Entire Body Assessment, Hignett and McAtamney, 2000) was developed specifically for use in the health care industry and has been widely used internationally and included in the draft USA Ergonomic Program Standard (OSHA, 2000).

REBA collects data about the body posture, forces used, type of movement or action, repetition to identify the exposure to risk factors associated with the development of musculoskeletal disorders. An action level is generated on a five-point scale of 0-4 (table 1) which reflects the magnitude and severity of exposure and therefore the priority upon which the control measures can be based. The method was designed to evaluate tasks where postures are dynamic, static or where gross changes in position occur. In particular REBA has been designed to:

- Provide a postural analysis system which is sensitive to musculoskeletal risks in a variety of occupational tasks.
- Divide the body into segments which are coded individually, but with reference to movement planes.
- Provide a scoring system for muscle activity caused by static, dynamic, rapid changing or unstable postures.
- Reflect that coupling is important in the handling of loads but may not always be via the hands.
- Give an action level with an indication of urgency.
- Require minimal equipment.

Table 1 REBA Action Levels

Action Level	REBA Score	Risk Level	Action (including further assessment)
0	1	Negligible	None necessary
1	2 - 3	Low	May be necessary
2	4 - 7	Medium	Necessary
3	8 - 10	High	Necessary soon
4	11 - 15	Very high	Necessary NOW

3.2.2 Rated Perceived Exertion (RPE)

RPE (Borg, 1985, Kilbom, 1990) provides a linear scale to reflect the curvi-linear relationship between the intensity of a physical stimuli and human perception of the intensity. The scale steps (6-20) are adjusted so that they relate to the heart rate divided by 10. The scale is presented to the participant with the endpoints (6 and 20) defined and they are asked to rate their activity. The scale was used to supplement the physical risk data provided by REBA.

3.3 INTERVIEW TECHNIQUES

Concurrent verbal protocols and semi-structured interviews were used to access decision-making processes by the nurses during the tasks to explore whether the nurses had changed their manual handling behaviour as a result of training.

Decision-making in nursing is seen as the operationalisation of nursing knowledge (Thompson, 1999), however it has been demonstrated that patient handling education which is predominantly based on technique training has no impact on working practices (Hignett et al, 2003). Additionally there is minimal research about factors affecting decision-making about patient handling by nurses and what conceptual framework they might be working within which frames their decisions (Cimermanic, 2003).

3.3.1 Concurrent Verbal Protocols

As there is no way of observing someone's mental behaviour directly it is not possible to test whether there is a correlation between what someone actually thinks and what they say they think. Suchman (1987) looked at the use of VPA from the perspective of human-computer interaction and offered two alternative views of human action in terms of (1) plans and (2) situated actions. The first suggests that the organisation and significance of human action is located in underlying plans, such that plans are prerequisite to, and prescribe, action at every level of detail. The second suggests that action is contingent on circumstances (situated) which cannot be anticipated in advance. For this study the former position was adopted, that plans will proscribe the action taken by the nurses in carrying out the tasks.

The Verbal Protocol Analysis (VPA) approach for this project was derived from the theory of Exploratory Sequential Data Analysis (ESDA, Sanderson and Fisher, 1997). This approach is defined as 'any empirical understanding seeking to analyse systems, environmental and/or behavioural data (usually recorded) in which the sequential integrity of events has been preserved'. For this study the sequential integrity is important so that the key decision points (and therefore the impact of training and education) can be identified. ESDA sets out a structured analytical process which has been discussed by Hignett (2001, 2004) for use in ergonomics projects.

A Grounded Theory approach to analysis was taken to try and understand the way the nurses' reality was socially constructed with respect to decision-making about patient handling tasks (Morse and Richards, 2002). The aim of this part of the analysis was to produce themes which could then be taken forward, in combination with other data sources, to produce a model of decision-making which relates to the provision of training and education.

3.3.2 Semi structured interviews

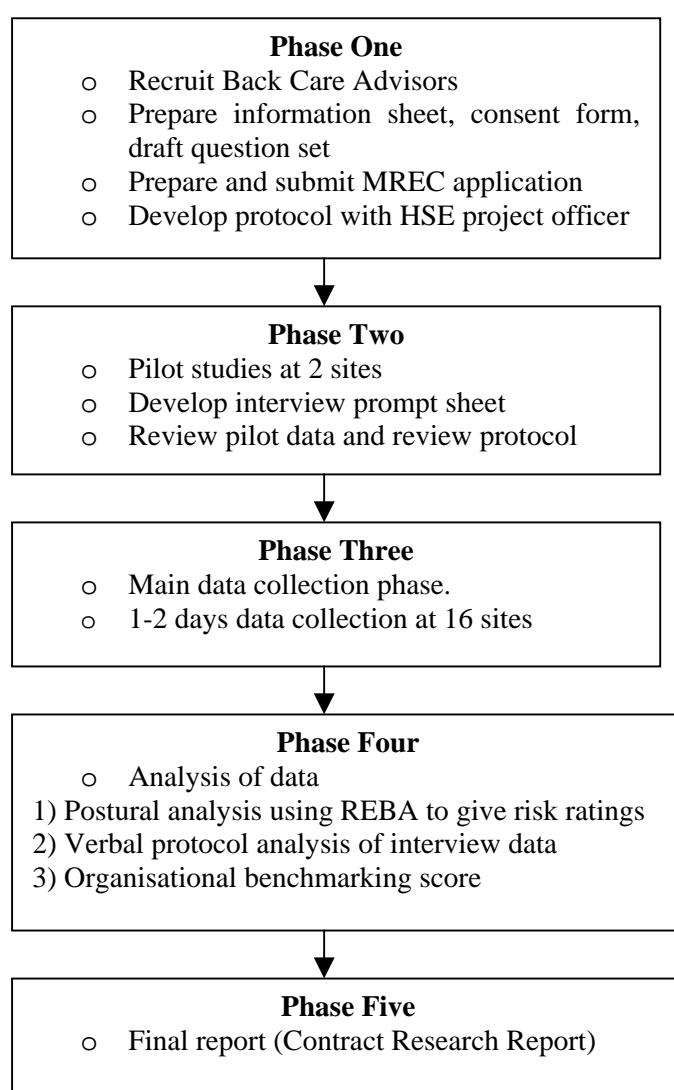
Semi-structured interviews were used after the observation and concurrent verbal protocol to delve further into issues surrounding the target research questions and to follow up any themes. The aim was to probe further into the participants' belief systems to try and understand the mechanisms, and circumstances, for the decisions made during these tasks.

Interviews are a valuable method in obtaining knowledge as talking to people to find out about their views and accounts is a legitimate way to generate data (knowledge) about research questions. Mason (1996) provides the underlying ontological position for this position, whereby taking peoples' interpretations and interactions as meaningful properties of their social reality, based on their knowledge and views, are sources of knowledge about the research questions.

4 METHOD

The project was carried out in five phases as shown in figure 2. The preparation of project (phase one) included the recruitment of the BCAs, ethical application and development of the detailed protocol and data collection tools. Phase two was used to pilot the protocol at 2 sites, minor changes were made to the data collection tools before the main data collection in phase three. The data were analysed in phase four for inclusion in the final report (phase five).

Figure 2 Flowchart to show stages of project



4.1 RECRUITMENT OF PARTICIPANTS

Approximately 60 BCAs were contacted. The mailing lists from the Post Graduate Certificate and Diploma courses in Back Care Management Loughborough University were used as it was assumed that they would be working to a high standard after attending the course. Personal contacts and local National Back Exchange (NBE) groups were also used.

The BCAs were initially sent a letter detailing the aims and background of the project. Once an initial positive response was received they were informed about the protocol for data collection and resource requirements. They were also sent the organisational question set and they were informed that the project had MREC ethical approval.

Sixteen sites agreed to participate on the basis of this information.

4.1.1 Data collection sites

The sixteen sites represented a wide range of trusts varying in size and service provision (mostly acute). The training approaches were found to be very different across the organisations. All the BCAs were asked to define the training approach(es) used, with the possibility of combination programmes. The results are in the table two:

Table 2 Training Approaches

<i>Training approach</i>	<i>Number of responses</i>
Ergonomic	11
Biomechanical	8
Other	6
Neuromuscular	5
Kinetic	3
Haptonomic	2
No Lifting	2
Manutension	1

Twelve responses were returned, with eight training methods listed and six respondents using only two approaches where as rest listed up to six approaches within their programmes. The category ‘Other’ included approaches such as risk assessment/management and safer handling/minimal handling as shown in table two. None of the organisations used just one approach, suggesting that BCAs are pragmatic rather than purist in their approach.

4.2 DEVELOPMENT OF PROTOCOL

A pilot study was carried out at two sites to test all parts of the data collection protocol. Minor modifications were made to the protocol as described in the following sections.

4.2.1 Organisational question set

The organisational question set was reviewed with the BCAs by attempting to compile all the necessary information. The wording of the question set was amended and foreseeable answers were scoped to ensure that all were allocated a score.

4.2.2 Physical behaviour and decision-making data collection

The protocol was tested with the four members of staff and potential problems were identified and addressed. A video recording of nurses carrying out the patient handling tasks was taken for postural analysis.

The room layout and collection protocol were finalised as shown in figure 3 and table 3.

Figure 3 Room layout for (a) repositioning-in-sitting and (b) lying-to-lying tasks



Table 3 Data collection timetable

<i>Time</i>	<i>Activity</i>
1½ hrs	Session with BCA going through checklist and obtaining evidence and information about the organisation. Set up
15 mins.	2 staff members to arrive – introduced and instructions given.
30 mins.	Practice task 1 (sit-to-stand) Perform task 1 plus video Perform task 1 plus audio tape and questions
30 mins	Practice task 2 (repositioning-in-sitting) Perform task 2 plus video Perform task 2 plus audio tape and questions.
15 mins	Second 2 members of staff arrive - introduction and instructions First 2 - rest/coffee
30 mins	Practice task 3 (lying-to-lying) Perform task 3 plus video Perform task 3 plus audio tape and questions
30 mins	First pair leave Second pair Practice task 1 Perform task 1 plus video Perform task 1 plus audio tape and questions
30 mins	Practice task 2 Perform task 2 plus video Perform task 2 plus audio tape and questions
30 mins.	Debrief with BCA, pack up

4.3 ETHICS

4.3.1 Multi-site Research Ethical Committee (MREC)

The work carried out for this project is covered by the MREC application (03/4/038, COREC). Any ethical clearance required for individual NHS Trusts was applied for locally under LREC. HSE survey approval was also granted. No other permissions or licenses were required.

Participants were guaranteed anonymity via a numerical referral system (e.g. Nurse 1, 2, 3 or 4, rather than by their given names). In the event of photo usage for inclusion in this dissertation or in the publication of any journal, participants were reassured that faces would be obscured to ensure confidentiality.

Participants were given time to ask questions of the researcher regarding any aspect of the project prior to agreement. They were also assured that should they prefer to withdraw from the study at any time, they were free to do so without any repercussion. After being provided with this information, participants were given similar consent forms as the Back Care Advisor (see appendix 3). All participants that arrived for participation in this study willingly signed both consent forms. No participants withdrew from the study.

4.3.2 Models (BCAs)

All BCAs participating as patients/models in the study were given an information sheet to read and two consent forms (participation and photographic usage). All BCAs willingly signed both consent forms and none withdrew from the study.

4.3.3 Participants (Nurses)

Upon arrival all participants were given the information sheet to read (appendix 3). The purpose of the project was then explained in particular with respect to the use of video-taping and audio-taping while completing the tasks to permit analysis and theory development about decision making patterns and postures assumed by nursing staff in the context of patient handling.

4.3.4 Pre-selection medical questionnaire

A Pre-Selection Medical Questionnaire (appendix 3) was given to both nursing staff and BCAs to ensure no contraindications existed that would prevent them from participating in the study. The researcher reviewed all medical questionnaires prior to starting the study. All participants were deemed medically suitable for participation in the study.

4.4 DATA COLLECTION

4.4.1 Question set

The first hour and a half was spent with the BCA going through the question set (table 3). The questions had been sent in advance so that the BCA had time to prepare and collect the evidence required. The researchers then viewed or collected the evidence as appropriate and recorded the answers on the form. Where no evidence was provided no score was given. BCAs were given the opportunity to send on further evidence following the session and scores were amended as extra information was received.

4.4.2 Physical behaviour (observable data)

Nurses 1 and 2 arrived first at all sites and were taken through the informed consent process and then asked to perform tasks 1 and 2. Nurses 3 and 4 then arrived were consented and all four were available for task 3. Nurses 3 and 4 were then asked to perform tasks 1 and 2. Each task was performed a total of 3 times.

- 1 Participants were presented with the scenario and given time to discuss and plan then practice.
- 2 The task was performed and video taped.
- 3 Participants were asked to talk their thoughts aloud and audio taped. They were then asked questions in a semi-structured interview which was audio-taped and finally they completed a RPE scale.

Postures were selected for analysis on a time-driven basis every 10 seconds for the first two tasks, repositioning-in-sitting and sitting-to-standing, and an average score was taken for the whole task. The lying-to-lying task was analysed on an event-driven basis with photographic stills taken at the point of taking the patient weight for pushing and pulling as the four nurses participating frequently changed positions during the task. There were 5 tasks completed per site.

In order to complete the tasks according to the protocol the following equipment had to be made available:

- One armchair typically used by patients in a real-ward setting
- A bed
- A second bed or trolley
- Patient handling equipment typically supplied at each individual hospital (varied).

Minimal information about the tasks (table 4) was given to BCAs in advance so that they could not brief their participants.

In order to support the scenarios, the researcher provided props which acted as a visual reminder for the model and nursing staff during each task. For example, in task one, where the scenario dictated that the patient had bilateral Colles fractures and could not use her arms, socks were worn on the model's lower arms to represent bilateral splints. In task two, where the patient had poor sitting balance and was post-pneumonia, the model held a sputum pot and a tissue with both hands. In task 3 where the patient was unconscious the model was blindfolded.

The participants were completely aware of the presence of the researcher. It is expected that the presence of an observer did have some impact on the actions, behaviours and verbal protocols provided by the nursing staff during the completion of the tasks. In order to minimize observer effects as much as possible the following actions were taken:

- The task performance was NOT being evaluated. Participants were informed there were no right or wrong ways of completing the tasks.
- Individuals were NOT being evaluated. Participants were part of a larger sample of nursing staff from across the UK.
- Practice. Participants were given a practice trial for each task without being video taped or audio taped to make them more familiar with the procedure.

Table 4 Description of the three patient transfer tasks

<i>Purpose</i>	<i>Task Completed</i>	<i>Patient Position</i>	<i>Patient Profile</i>
<i>Task 1: Sitting-to-Standing Transfer</i>			
To change patients trousers.	When patient is standing independently.	<ul style="list-style-type: none"> • Sitting in armchair with bottom at back of chair. • Arms in splints resting on a pillow. • Legs straight out front. 	<ul style="list-style-type: none"> • Age 83. • Bilateral colles fractures – cannot use arms at all. • Able to weight bear. • Has good sitting balance. • Frail and needs 2 people to transfer.
<i>Task 2: Repositioning-in-Sitting</i>			
To place patients bottom back in the chair for comfort.	When patient is sitting back in chair.	<ul style="list-style-type: none"> • Sitting in armchair with bottom 20cm from the back of the chair. • Holding a tissue and a sputum pot in hands. • Shoes off. • Legs straight out in front. 	<ul style="list-style-type: none"> • Age 87. • Very weak, post pneumonia. • Unable to weight bear. • Has adequate (for sitting in this chair) but poor sitting balance. • Fairly dependent – needs 2 people for all care. • Cannot lift own bottom from chair. • Some mobility in legs, but needs help to move them.
<i>Task 3: Lying-Lying Transfer</i>			
To transfer an unconscious theatre patient	When patient is safely on a trolley or second bed.	<ul style="list-style-type: none"> • Lying supine on a bed • 1 pillow 	<ul style="list-style-type: none"> • Age 45 • Unconscious • No head or spinal injuries

4.4.3 Interview data

Concurrent verbal protocols

The VPA data were collected during the third iteration of each trial where the participants were asked to ‘talk aloud’ and attempt to verbalise any thoughts they were thinking while they were performing the patient handling task. Where appropriate prompts were used (table 5) to encourage the participants to continue verbalising their thoughts. The analysis used a subsection of data from five sites; four NHS Trusts and one private rehabilitation hospital. A total of 20 nurses (18 women and 2 men) with a range of experience from 5 months to 23 years from 9 clinical specialities participated. The sites were selected as they represented a cross-section of scores from the organisational question set, ranging from lowest to highest.

Table 5 Verbal protocol prompts

Topic	Prompts
Equipment	Why chosen? Issues with patient, environment, task requirements, yourselves? Anything else that you considered – Why didn’t you do it? Did you position or alter the equipment in any special way – Why? How do you know/source for information given?
Technique	Why chosen? Issues with patient, environment, task requirements, yourselves? Anything else that you considered – Why didn’t you do it? How do you know / source for information given?
Training	How has your training developed how you do this task?
Communication	What instructions did you give each other and why? What instructions did you give the patient and why?
Terminology	‘Safe working height’ – What is this – How do you know? ‘Skate board stance’ – What is this – Why do you use it – How do you know?

Semi-structured interviews

The BCAs were asked to leave the room during the interviews to encourage the participants to speak and answer questions freely. This aimed to minimize participants altering their responses according to what they perceived the BCA wanted them to say and to allow them to express any issues they felt uncomfortable mentioning in the presence of the BCA.

Questions were developed in an attempt to focus on key decision points relating to the following categories: the nurses themselves, co-workers, equipment, patients, patient handling, the work environment and training. The researcher aimed to probe further into the participants’ belief systems, with the mission to understand what decisions they make and what circumstances surround the key decisions.

Typically the interviewing process commenced with the same question, which was “Can you explain what equipment/technique you chose?” The remainder of the interview flowed according to how the participants formulated their responses. Thus, although a portion of the target questions was pre-determined (table 5), the same themes were questioned, however, often using different wording, and in a different order. Depending on the answers generated in the interviews, the researcher attempted to follow the participants’ lines of thought, while eventually returning to each theme. In an effort to promote fluid and natural responses, and

preserve the participants' thought processes, the participants were rarely interrupted when they were speaking.

Table 6 Target Questions

Question	
1.	What factors determine the type of lifting equipment you will use?
2.	What other factors do you consider when you observe that a patient needs to be transferred, or moved from one spot to another?
3.	Have you been trained to use this technique?
4.	Do you feel safe using this technique? (a) if yes, what makes you feel safe about using this technique? (b) if no, what makes you feel unsafe about using this technique?
5.	Are you comfortable with using this technique? (a) if yes, what makes you feel comfortable about using this technique? (b) if no, what makes you feel uncomfortable about using this technique? (c) is there anything that would not make you comfortable using this technique, if so please explain?
6.	Are there any situations where you would want to use this technique but would be unable to do so?
7.	What sort of situations would make you unable to use this technique even if you wanted to?
8.	If you knew you were unable to perform a lift/transfer safely what would you do? (a) do you have an example of such a situation? (b) what was the end result of the situation? (c) reflecting back on the situation, is there anything you would have done differently? Please explain. (d) why do you feel it would have been better to do it this way instead of the way you did?

5 RESULTS AND ANALYSIS

The results are presented in sections, firstly the question set, then observational data, followed by the interview data (concurrent verbal protocol and semi-structured interview).

5.1 QUESTION SET FINDINGS

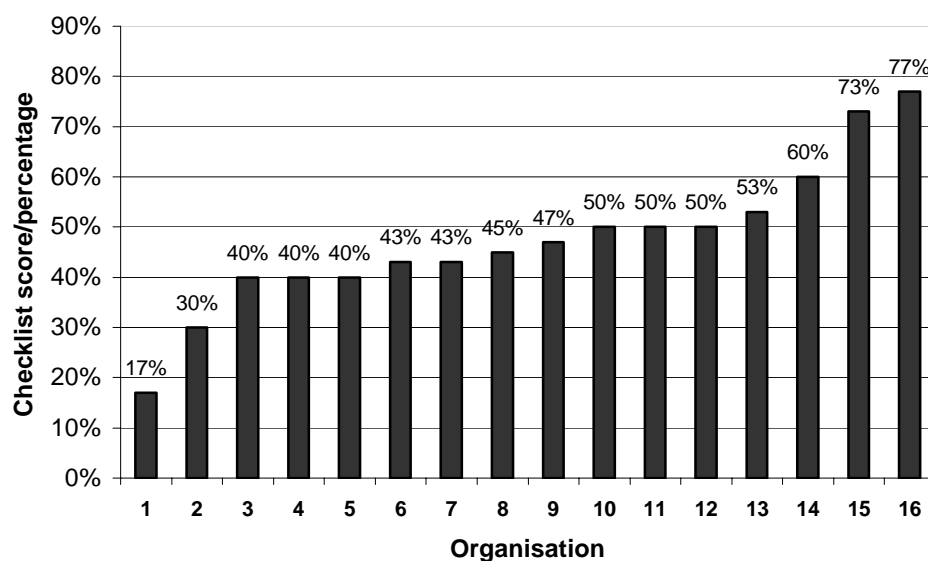
The information collected at the sites and the answers given by the BCAs were used to score the organisational question sets, with each site receiving a score out of 30.

The scores ranged from 17–77% compliance with the RCN competencies (figure 4). The majority of sites fell between 40 and 60%, with an average of 47%. Two organisations scored above 60% and two below 40%. This seems to show that only a few organisations showed excellence in compliance with the competencies and conversely only a few demonstrated non-compliance.

The question set was designed with the first twelve (40%) points allocated for policies, documentation (such as risk assessments, patient mobility assessments) and appropriate staff. Some of these are legal requirements and some are best practice. The results indicate that most organisations had a minimal level of on paper compliance. However it has been shown in the literature (chapter one) that the important aspects of organisational compliance are the role of management and amount of supervision between the different levels of staff. The remaining questions focused on organisational culture with 18 points allocated for the different types of communication. The assumption was made that if communication was evident then the supervision was taking place.

The organisations scoring above 40% had a process for communication/supervision in place, usually between the BCA and the manual handling supervisors. The higher scores seem to show the very few organisations that had clear lines of communication between the supervisors and the staff as well as the BCA.

Figure 4 Question set scores (percentage)



5.2 OBSERVATIONAL DATA FINDINGS

5.2.1 Inter-rater reliability

A panel of experts were invited to cross-check the coding of the REBA data and to review inter-rater reliability. Ten photographs were selected for this process and sent to the panel. Many of the photographs sent for analysis were complex due to difficulty seeing body parts (figure 5). Analysis criteria were given to assist with missing data which would be available at the point of collection.

Figure 5 Inter-rater reliability (a) knees on bed, (b) one leg off floor



The scoring for the 10 photographs resulted in a maximum of one point difference for each body part and inter-rater reliability was deemed to be satisfactory for the purposes of this study.

5.2.2 Physical behaviour (observational data)

The observational data collected for each pair of nurses at each data collection site included:

- Technique/equipment selected
- REBA score
- Time taken
- Borg score

These findings are presented by task with a graph to summarise the data for each of the three tasks.

5.2.3 Sit-to-Stand Transfer

This task involved standing the patient up from a sitting position in order to adjust clothing. Two different techniques were selected by participants to perform this task, a handling belt*¹ and a manual technique (figure 6). A very brief descriptive outline of the tasks sets out the basic steps as follows:

- | Belt | Manual |
|--|---|
| <ul style="list-style-type: none">• Insert belt with patient leaning forwards• Carers stand facing the patient• Carers bend their knees and grasp the belt handles• Carers step back and stand the patient up | <ul style="list-style-type: none">• Shuffle the patient to the edge of the chair• Carers stand facing the same way as the patient• Carers bend their knees and support/grasp the patient's back at a convenient place• Front hand supports the patient's forearm or rests on the sternum• Carers stand the patient up while transferring their weight from back to front foot |

¹ *For this analysis handling slings were grouped with handling belts

Figure 6 Sit-to-stand using (a) belt and (b) manual techniques

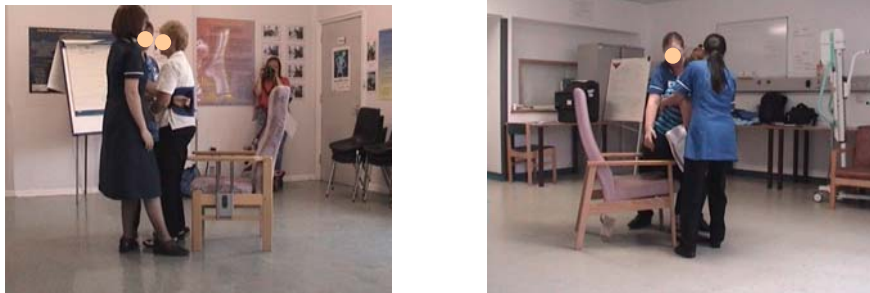
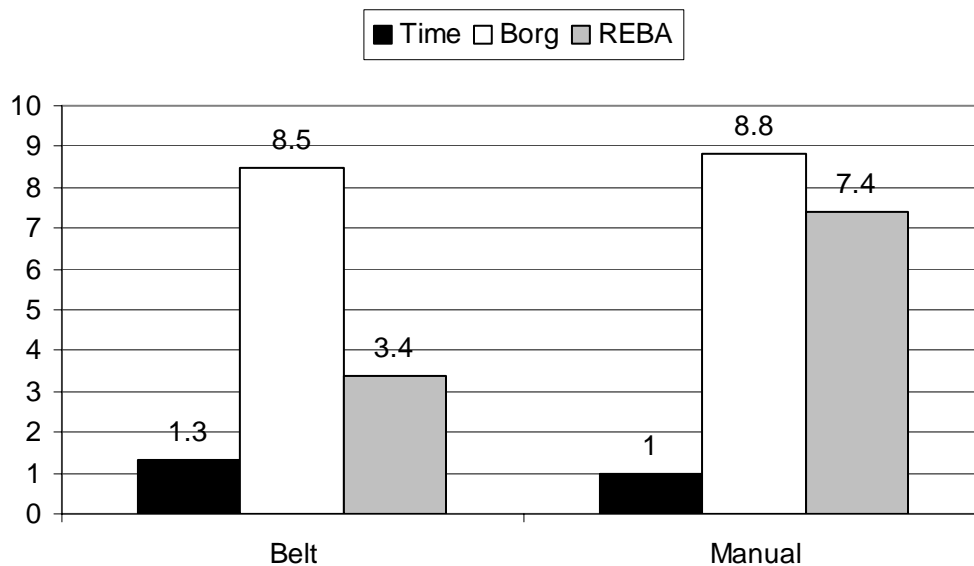


Figure 7 Observational data for sit-to-stand transfer



The summary table for the sit-to-stand transfer are shown in figure 7 and table 7, with the within-measure ranking indicated.

Table 7 Summary data for sit-to-stand transfer

<i>Equipment/ technique selected</i>	<i>No. of Participants</i>	<i>Ave. REBA Score</i>	<i>Time Taken (mins.)</i>	<i>Ave. Borg Score</i>	<i>Average Org. Score (%)</i>
<i>Belt</i>	32 (1)	3.4 (1)	1.3 (2)	8.5 (1)	51 (1)
<i>Manual</i>	24 (2)	7.4 (2)	1 (1)	8.8 (2)	39 (2)

Twenty-four participants selected the manual technique, they came from organisations with a below average organisational score of 39%. The average time taken to perform the task in this way was the quickest at an average of 56 seconds, 20 seconds faster than using a belt. The REBA score was the highest at 7.4, indicating a high risk and that action is necessary soon. The Borg scale gave an average score of 8.8, also the highest.

The belt was the most popular technique with thirty-two participants choosing to use it with an average organisational score of 51%. The average time taken to perform the manoeuvre in this way was slightly slower than the manual technique, at 77 seconds. The REBA score was the lowest at 3.4, indicating a low-medium risk level and that action is necessary/maybe necessary. The Borg scale gave an average score of 8.5 which was slightly lower than the manual technique.

5.2.4 Repositioning in sitting

This task required the nurses to reposition the patient from the front edge of the chair to a more secure location towards the back of the chair. An example of this task is given in BackCare (1999) using a slide sheet as follows with two carers:

1. Roll the slide sheet in half.
2. Encourage the person to shuffle or lean from side-to-side while inserting the slide sheet under the buttocks from either side, ensuring it is positioned correctly with open sides to the sides of the chair. The majority of the slide sheet should be behind the person on the seat.
3. Once in place ask the person to lean forwards and either encourage them to push themselves backwards or as long as they do not have painful knees or hips, apply gentle pressure through thighs/knees to the back of the chair.
4. If a third person is present then two carers can pull on the sides of the slide sheet from either side. While pulling both carers must adopt a walk stand position and use body weight to assist. Take care to slide, not lift.
5. A carer must stay kneeling in front of the person until the sliding device is removed.
6. Never lean over a high-backed chair to pull a person back in a chair.
7. To remove the sliding device, pull on the underneath layer of material and draw out from under the person towards the back of the chair.

This just gives one example of how to carry out this task with one equipment choice. Different manufacturers, professional bodies, regional expert groups and local advisors give instructions how to carry out tasks using different techniques and products. These instructions may vary but should always be based on the current research evidence and professional guidance (Lloyd et al, 1998).

Four different methods were selected and used by participants for this task (figure 8):

- Slide sheet
- Handling belt
- Hoist
- Manual technique

Figure 8 Repositioning-in-sitting using (a) slide sheet (b) belt (c) hoist (d) manual





The summary results for observational data are shown in figure 9 and in table 8 (including the organisational scores).

Figure 9 Observational data for repositioning in sitting

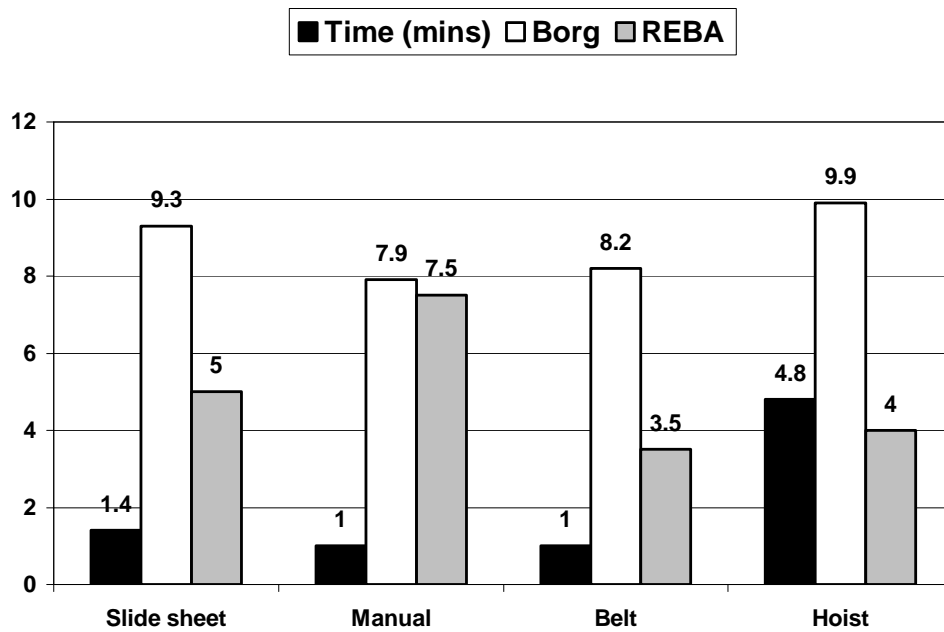


Table 8 Summary data for repositioning in sitting

<i>Equipment/ technique selected</i>	<i>Number of Participants</i>	<i>Ave. REBA Score</i>	<i>Ave. Time Taken</i>	<i>Ave. Org. Score (%)</i>	<i>Ave. Borg Score</i>
<i>Belt</i>	6 (4)	3.5 (1)	1 (1=)	47(2=)	8.2 (2)
<i>Hoist</i>	19 (1)	4 (2)	4.8 (4)	56 (1)	9.9 (4)
<i>Slide sheet</i>	14 (2)	5 (3)	1.4 (3)	33 (4)	9.3 (3)
<i>Manual</i>	12 (3)	7.5 (4)	1 (1=)	47 (2=)	7.9 (1)

The belt technique was observed to be a successful option in this study but it was not very popular with only six participants choosing it, from organisations with an average score of 47%. This technique gave the quickest average time taken to perform the task (1 minute). The REBA score was the lowest at 3.5 giving a low-medium risk level and that action is necessary/maybe necessary. The Borg scale gave an average score of 8.2 which was the second lowest.

Nineteen participants chose the hoist and came from organisations with a high average score of 56%. The average time taken to perform the task was the slowest by a considerable margin at 4.8 minutes. The REBA score was the second lowest at 4 which indicates a medium risk and that action is necessary. The Borg scale was the highest of all the techniques at 9.9.

The slide sheet was chosen by fourteen participants from organisations with a low average organisational score of 33%. The slide sheet took the second longest time with an average of 1.4 minutes. The REBA score was the second highest with an average of 5 which indicates a medium risk and that action is necessary. The Borg Scale gave score of 9.3 which was the second highest.

The twelve participants selecting the manual technique came from organisations with an average score of 47%. The average time taken to perform the manual technique was the joint fastest at 1 minute. The REBA score was the highest at 7.5 indicating that there is a high risk and action is necessary soon. Conversely the Borg scale gave an average score of 7.9 which was the lowest.

5.2.5 Lying-to-lying transfer

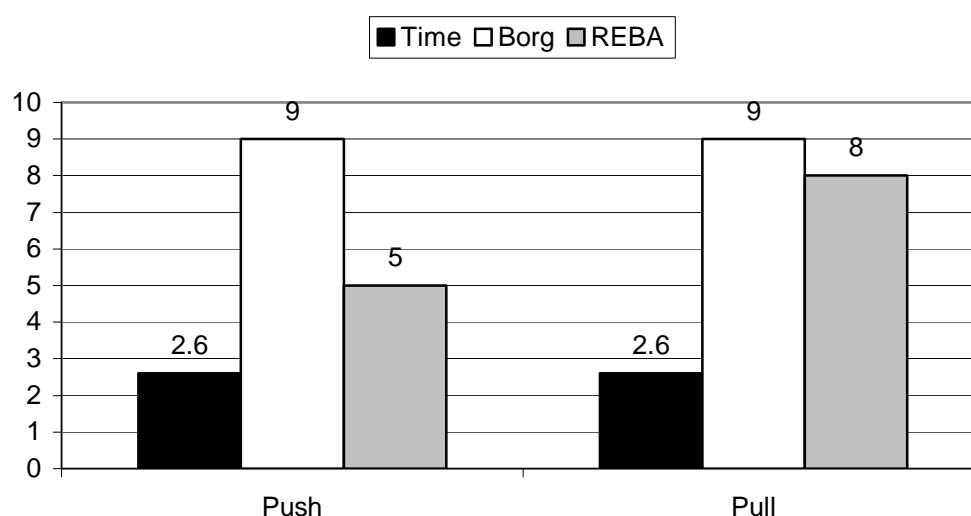
This task involved moving an unconscious patient from a bed to a trolley. Only one technique was selected by participants to perform this task using a limited range of equipment. The equipment choice was essentially the same with nearly all participants using a pat slide to bridge the gap between the bed and the trolley and a slide sheet, a bed sheet, or both to slide the patient on top of the pat slide. Occasionally extension straps were used in addition to the slide sheet. The technique is shown in figure 10 below:

Figure 10 Lying-to-lying



The summary observation findings are shown in figure 11 and table 9.

Figure 11 Observational data for lying-to-lying transfer



Four participants were present for most sites and in many cases they tended to swap positions frequently. Therefore it was not practical to use the same technique for analysis as for the previous two tasks, i.e. scoring every 10 seconds. Instead the highest risk moment for both pushing and pulling was selected (as the weight of the patient was taken) and a REBA analysis performed on the participant in best view at that moment.

The data were analysed for the pushing and pulling sections of the task and it was found that pulling resulted in an average REBA score of 8, whilst pushing resulted in an average score of 5. The Borg scale and time taken were the same. The average REBA score for this task was 6.9 but when extension straps were used this fell to 4.6, suggesting that the use of extension straps contributes to a lower level of postural risk.

Table 9 Summary data for lying-to-lying transfer

<i>Equipment/technique selected</i>	<i>Number of Participants</i>	<i>Ave. REBA Score</i>	<i>Time Taken (mins)</i>	<i>Ave. Org. Score (%)</i>	<i>Ave. Borg Score</i>
<i>Pat slide, slide sheet or bed sheet, +/- extension straps</i>	15	6.9	2.6	47	9

5.3 INTERVIEW DATA

5.3.1 Verbal protocol analysis

The data analysis involved iterative steps to ensure that all data were accounted for and included in the final results as shown in figure 12. As a first step a verbatim transcription was made from each audiotape. An example of the empirical data is in figure 13. It should be noted that although this analysis is thematically based (rather than linguistically) the transcriptions include grammatical errors and poorly structured sentences to preserve the pattern of decision-making but the data were not annotated for analysis of the construction and timing of speech.

Figure 12 The iterative collection and analysis process

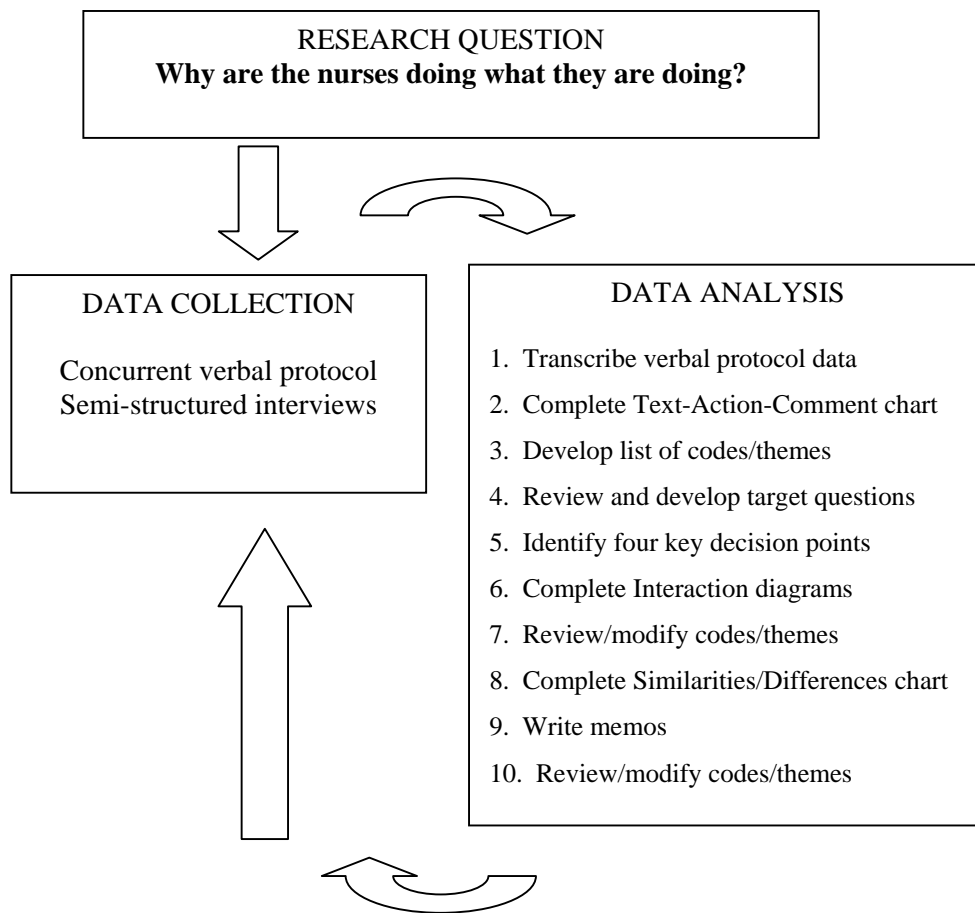


Figure 13 Example of empirical data for VPA

Good morning hello and how are you today [okay thank you].
My name is [**] and this is my colleague [**] and how are you today [okay thanks] so just what we want to do is assist you in changing your trousers and make sure we keep an eye on your arms so the first thing we're going to do is.... gently remove your shoes because we don't want to be shaking you or something like that so we just want to check and remove your shoes ... and after we change your trousers we will put your shoes back so that's we have some grip something to hold onto we have to prevent you from slipping.
Okay. do you have any questions... [No I'm fine thank you] that's okay...
Alright...okay so we're just going to take your shoes off. that's it.. okay gently take this one off as well so we try to put the two feet together so that you will be able to stand firm and it will prevent you from slipping into different side... all right... are you comfortable? [Yes, thank you] that's okay now we do the..... trousers.....until to the knee.
Okay then after that we will sort of gently roll you over to one side and then to the other just to get the pyjamas... [up to the back] and while we are doing it one by one [**] is very close to you.. so to prevent [**] as well to hurt his back so she has to walk very close to you... the left side I will do the same thing.

And we don't like to be leaning you know... over you as well because... alright [okay] so...that's alright so the next thing now,... is that we assist you in gently move to one side so that [**] will put on the trousers today...one two three... [patient is rolled to one side] are you alright? Is that comfortable? [Yup] we are just going to do the same... roll over to me one two three [patient is rolled to other side] okay lets put the shoe back... just going to put your shoe back on... this is for some support that's it.. okay then.. so.. the next thing we gonna do is just to make sure we put your trousers on properly...to prevent pressure sores and wrinkles....while we are doing... how we are going to that ... because we understand we can't use your hands to support... but we will support you at the back...on the count of three... please do you mind leaning forward for me [patient leans forward] one two three you okay [Hmm hmmm] we're just going to pull your pyjamas [Thank you.] you alright... you comfortable [Yep] Thank you very much thank you.

Text-action-comment charts (table 10) were used as a tool to identify the four key decisions points the nurses used in the process of carrying out the task. The concurrent verbal protocols were separated into phrases (meaningful chunks) and then grouped into four categories relating to the four decision points. When recording real-time data there is a risk of task distortion due to the activity of verbalising so themes were also explored in the semi-structured interviews. This resulted in a list of intermediate codes and themes (figure 14) which were related to the key decision points.

Figure 14 Intermediate codes

1.0	Nurse's approach to patient handling	5.0	Environment
1.1	physical – kneeling, crouching, standing, facing	5.1	space
1.2	mental – attitude	5.2	time
1.3	holistic	5.3	management
2.0	Communication to patient	6.0	Use of equipment
2.1	degree, how much	6.1	rationalise it's use/disuse
2.2	content	6.2	promote patient independence
2.3	purpose	6.3	suitability of (ie. low chairs)
	2.3.1 purpose of task	6.4	not enough equipment
	2.3.2 purpose to educate	7.0	Attitudes of patients
3.0	Assessment of risk	7.1	positive
3.1	match patient's abilities to nurses' abilities	7.2	negative
3.2	ensure patient safety	8.0	Attitude of nurses
3.3	ensure nurse safety	8.1	positive
3.4	perception of nurse safety	8.2	negative
4.0	Communication with other nurses	9.0	Beyond nurses' control
4.1	teamwork	9.1	staffing levels
4.2	differing perspectives	9.2	provision of equipment
		9.3	space
		9.4	time
		10.0	Accountability/Responsibility of nurses

Interaction diagrams (figure 15) were created to visually display the various interactions of interest which related to the decision-making factors during the task. These diagrams were a key tool to capture the themes and allowed strong dominant themes to emerge from the data.

The themes were separated into four interaction areas: nurse-patient, nurse-equipment, nurse-nurse, and nurse-task. It was anticipated that nurses would draw on their training to both choose methods and optimise their own physical postures in an attempt to reduce their exposure to risk and complete the task safely. However the development of questions resulted in alternate themes being generated which focused on the limitations that the nurses encountered in the workplace. These limitations influenced their decisions and often prevented them from using the optimum techniques, equipment and communication patterns during patient transfer tasks.

Table 10 Text-Action-Comment Chart

Text	Action	Comment
N1: good morning *** we need to stand you up so we'll take the pillow from underneath your arms	N1 and N2 greet patient and tell her what they plan to do. N2 removes pillow from patient's lap.	
N1: we'll make sure your feet are nice and square on the floor so that you can support your weight on them when you stand	N1 crouches to floor to position patient's feet flat on floor.	
N2: what we'd like you to do is lean forward and wiggle your bottom right side then left side to the front of the chair	N1 stands on left side, N2 stands on right side of patient, both place a hand on her upper back and cue her to lean forward. <u>N2 explains how to wiggle forward, patient is able to wiggle forward independently (lifting one buttock at a time, alternately) until she gets to the front edge, without using her arms.</u> Both N1 and N2 keep a hand placed on her back when she is wiggling forward.	
N1: that's very good N1: I think that's enough	N1 stops patient from moving further forward in the chair.	
N1: on the count of three we're going to ask you to take your weight through your legs	N1 explains what they would like her to do in order to stand. [N1 is blocked from view by N2]	
N1: and then actually stand up and push yourself forward	[N1 is blocked from view by N2]	
N1: rather than backwards	[N1 is blocked from view by N2]	
N1: and we'll help support the top half of you so that you're not toppling over	N1 and N2 both face patient, use their feet to block patient's feet. N1 places left hand at patient's low back and right hand in front of patient's right shoulder.	
N2: on three..... One two three push	N2 counts, and after count of three, patient pushes up with legs, N1 and N2 assist patient into standing position.	

Figure 15 Interaction Diagram

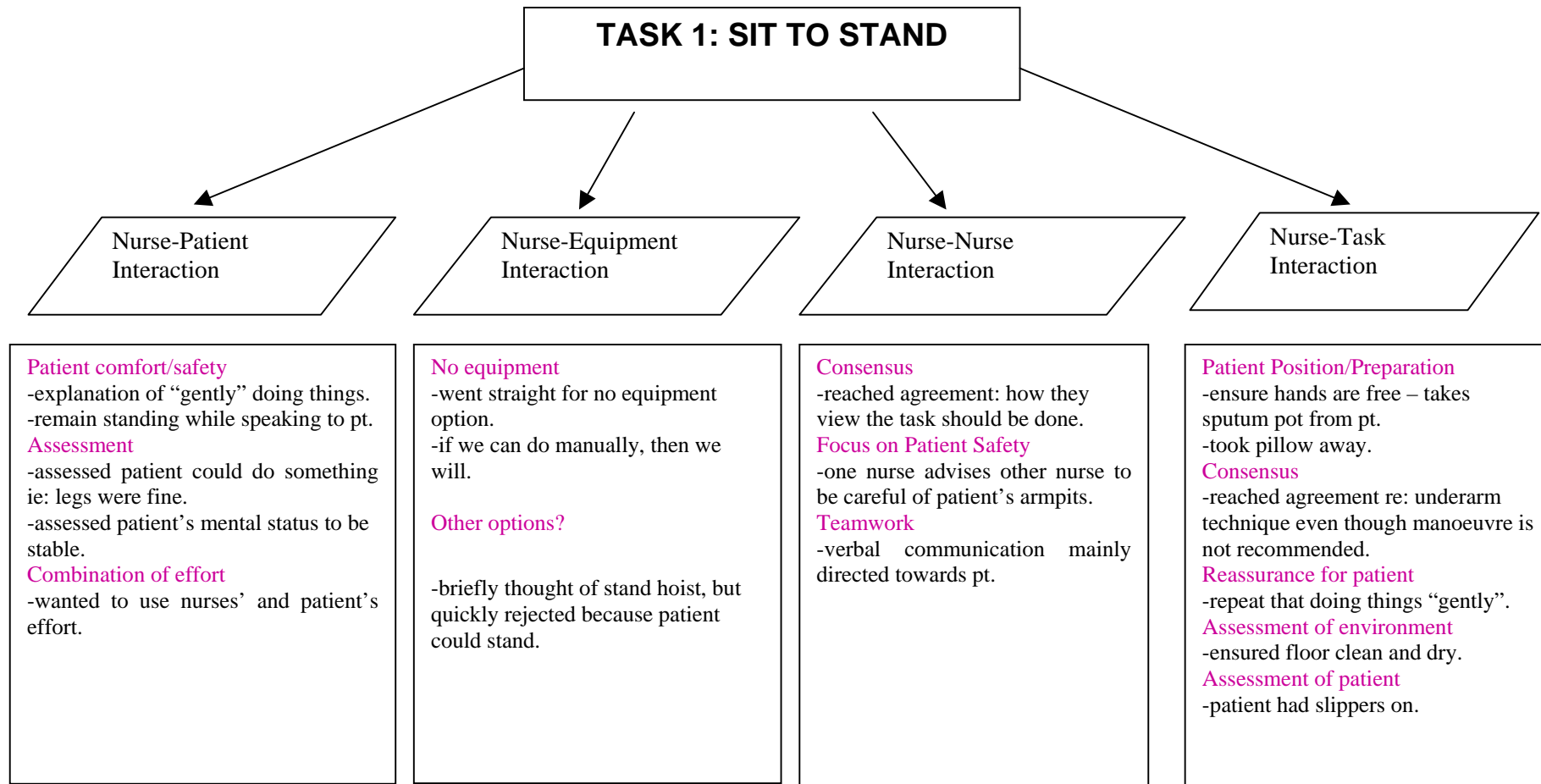


Table 11 Similarities and differences

Similarities	Differences
<ul style="list-style-type: none"> Both used sling and hoist to reposition patient sitting in chair. Both asked patient about their abilities prior to getting hoist. Both said hoist was easiest and safest for patient and for nurses. 	<ul style="list-style-type: none"> N1+N2 introduced themselves to the patient by first name, while N3+N4 only said hello. N1+N2 didn't retrieve patient's shoes, whereas N3+N4 did. N1+N2 reassured the patient verbally: calling the hoist a "special machine that will help us lift you", "don't worry", "it looks complicated, but it's really simple". N3+N4 did not verbally reassure patient. N1+N2 communicated their entire procedure to patient, whereas N3+N4 were more sporadic in communicating to the patient. N1+N2 performed the task smoothly and fluidly, while N3+N4 did not – patient almost slid out of the chair just before N3+N4 started lifting the hoist. N1+N2 rolled pt side to side to feed sling under patient's bottom first, then brought it up his back. N3+N4 asked patient to lean forward and hold that position while they fed the sling from the top, down her back, and then under her legs. N3+N4 didn't get the sling positioned correctly the first time and had to adjust, while the patient was left in the forward leaning position. N1 placed a hand on the patient while he was in the sling at all times, when lifting, lowering and repositioning. N3+N4 only guided the patient back into the chair to reposition. N1+N2 lowered themselves in synch with the patient being lowered. N3+N4 remained in a standing position while patient was being lowered. N1 stayed with the patient while N2 retrieved hoist, whereas both N3+N4 left patient to retrieve hoist. N1+N2 did not use the brakes on the hoist. N3+N4 applied the brakes when the hoist was positioned as close to the chair prior to hooking up the sling and lifting the patient. The brakes were taken off prior to the patient being lifted.

The emergent themes were compared and contrasted across the sites to clarify concepts and explore the interpretations by combining at the video and audio data and scrutinising for similarities and differences as shown in table 11.

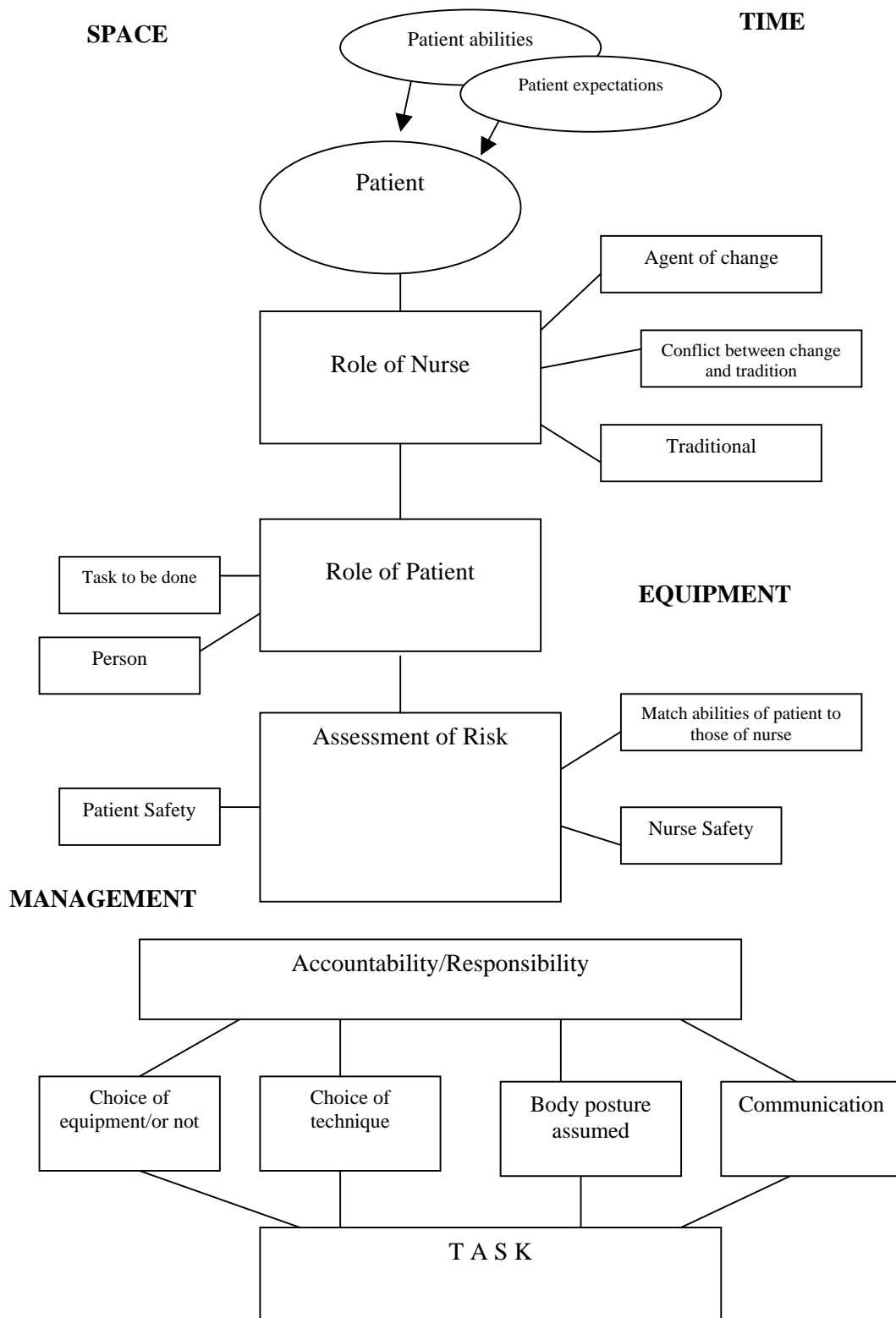
The final themes (figure 16) and proposed model (figure 17) were discussed with the other members of the project group and a small group of Allied Health Professionals. It was felt that different nurses showed different approaches to the patients and that the interactions between (1) the patient and the nurse, and (2) the nurse and the environment shaped how the decisions were formed and the task completed. Some of the factors were felt to be beyond the nurses control for this study: space, time, management support and provision of/access to equipment.

The model suggests a linear patten of decision making, whereas the demonstrated behaviours from the VPA indicated that behaviours were not linear, there were no clear decision points and themes seemed to overlap. These findings are further reviewed in the analysis of the semi-structured interviews were a more probing approach was taken to explore the impact of training on decision-making in the following section.

Figure 16 Final Codes and themes

1.0	The patient
1.1	patient expectations and abilities
2.0	Role of nurse
2.1	agent of change
2.2	traditional
2.3	conflict between 2.1 and 2.2
3.0	Role of patient
3.1	represents task to be done
3.2	is person with some capabilities
4.0	Beyond nurses' control
4.1	staffing levels (time)
4.2	provision of equipment
4.3	space
4.4	management
5.0	Assessment of risk
5.1	match patient's abilities to nurses' abilities
5.2	ensure patient safety
5.3	ensure nurse safety
5.4	equipment – confidence, skill, appropriateness
5.5	space - no obstacles, hands free, shoes/slippers on
6.0	Accountability/Responsibility of nurse
5.1	communication
5.2	avoid manually lifting patients
5.3	legislation awareness

Figure 17 Proposed model for themes from VPA



5.3.2 Semi structured interviews

The tapes of the semi-structured interviews were transcribed and then the participants' statements were categorised into four broad categories

- Patient assessment
- Equipment/technique assessment
- Task and environment assessment
- Alternatives mentioned

Tables 12 and 13 were created for the sit-to-stand and repositioning-in-sitting tasks in order to capture the decision points and analyst thoughts. A table was not created for lying-to-lying as the decision-making for this task was found to be minimal. Extracts of the empirical data and field notes for each category are given below.

Assessment of patient

Tried to see how much patient could move – restricted so only safe way was to hoist

Considered how old she was tried to get her to move her own bum – only could use hoist or she would have to be lifted

Documented that patient very weak and not good on legs – not good sitting balance

Thought that slide sheet would enable to just slide him – but needed more cooperation from patient

Assessment of equipment/technique

Hoist appropriate equipment – gives us and patient positioning without much effort

Assessment showed that hoist only good option for patient and nurses –comfort and safety good for both

Lifting belt better than no equipment – would have to have her under the arms – a bad lift and not particularly safe

Slide sheets good if cooperative - but have to get them out quickly as patient will slip back down

Belt - equipment is more comfortable for patient

Assessment of task and environment

Managed to sit her, was safe not necessarily easier for us

Need space, move all furniture before start

More complicated task in assessing the risk factors, in danger of slipping off the chair – hoist therefore safest option

Primary workload is moving furniture

Alternatives mentioned

Before would have manually done it, during training more likely to use hoist but ward experience use slide sheet

In ideal world could have 3 people – but not actuality of wards

Never use hoist do not have access

In real life, all wards have hoists and 2 batteries, so easy to use, use hoist if do not know how well the patient moves themselves – then do a proper assessment later

Prior to training may have used a drag lift – now rarely happens on the wards

Table 12 Sit-to-stand transfer decisions

Decision making criteria	Belt	Manual technique	Thoughts during analysis
<p>Patient Assessment Attributes of the patient given in the scenario:</p> <p>Attributes of the patient derived from the scenario given and mock up with model:</p>	<p>1.Able to stand and weight-bear 2.Unable to use arms 3. Adequate sitting balance</p> <p>1. Needed just a small amount of assistance 2. A large person might be unstable standing up 3. Unable to do this if not compliant patient</p>	<p>1. Ability to stand and weight-bear 2. Unable to use arms</p> <p>1. Able to move forward without assistance 2. Small person 3. Unable to do this if not compliant, would have used equipment 4. Patient scared</p>	<p>Same reasons for both decisions given in scenario</p> <p>Manual technique seems to apply more imagination -?? greater need to justify choice?? – e.g. patient scared Both assume a compliant patient</p>
<p>Justifications for choice of equipment/technique</p>	<p><i>Patient factors</i> Most comfortable for patient Patients do as much for themselves as possible. Patient did a lot for themselves, gives self satisfaction</p> <p><i>Nurse factors</i> Safest for nurses. Nurses not taking any weight Nurses not bending and twisting Environment/equipment Taught like that in training Got hold of patient, got control of situation Work as a team with the patient Alternative is an underarm lift Advantage to keep patient in right</p>	<p><i>Nurse factors</i> Gives patient balance so less strain on the nurse (from nurses who performed a BEAR HUG transfer)</p> <p><i>Patient factors</i> Cannot use arms but need to keep legs moving to promote independence Patient prefers personal contact</p>	<p>Many more reasons from belt users. Best one from manual technique people is promoting independence</p>

	position If no belt would hurt ourselves as would lift rather than move patient Support patient to stop them sliding off		
Task Assessment Efficacy and safety Technique/Actions	1. Get close 2. Ensure patient position is optimal 3. Normally ask patient to push up themselves 4. Verbal guidance 5. Transfer weight to help patient to stand 6. Look ahead, not at patient 7. Can take equal weight, not both in same position		No actions explained by manual technique -?? shows more training for belt people – or that manual technique is not considered to need these thoughtful movements or justifications ??
Alternatives mentioned	1. Could have used waist band or patient belt 2. Belt better than no equipment 3. Thought of standing aid, but patient cannot use their arms	1. Belt – but patient was small enough/uncomfortable 2. Standing hoist – but no arms	All considered other equipment

Table 13 Repositioning-in-sitting decisions

Decision making criteria	Slide sheet	Hoist	Belt	Manual	Thoughts during analysis
PATIENT ASSESSMENT Attributes of patient given in scenario Attributes of patient derived from the scenario and mock-up	Unable to help Unable to weight bear Has pain-free legs so can push down on them Did not work as patient unable to co-operate, no sitting balance Co-operative If patient overweight would have to use a hoist Was in chair to start-assumed safe in chair	Unable to stand Weak Not good sitting balance Unable to take any weight Patient fragile Unable to do it them-self Uncooperative – unable to do it themselves Hoist if very big or patient unco-operative	Patient able to help	Patient able to help	Belt users assumed that patient able to help more, so maximising the patient contribution Not as much assessment of patient ability (problem with setting a scenario) – open to interpretation - scenario does NOT say UNABLE to help or NO sitting balance) Slide sheet did not actually work for a couple of participants – reasons given as part of the scenario - ?? because a hard technique Good patient assessment?? – in a chair to start therefore safe in chair (again scenario open to interpretation)

Decision making criteria	Slide sheet	Hoist	Belt	Manual	Thoughts during analysis
Justifications for choice of equipment/technique	<p>Patient factors: Easier and more comfortable for patient Was safe Maintain independence</p> <p>Nurse factors: Not necessarily easy Training says use a hoist but ward experience use slide sheet Training has helped to use the slide sheet</p> <p>Equipment environment: Don't need a lot of space Quicker Need to prevent sliding down again Simple and effective Patient will slip back down if not removed quickly Maintains patient independence</p>	<p>Patient factors: Gives confidence Comfort and safety good for nurse and patient Patient scared Problems with patient dignity and privacy Uncomfortable with respiratory problems Need to explain as can be strange Traumatic to use</p> <p>Nurse factors: Nurses feel comfortable if patient fragile Comfort and safety good for nurse and patient If the patient suddenly goes off damage will be done to the nurse if no hoist Need more than 2 nurses</p> <p>Equipment environment Works with just 2 nurses – don't have to wait for more staff Hoisting takes longer</p>	<p>Patient factors: Won't feel as if they will fall or slip Need some strength from patient Keeps patient mobility Give patient confidence and physical reassurance More comfortable for the patient</p> <p>Nurse factors: Easier for nurse</p> <p>Equipment environment Single piece of equipment Better than slide sheet</p>	<p>Patient factors: Maintain independence</p> <p>Nurse factors Watch own posture – avoid bending in the middle</p>	<p>More nurse reasons for hoist More patient reasons for belt Hoist is more cautious option Very few reasons given for manual choice?? Less problem solving ability from staff Hoist negative reasons about patient non compliance - TIME</p>

Decision making criteria	Slide sheet	Hoist	Belt	Manual	Thoughts during analysis
Task Assessment Efficacy and safety Technique/Actions	Facilitating move, not actually moving patient Not as easy as expected Legs up when patient leans forward for more support Have to bend to get sheet in, better to bend knees Footplate off Brakes on Patient slippers on to prevent sliding down Easier for a tall person to be at the back	Hoist does most of the work Sling must be the right size Hoist may not complete manoeuvre – may still have to move the patient back Hoisting takes longer	Doesn't give momentum, no physical help, need lots of help from the patient Held on to arms of chair Use belt to support whilst patient uses arms Try to get patient to move back with belt, use knees Encourage patient to do it herself If no belt tend to put arms under shoulders, not good (drag lift)	Patient to lean forward and shuffle bottom back Encourage to do it themselves	Slide sheet – faults with technique/equipment Hoist doubts about ability to complete task - ? problem with staff / training Belt - limitations of techniques and training point Time issue for hoisting – but safest (?? Real life decisions) Most detailed actions given for belt and slide sheet -?? Hoist is considered to be an equipment action not human action so not so many details given
Alternatives mentioned	Could have used a hoist but this keeps patient mobility	Other equipment considered but scenario showed that hoist only way Tried to get her to do as much for themselves as possible Hoist or lifting Belt not used because they could not support own weight	If doesn't work use the hoist Better than slide sheet		All considered other equipment - They were asked directly!!

6 DISCUSSION

This section aims to discuss the results in terms of the intellectual question of whether a high organisational score (high compliance with RCN competencies) was found with low REBA scores (low postural risk) and good decision-making (evidence of options considered).

This study was designed to firstly measure the compliance of organisations by using a question set, then by using observation techniques to consider the manual handling behaviour of staff and thirdly to use interview techniques to explore decision making – whether the equipment selection and performance of the technique were influenced by training and education. The concurrent verbal protocols explored the decision-making during the performance of each task and the semi-structured interviews sought more detail with respect to the influence of training and education.

The discussion will consider each of the tasks in turn by summarising the results from table 14 in the format of three flowcharts.

Table 14 Summary data

<i>TASK</i>	<i>Equipment /technique selected</i>	<i>No. of participants</i>	<i>Ave. REBA Score</i>	<i>Time Taken (mins)</i>	<i>Ave. Borg Score</i>	<i>Ave. Org. Score (%)</i>
<i>Sit-to-Stand</i>	<i>Belt</i>	32	3.4 (1)	1.3 (2)	8.5 (1)	51 (1)
	<i>Manual</i>	24	7.4 (2)	1 (1)	8.8 (2)	39 (2)
<i>Repositioning in sitting</i>	<i>Belt</i>	6	3.5 (1)	1 (1=)	8.2 (2)	47 (2=)
	<i>Hoist</i>	19	4 (2)	4.8 (4)	9.9 (4)	56 (1)
	<i>Slide sheet</i>	14	5 (3)	1.4 (3)	9.3 (3)	33 (4)
	<i>Manual</i>	12	7.5 (4)	1 (1=)	7.9 (1)	47 (2=)
<i>Lying-to-lying</i>	<i>Pat slide etc.</i>	15	6.9	2.6	9	47

Each flowchart is very simple in its structure. Although the decision points are indicated they do not reflect a sequential process, but merely highlight the key aspects in each task as indicated in the VPA analysis (section 5.3.1) where the demonstrated behaviours were not linear.

6.1 SIT-TO-STAND TRANSFER

The scenario for this task was very specific in narrowing the choice to two possible techniques (figure 18), the handling belt and a manual technique. The advantage of using scenarios was that participants were able to problem-solve and react as they would when presented with a problem in a ward situation. However for this scenario the intention for limiting the use of the patient's upper limbs was to emphasise the level of help needed. In practice it led to the participants to discarding the option of the standing hoist. Back Care (1999) specifies that most standing hoists are designed to be used with patients who can partially weight-bear and have some arm strength, however there are also some models which are suitable for more dependent patients. This study did not include the latter group as an equipment option.

The most popular technique was the belt, which was used by thirty two participants. According to the literature (Hignett et al, 2003) and best practice guidelines (Lloyd et al, 1998, Back Care 1999) the handling belt is the most acceptable technique and it was found to

be a successful option. The difference in the Borg score was small, at just 0.5, suggesting that perception of exertion is not a factor in the choice between manual and belt for this task.

Twenty four participants chose a manual technique despite the literature against the best practice recommendations in the literature and professional guidelines. According to the literature (Hignett et al 2003) there is limited evidence that a manual technique is acceptable as long as the patient weighs less than 16.9kg. Both the bear hug and drag lift techniques were observed during the study and these are generally considered unacceptable.

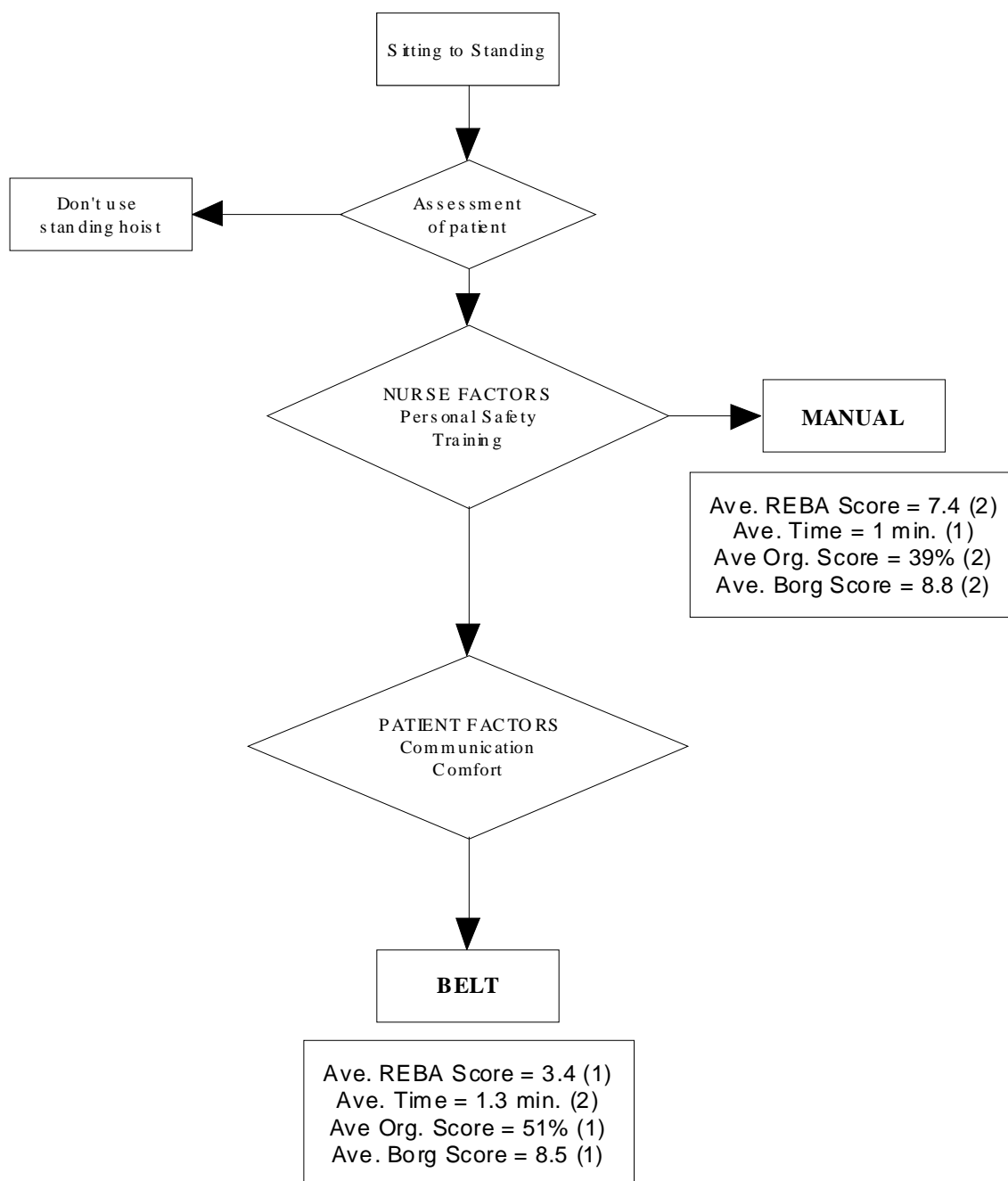
The manual technique was faster by 20 seconds. This is not a great difference in actual time but it is a 37% increase in time taken, and may go some way to account for some participants preference for a manual technique, despite the professional guidance and the evidence base. From the analysis of the semi-structured interviews it seems that the participants performing the task manually made fewer decisions and showed less evidence of problem solving than those choosing the belt. There are some good reasons given to the use a manual technique, although these also apply to the belt, and the participants using it offered justification for their choice.

Most of the literature points to the use of the standing hoist for this manoeuvre, however with this option removed due to the abilities of the patient the choice was between a manual technique and a belt. The evidence base and the best practice guidance both clearly recommend the handling belt and the study found that participants using the handling belt came from organisations which had higher organisational scores, had a lower REBA score and displayed a greater ability to problem solve.

6.1.1 Summary of key issues for sitting-to-standing task

- This task could be achieved using two options: handling belt and a manual technique.
- The handling belt was the safer option for this task as shown by the lower REBA score (postural risk) and Borg Score (physiological exertion).
- The handling belt is recommended in professional guidelines for this task.
- Organisations with a higher level of compliance with the RCN competencies were found to be using the belt.
- Therefore organisations with higher level of compliance with RCN guidelines will have safer working practices for this task.
- Safer working practices should result in less staff injury and patient risk.

Figure 18 Flowchart for Sit-to-Stand transfer



6.2 REPOSITIONING IN SITTING

This task presented the most options with participants choosing between a hoist, handling belt, slide sheet and manual technique (figure 19). According to the research literature (Hignett et al, 2003) the handling belt is the most appropriate technique. It is also mentioned briefly in the professional guidance for this task although much greater emphasis is given to eliminating the task by taking measures to prevent the patient slipping (Back Care, 1999, Lloyd et al, 1998).

In this study the handling belt was found to be the least popular option with only 12% (6 out of 51) participants using it, but where it was used the REBA score was low. The lack of popularity might be due to the status of recommendation in current practice guidelines. The average organisational scores where the belt was used indicate that it was chosen by organisations with poor to average levels of compliance.

The hoist was the most popular technique. It is an acceptable technique according to the literature (Hignett et al, 2003) and is documented as accepted best practice (Lloyd et al, 1998). For the scenario in this project it is perhaps a cautious option, however best practice recommends that it is better to reduce risk by using a hoist if in doubt about the patients abilities. So training would seem to support the hoist as the technique of choice but the results found that it took the longest time, and so also had a high Borg score. The questions that arising from the results are:

- Why is the hoist popular if it is the slowest option?
- Would the hoist be used if the BCA was not in the room?

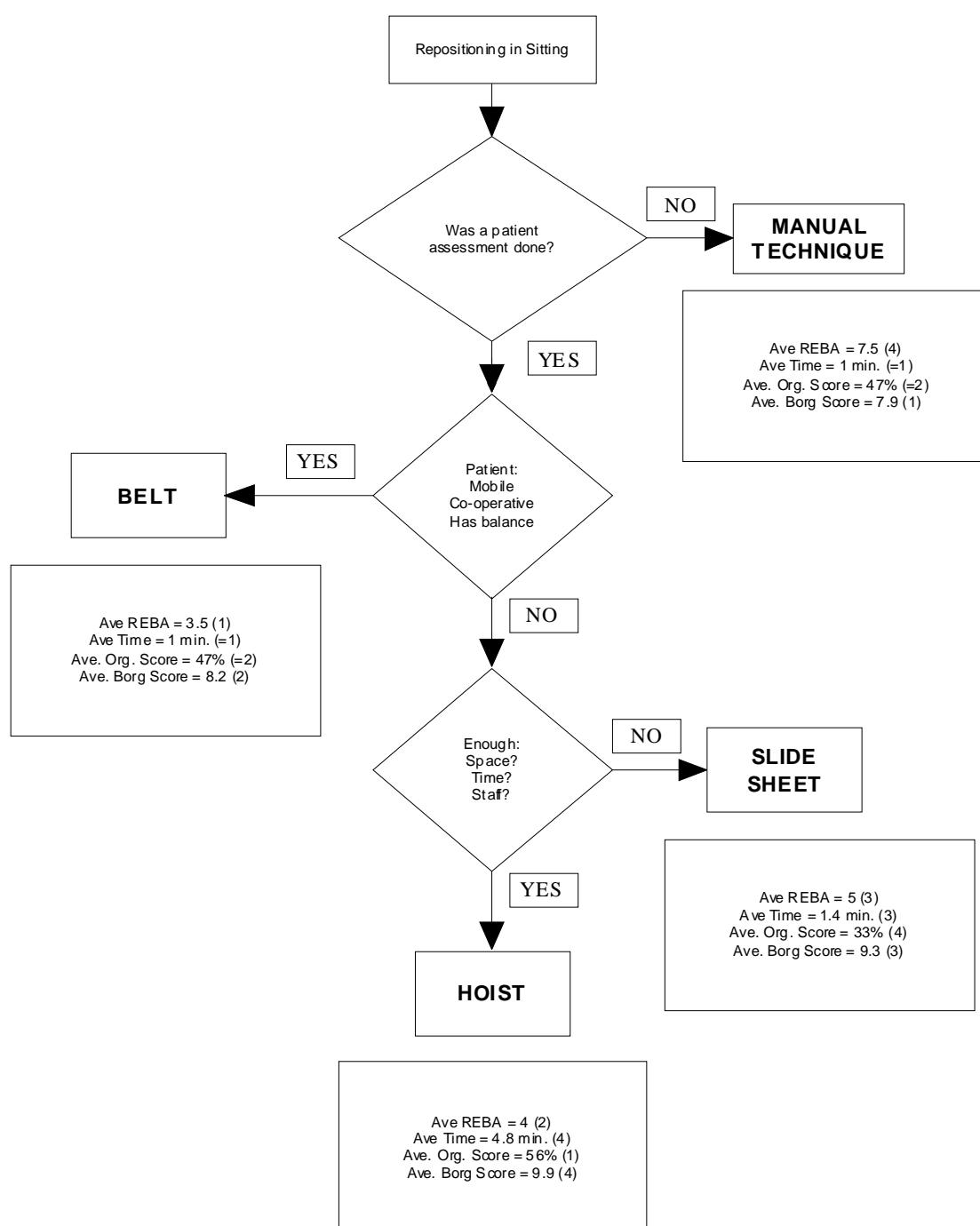
The hoist was chosen by participants from organisations with the highest average organisational scores which might support the conclusion that it is the technique most recommended in training for this task.

Slide sheets were found to have lower REBA scores and were chosen by participants from organisations with the lowest average organisational scores (33%). Although there is no research evidence to support the use of slide sheets they are considered to be an acceptable technique for this task in the professional guidance (Lloyd et al, 1998, Back Care 1999). However problems observed during this study included patients sliding off the chair or back down the chair after the manoeuvre, and indeed two unsuccessful attempts occurred (and were abandoned) as well as several difficulties.

The manual technique is considered to be unacceptable unless the patient is able to take most of their own weight according to professional guidance (Lloyd et al, 1998, Back Care 1999). Two controversial techniques were observed, a bear hug and a drag lift, in addition to other manual techniques such as hip hitching and encouraging the patient to bottom shuffle. The literature provides evidence that the drag lift exceeds acceptable limits and also that the pivot, or bear hug if performed by one person is more risky than other techniques performed by two (Hignett et al, 2003). The time taken to perform a manual transfer is perhaps an element contributing to its popularity, however the belt transfer is nearly as quick, but the manual was rated as low for perceived exertion but with the highest REBA score (high postural risk). The belt and manual techniques were the quickest and this perhaps accounted for the popularity of the manual technique but did not explain the lack of popularity of the belt.

The analysis of decisions and justifications from the VPA and semi-structured interviews found more problem-solving behaviour occurred with the use of the hoist, slide sheet and belt and less with the manual technique. The participants using the belt in this study did not discuss aspects about space, time and staff, which is reflected in the decision-making representation in the flow chart.

Figure 19 Flowchart for repositioning in sitting



It is likely that the hoist and slide sheet options are recommended in training based on the professional practice guidance. In this case there is a discrepancy between accepted best practice and the research evidence where the use of a handling belt is recommended for this task. This selection of techniques to complete the task perhaps raises questions about the content of training programmes. The time taken to use the hoist might restrict its use in real time and the difficulties with slide sheets suggest they are also not an adequate solution. The manual techniques had a high REBA score and so should not be recommended. The belt is clearly the best option, but is not frequently chosen. Given the current recommendation in the best practice guidance it is likely that the participants are actually following their training.

6.2.1 Summary of key issues for repositioning-in-sitting task

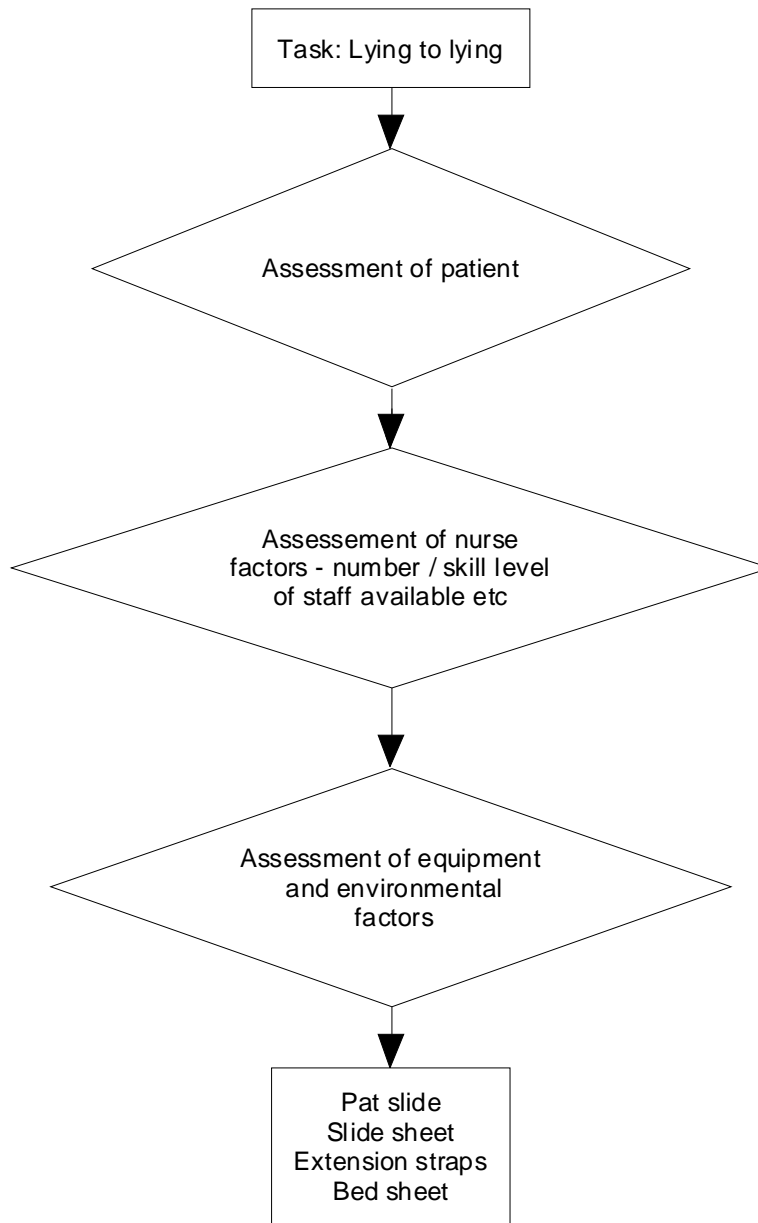
- This task could be achieved using one of four options: handling belt, hoist, sliding sheet and a manual technique.
- The handling belt was found to be the safest option from the combination of the REBA score (postural risk) and Borg score (physiological exertion).
- Professional guidance recommends the use of a hoist for this task.
- Organisations with a high level of compliance with the RCN competencies were found to be using the hoist, suggesting that they are following professional guidance from training and education sessions and have access to this equipment, with appropriate supervision.
- The research evidence supports the use of a handling belt for this task.
- The handling belt resulted in a lowest REBA score and was the fastest option.
- The use of a slide sheet is included in professional guidance but was only used by organisations with a lower than average organisational score.
- The use of the slide sheet resulted in poor REBA and Borg scores.
- The manual technique is actively discouraged in professional guidance and has also been found to be unsafe in the research literature.
- The manual technique was found to have the highest postural risk.

6.3 LYING-TO-LYING TRANSFER

There is no evidence to support the selection of any particular equipment (Hignett et al 2003), but professional guidance is explicit (Lloyd et al, 1998) and this is reflected in the consistent approach which was found throughout the research sites (figure 20). The scenario was clear with an unconscious patient. Nearly all participants performed the same technique in the same way with some very minor differences. Best practice guidance and general observation indicates that indeed this task is performed to a standard technique throughout the UK and is probably least likely to show any differences according to the criteria for this study.

Slide sheets, Pat slides and bed sheets were chosen by most of the participants with a few choosing extension straps in addition to slide sheets. The average REBA score for this task was 6.9.

Figure 20 Flowchart for lying-to-lying



6.3.1 Summary of key issues for lying-to-lying task

- The lying-to-lying task was carried out using the same equipment (pat slide) and technique by all participants which only very minor variations.
- The variations involved the use of slide sheets and bed sheets on top of a pat slide.
- Some participants used extension straps with the slide sheets, resulting in a lower REBA score.

6.4 QUESTION SET

The results from the organisational question set seem to be in agreement with the findings for the individual tasks as set out in sections 6.1-6.3. The tasks which presented options (1) and (2) demonstrated a higher degree of problem solving in organisations which scored more highly against the RCN competencies. This suggests that the themes in the question set were successful for identifying organisations which had safer working practices.

If the organisation had recently prepared for an external or external audit they were able produce information about the systems, the review processes and when changes had been implemented. This included both manual handling risk assessment and patient mobility assessment. In both cases examples were sought for central (generic) and local management processes. Where these were found it was felt that communication was flowing between the three levels of competency in the RCN recommendations: BCA, Supervisor and Ward Staff.

6.5 THE INFLUENCE OF TRAINING/EDUCATION

The findings from this project suggest that training and education have influenced the decision-making of the nurses. Where a decision was presented (sitting-to-standing and repositioning-in-sitting) the participants from the higher benchmarking organisations chose the options recommended in the professional guidance.

The sit-to-stand task produced results indicating that the training and education was likely to have influenced the decision to use between the handling belt rather than the manual technique. A higher level of problem-solving ability was demonstrated by the participants choosing the belt.

The repositioning-in-sitting task presented more options and showed a higher level of problem solving in the interview data. The participants from the highest scoring organisations selected the hoist, which is the most cautious option and did not maximise the patient input, whereas the participants from mid-scoring organisations chose the belt or manual techniques and those from the lowest scoring organisations chose slide sheets.

The next question must be about the content of the training and education programmes. If the higher scoring organisations, which had a lower postural risk and a higher level of decision-making, were found to be using a particular approach then this would present evidence to suggest that this approach could be used beneficially by other healthcare organisations. A brief survey to identify the approaches used by the BCAs found that all used a combination of approaches (two or more, section 4.1.1) which were adapted to suit local circumstances and individual preferences.

6.6 PROJECT LIMITATIONS

The limitations that we have identified for this project are as follows:

- Only one patient scenario was used for each task which limited the equipment and technique options. A wider range of patient scenarios and characteristics could challenge the findings by requiring the nurses to undertake more complex decisions in a real life situation.
- Collecting data through simulated activities rather than real tasks imposes a number of constraints on data. These mostly relate to the factors which were identified as

being beyond the nurses control: time, equipment staffing levels, management issues etc.

- The use of particular data collection tools, e.g. video taping, placed constraints on the postural analysis. Multi-direction filming would have enabled the postures to be viewed from more optimal positions.
- The presence of the BCA throughout the data collection may have altered the behaviour of the participants, e.g. sliding sheets were used unsuccessfully on two occasions so may have been chosen due to the influence of the researchers and/or the BCA and would not normally be used. This limitation was partially addressed by asking the BCA to leave the room during the semi-structured interview.
- The verbal protocol analysis only used data from five sites due to time constraints within the project. Further analysis would give an indication of whether theoretical saturation had been achieved.

7 CONCLUSION

The organisational question set provided an overview of the training/education programme which then determined how the patient, equipment/technique and task was assessed. The key components are identified in the figure 21, showing some of the topics which were included in the programmes at the hospitals in this study.

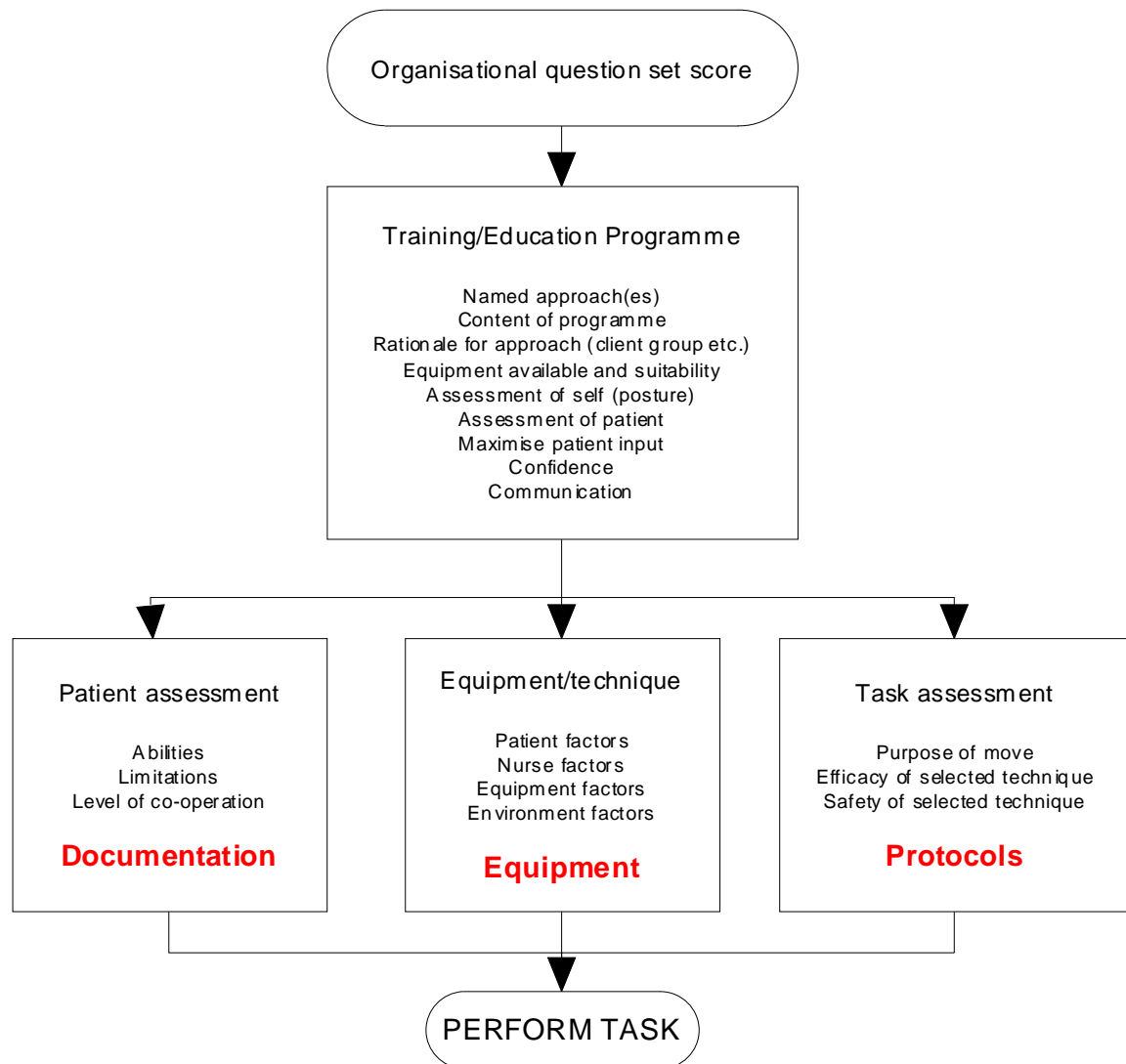
The three tasks presented different option levels as shown in the flowcharts (figures 18, 19 and 20). For lying-to-lying the participants basically all used the same equipment and technique to carry out a horizontal transfer. When two options were presented in the sitting-to-standing tasks the higher organisational score for the participants using the handling belt is likely to reflect the higher quality systems which are in place with respect to the RCN competencies. So the context for these tasks is dynamic and the decision-making will be iterative with nurses responding to live cues which are context and patient-dependent. As each task had a clearly defined patient description it could be argued that the results are only relevant for this specific scenario.

The key conclusions from this project are:

- The organisational question set provided themes for an initial screening process which could be used by HSE Inspectors to identify organisations scoring below 40% (appendix 4). In these cases it is likely that the evidence of compliance with the RCN competencies will be low and there may be cause for concern and further investigation.
- Organisations with low postural risk were found to have a higher compliance with the RCN competencies.
- Problem-solving provides an indication that the training and education is being transferred into practice, with staff using the information provided to guide their manual handling decisions.
- Professional practice guidance should be based on research evidence and should be reviewed and updated regularly to incorporate new evidence. This will then be transferred into clinical practice.

Compliance with the RCN competencies seems to reflect a higher level of problem solving, this is likely to be due to a greater level of supervision and support in the workplace, rather than training away from the work place.

Figure 21 Training programme content



8 RECOMMENDATIONS

The results from the project lead to the following recommendations:

1. Organisations could use the question set to self-screen their level of compliance with the RCN competencies.
2. HSE Inspectors can use an initial screening question set to identify healthcare organisations which will need an in-depth examination of their working practices, focussing on three areas:
 - a. Documentation (policies).
 - b. Equipment provision.
 - c. Protocols (training).
3. Part of this in-depth examination should include postural analysis of specific tasks to give an indication of the transfer of training and education into clinical practice.
4. Training and education for patient handling activities should be actively encouraged as there is evidence that it transfers into the decision-making process for patient handling tasks, although the actual content of the programme remains unclear.

8.1 AREAS OF POTENTIAL FUTURE STUDY

There are two main areas for further research in this area:

- **Real life manual handling behaviour.** The possibility of carrying out this study in 'real time' was discussed during the development of this project but was not possible within the available resources. However the use of CCTV in a ward environment is technologically possible and would offer an empirical examination of practice, although the ethical considerations would be complex.
- **Training programme approach/content.** In order to provide robust guidance on the approach to be adopted and content of training programmes it would be necessary to carry out a survey to look at:
 - Organisational question set score
 - Programme content in detail
 - Sickness absence and incident report trends

This would enable a definitive recommendation to be made with respect to the content of training programmes. It is anticipated that, based on the findings from this project, the organisations with higher question set scores also would have lower musculoskeletal sickness absence and manual handling incident levels and, by controlling for any extraneous variables, a conclusion could then be drawn with respect to the approach and content of the training programme.

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APPENDIX ONE: RCN COMPETENCIES

THEME 1 = STRATEGY AND POLICY IN ORGANISATION

Investigate with questionnaire to Back Care Advisor

Theme	PC no.	Performance criteria
1	5 11	E. Evidence of a rigorous audit trail to demonstrate effectiveness
1	6 12	F. Evidence that effective risk assessments have been completed with review dates and that they have been followed up
1	18	D. Evidence of implementation of care plans and understanding/reporting of problems or changes in risk assessment using TILE format.
1	23 32	B. Evidence of the development and implementation of a strategy to ensure organisational and local success in equipment provision, selection and usage. This includes facilitating and supervising MH supervisors and Line managers to understand the needs of their department and how to meet them
1	28	A. Evidence of influencing organisational change by providing evidence at strategic and operational levels of the implementation of actions identified following risk assessment, including review and evaluation of success
1	39	A. Evidence of the implementation of actions identified following risk assessment, including review and evaluation of performance within the local area
1	42	A. Evidence of contributing to the RA process within the local area including the ability to understand, evaluate and follow a basic TILE assessment
1	49 53 58	A. Evidence of a system for ensuring clear, legible, confidential records of RAs throughout the organisation, including evaluation dates, follow up and outcome information

THEME 2 = COMMUNICATION

Investigate with questionnaire and qualitative interviews with staff

2	2 8	B. Evidence of the development and implementation of a communications strategy throughout the organisation, including feedback to and liaison with clinical managers, board and individuals
2	3 9	C. Attendance at relevant strategic/operation organisational and departmental meetings.
2	4 10	D. Evidence of facilitating appointed MH supervisors and staff where appropriate to achieve success in safer MH
2	17	C. Evidence of attendance at hand-over and contribution to care planning and problem solving
2	30 41	C. Evidence of collaboration with all other key stakeholders, user groups and other staff. This includes networking links to groups within and outwith the organisation

THEME 3 = PHYSICAL BEHAVIOUR

Investigate by analysing risk level of body postures for 3 tasks

3	1 7	A. Evidence of the development and implementation of a system for monitoring and analysing safe systems of work, including the upkeep of detailed records
3	13	G. Evidence of compliance with all MH policies and procedures by all staff within dept.
3	15	A. Evidence of compliance with safer patient handling techniques and organisational and local safe systems of work.
3	21	G. Evidence of understanding body dynamics and safer patient handling principles using reflective practice skills.

THEME 4 = SUPERVISION

Investigate with qualitative study

4	14	H. Evidence of supervision of all staff including completion of records of competence in MH for each staff
4	19 57	E. Evidence of taking up opportunities for formal and informal education and discussing manual handling training needs with line manager.
4	20	F. Evidence of knowing when to stop and ask for help or guidance, including knowing risk to self of unsafe manual handling practices
4	23 31	A. Evidence of facilitating others and supervising organisational and local success in the risk assessment process including ensuring that line managers can understand and evaluate TILE risk assessments
4	33	C. Evidence of working with staff and BCA to ensure that equipment meets the needs of the client group
4	24 34	C. Evidence of facilitation of MH supervisors and line managers to ensure organisational success in enabling staff self-care in relation to M/S health. This involves formally and informally supervising the education of MH supervisors and line managers
4	25 35	D. Evidence of development and implementation of a strategy to ensure organisational success in evaluation of client needs in the context of safer handling practice. This will involve care planning and facilitating and supervising the education of line managers to ensure that they understand the MH needs of their client group
4	37	G. Evidence of supervision and problem solving with individuals and groups within dept. including identification of needs and shortfalls with staff and supplementing input where necessary.
4	39	A. Evidence of the implementation of actions identified following risk assessment, including review and evaluation of performance within the local area
4	48 61	G. Evidence of supporting co-workers to ensure that policy, procedures and dept. RAs are followed
4	50	B. Evidence of a comprehensive system for staff education which meets a legal standard and includes achievement of competencies by managers or appointed MH supervisors. Both formal and informal teaching included

THEME 5 = PERSONAL LIMITATIONS

Investigate with qualitative study

5	16	B. Evidence of ability to select and use appropriate equipment for client needs and safer patient handling
5	38	H. Evidence of recognition of own limitations by asking for help when needed and the documentation of that. That is taking responsibility for requesting help from the BCA when needed
5	44	C. Evidence of maintaining self-care in relation to M/S health.
5	47	F. Evidence of recognition of own limitations by asking for help when needed and the documentation of that

THEME 6 = EDUCATION AND TRAINING ATTENDANCE

Investigate with questionnaire and qualitative study

6	19 57	E. Evidence of taking up opportunities for formal and informal education and discussing manual handling training needs with line manager.
6	46	E. Evidence of participation in problem solving sessions and care planning for safer patient handling
6	52 57 63	Evidence of taking responsibility to enhance, up-date and develop appropriate knowledge and skills

OMIT

7	26 36	E. Evidence of advocacy between staff and clients, staff and organisation, and staff and staff
7	27	F. Evidence of advice to the organisation on appropriate equipment purchase strategy based on proactive audit, evaluation (including user trials) and selection for each dept. to meet client needs
7	29	B. Evidence of influencing and directing policy and practice including dynamic/changing (according to evidence) manual handling policy and procedures.
7	40	B. Evidence of implementing organisational policy and practice within the local areas and regularly reviewing results
7	43	B. Evidence of contributing to dept. decision making in eqmt provision, selection and usage to meet client needs
7	45	D. Evidence of ability to act as advocate for clients, that is understanding client needs – reflected in contribution to problem solving and care planning
7	54 59	Evidence of up-to-date care plans for all patients with RA integrated into the process
7	51 56 62	A. Evidence of evaluation of research, expert opinions and other evidence and the integration of new ideas into existing policies and procedures for continuous improvement in client care

APPENDIX TWO: QUESTION SET

	Question		Score
1	Was your last external audit within the last 2 years?	<i>Background information only, no score</i>	
2	Was your last internal manual handling audit completed within the last 2 years?	Yes <input type="checkbox"/> (score = 1)	
3	Was your last internal manual handling audit : <ul style="list-style-type: none"> • An equipment or training audit • A service provision audit • None 	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 0)	
4	Do you have a general manual handling risk assessment system? Is it: <ul style="list-style-type: none"> • Organisation wide • Local level 	Only give one score Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 1)	
5	Are completed manual handling risk assessments held: <ul style="list-style-type: none"> • Centrally • Locally • Both 	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 2)	
6	Are manual handling risk assessment reviewed at least annually in a: <ul style="list-style-type: none"> • Formal system • Informal system 	Only give one score Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 1)	
7	Are patient mobility assessment held in: <ul style="list-style-type: none"> • Care plans • Separate forms • Both 	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1)	
8	Are patient mobility assessments held: <ul style="list-style-type: none"> • With the patient • Separately 	Only give one score Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 1)	

8a	If they are held separately is there a reason?	Yes <input type="checkbox"/> (score = 1)	
9	Do you have appointed manual handling supervisors? <ul style="list-style-type: none"> For all wards and departments For some wards and departments 	Only give one score Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 1)	
10	How is contact maintained with the manual handling supervisors and their competence ensured? <ul style="list-style-type: none"> Formal training sessions Formal staff meetings Informal meetings initiated by BCA Informal meetings initiated by MH supervisor Ad-hoc meetings 	Score 1 for each (max. = 5) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1)	
11	How do the manual handling supervisors maintain contact with the staff and ensure their competence? <ul style="list-style-type: none"> Training records Patient documentation Ward meetings/hand over Personal development plans Problem solving sessions Case conferences Electronic format training/ Training pack/workbook Multi-disciplinary meetings Memos Other 	Score 1 for each (max. = 10) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1)	
	Total		(Max. = 30)

APPENDIX THREE



S.M.Hignett@lboro.ac.uk

Ph: 01509 223003
Fax: 01509 223940

Dr Sue Hignett
Lecturer in Ergonomics
Dept. of Human Sciences
Loughborough University
Loughborough
LE11 3TU

Appendix Three: Consent Form

Title: *Measuring the effectiveness of competency based education and training programmes in changing the manual handling behaviours of health care staff*

Investigators: *Sue Hignett, Emma Crumpton*

Site: *United Bristol Healthcare NHS Trust*

Please cross out
as necessary

Have you read and understood the information sheet? YES/NO

Have you had opportunities to ask questions and discuss the study? YES/NO

Have all your questions been answered satisfactorily? YES/NO

Have you received enough information about this study? YES/NO

Who have you spoken to? Dr/Mr/Ms.....

Do you understand that you are free to withdraw from this study

- At any time? YES/NO
- Without having to give a reason? YES/NO
- Without affecting your employment? YES/NO

Do you agree to take part in the study? YES/NO

Do you understand that the data (including video/audio recordings) will not be available to you after the study? YES/NO

Signature (Participant)..... Date.....

NAME (BLOCK CAPITALS).....

I have explained the study to the above participant and they have indicated their willingness to take part

Signature (Researcher)..... Date.....

NAME (BLOCK CAPITALS).....

Measuring the effectiveness of competency based education and training programmes in changing the manual handling behaviours of health care staff

Invitation to participate

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Purpose of study

This research is looking at compliance with the RCN competency based manual handling training guidance. The aim is to find if compliance leads to a measurable change in the manual handling behaviour of health care staff. We are collecting data from NHS Trusts in the UK. The research will provide information about the possible benefits of adopting this new approach to manual handling training.

Who is doing this research?

This research is being done on behalf of the Health and Safety Executive (HSE) by Loughborough University. The researchers (Sue Hignett and Emma Crumpton) are employed by Loughborough University as Ergonomists in the Department of Human Sciences.

Why have I been chosen?

Because you are a manual handling or back care advisor.

Do I have to take part?

No. Once you have read this information sheet, if you decide to take part you will be asked to sign a consent form. If you decide to take part you can still change your mind later, without giving a reason. You may withdraw at any time.

Sensitive personal data

We will be asking you about your physical well-being as part of a self-screening process to help you to decide whether or not you want to take part.

What will happen to me if I agree to take part?

You will be asked to assist in data collection in your organisation, and will be kept informed of the project results.

What will happen if I decide to withdraw from the project?

There will be no affect on your employment status. The data already collected will be used for analysis unless you specifically request it to be withdrawn and destroyed.

What do I have to do?

Participation will involve recruiting approximately 4 nursing staff, providing a room with your usual manual handling equipment, and acting as a model as the subjects are asked to perform certain tasks. You will

also be asked to complete an organisational checklist which will inform us about the level of compliance of your organisation.

What are the possible advantages/disadvantages of taking part?

This research should produce new evidence about moving and handling competencies that will inform your practice as a manual handling adviser and you will be amongst the first to have this information. The benefit to you is the opportunity to review your manual handling training in the context of the most recent research. There should be no risk to you if you follow your normal working procedures.

What happens if something goes wrong?

We will follow the incident reporting procedure at Loughborough University and your organisation concurrently. If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain about any aspect of the way you have been approached or treated during the course of this project the normal National Health Service (or University) mechanisms may be available to you.

Will my taking part in this study be kept confidential?

If you take part in the research all information collected about you and your organisation during the course of the research will be kept strictly confidential. All references to participants in the report and any subsequent publications/presentations will be anonymous. The information will be kept in a secure location, accessible only to the researchers. All of the data (video-tape, audio-tape, field notes etc.) will remain the property of Loughborough University and will be destroyed 5 years after publication.

What will happen to the results of the research study?

The results will be coded (for anonymity) and analysed by the research team before being reported to the HSE. The results may also be presented in appropriate scientific journals and conferences. If you take part in this research, you can obtain copies of these publications from the research team. The data will be stored by the Chief Investigator (Sue Hignett, Data controller) at Loughborough University under conditions specified by the Departmental Data Protection Advisor.

Who is funding this research?

This research is funded by Health and Safety Executive.

Who do I contact for more information?

You can ask: Emma Crumpton - emmacrumpton@yahoo.co.uk Tel - 07711 095380
or Dr Sue Hignett - S.M.Hignett@lboro.ac.uk, Tel. 01509 223003

What if I have any concerns?

If you have any concerns about this study or the way it has been carried out you should contact the investigators (Emma Crumpton and Sue Hignett) or you may contact Dorothy Brown of the Health and Safety Executive (dorothy.brown@hse.gsi.gov.uk)

Thank you for taking part in this study.

Measuring the effectiveness of competency based education and training programmes in changing the manual handling behaviours of health care staff

Invitation to participate

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Purpose of study

This research is looking at compliance with the RCN competency based manual handling training guidance. The aim is to find if compliance leads to a measurable change in the manual handling behaviour of health care staff. We are collecting data over 2 months in NHS Trusts. The research will provide information about the possible benefits of adopting this new approach to manual handling training.

Why have I been chosen?

Because you are a nurse or health care assistant and you have attended a manual handling course (induction or refresher) in the last 12 months.

Do I have to take part?

No. Once you have read this information sheet, if you decide to take part you will be asked to sign a consent form. If you decide to take part you can still change your mind later, without giving a reason. You may withdraw at any time.

What will happen to me if I agree to take part?

You will be asked to assist in data collection in your organisation, and will be kept informed of the project results.

What do I have to do?

You will be asked to carry out 3 tasks to move a patient (model) from: (1) lying-to-lying; (2) sitting-to-standing; and (3) repositioning back in a chair. You will be asked to work with a colleague and repeat each task three times.

What are the possible advantages/disadvantages of taking part?

This research should produce new evidence about moving and handling competencies that will inform your practice as a nurse and you will be amongst the first to have this information.

What happens if something goes wrong?

We will follow the incident reporting procedure at Loughborough University and your organisation concurrently.

Will my taking part in this study be kept confidential?

If you take part in the research all information collected about you and your organisation during the course of the research will be kept strictly confidential. All references to participants in the report and any subsequent publications/presentations will be anonymous. The information will be kept in a secure location, accessible only to the researchers. All of the data (video-tape, audio-tape, field notes etc.) will remain the property of Loughborough University and will be destroyed 5 years after publication.

What will happen to the results of the research study?

The results will be summarised anonymously before being reported to the HSE. The results may also be presented in appropriate scientific journals and conferences. If you take part in this research, you can obtain copies of these publications from the research team.

Who is funding this research?

This research is funded by Health and Safety Executive.

Who do I contact for more information?

You can ask: Emma Crumpton - emmacrumpton@yahoo.co.uk Tel - 07711095380
or Dr Sue Hignett - S.M.Hignett@lboro.ac.uk, Tel. 01509 223003)

Thank you for taking part in this study.

Pre-selection Medical Questionnaire

Loughborough University

Department of Human Sciences

Please read through this questionnaire, **BUT DO NOT ANSWER ANY OF THE QUESTIONS YET.**

When you have read right through, there may be questions you would prefer not to answer. Assistance will be provided if you require it to discuss any questions on this form. In this case please tick the box labelled 'I WISH TO WITHDRAW' immediately below.

Also tick the box labelled 'I WISH TO WITHDRAW' if there is any other reason for you not to take part.

Tick appropriate box

I wish to withdraw

☐

I am happy to answer the questionnaire

☐

If you are happy to answer the questions below, please proceed. Your answers will be treated in the strictest confidence.

Please delete as
appropriate

- | | |
|---|--------|
| 1. Are you at present recovering from any illness or operation? | YES/NO |
| 2. Are you suffering from, or have you suffered from or received medical treatment for any of the following conditions? | |
| • Heart or circulation condition | YES/NO |
| • High blood pressure | YES/NO |
| • Any orthopaedic problems | YES/NO |
| • Any muscular problems | YES/NO |
| • Asthma or bronchial complaints | YES/NO |
| • Epilepsy | YES/NO |
| • Diabetes | YES/NO |
| 3. Are you currently taking any medication that may affect your participation in the study? | YES/NO |
| 4. Are you recovering from any injury? | YES/NO |

5. Are you allergic to sticking plasters? YES/NO

6. Do you have any other allergies? If YES please give details below YES/NO

7 Are you aware of any other condition or complaint that may be affected by participation in this study? If YES please state below YES/NO

Researcher:.....

Surname:

Department:.....

First Name:

Date of Birth:

Date:.....

Address:

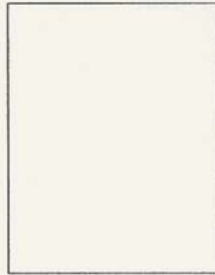
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CONSENT FOR THE PUBLICATION OF MEDICAL PHOTOGRAPHS

Copyright of all images remains with Loughborough University

Consent is given only for use in the publication(s) detailed below; images may not be used for any other purpose.



The photographs shown above this statement have been taken with my permission as part of my participation in the following project. I have also agreed that they may be used for teaching professional staff.

Project title: **Measuring the effectiveness of competency-based education and training programmes in changing the manual handling behaviour of healthcare staff**

Following discussion/correspondence with the researcher (Name..... Dept.....), I understand that it may be helpful for these photographs to be published.

Publication media:

☐ Book

☐ Journal (print and electronic)

☐ Poster

☐ Other

☐ Patient information leaflet

☐ Hospital publication

☐ Electronic

Name of publication Publisher

Electronic publications may be available world wide on the internet. As a result, I understand that the material may be seen by the general public. My name and details will remain confidential but I understand that I might be recognised from the material so **full confidentiality is not guaranteed**.

In view of the explanations given to me by the researcher, I give consent for these pictures to be published in this form only. I have crossed through any pictures that I do not wish to be published and I accept the assurances given that these will not be used.

I understand that no pictures will be submitted for publication within the next 14 days and that during this time, this consent may be withdrawn by writing to the researcher. However should I wish to withdraw consent once photographs have been submitted for publication / published it may not be possible to withdraw them.

Signed:Participant.....

Date:.....

Please complete x2 forms: Copies to (1) Publishers, (2) Principal Investigator (researcher)

Dept of Human Sciences, Loughborough University, Loughborough, Leics. LE11 3TU

APPENDIX FOUR: REVISED QUESTION SET

	Question		Score
1	Was your last external audit within the last 2 years?	<i>Background information only, no score</i>	
2	Have you had an internal manual handling audit within the last 2 years?	Yes <input type="checkbox"/> (score = 1)	
3	Was your last internal manual handling audit : <div style="margin-left: 40px;"> A service provision audit (organisation) An equipment or training audit Local monitoring and supervision None </div>	Only give one score Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 0)	
4	Do you have a general manual handling risk assessment system? Is it: <div style="margin-left: 40px;"> Organisation wide Local level Task Specific No RA system </div>	Only give one score Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 0)	
5	Are completed manual handling risk assessments held: <div style="margin-left: 40px;"> Centrally Locally Both No completed risk assessment </div>	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 2) Yes <input type="checkbox"/> (score = 0)	
6	Are manual handling risk assessment reviewed at least annually? <div style="margin-left: 40px;"> Yes if yes, go to question 6a No </div>	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 0)	
6a	Is the review system: <div style="margin-left: 40px;"> Formal Informal </div>	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 0)	
7	Are patient mobility assessment held in: <div style="margin-left: 40px;"> Care plans Separate forms Both </div>	Only give one score Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1) Yes <input type="checkbox"/> (score = 1)	

8	<p>Are patient mobility assessments held:</p> <p>With the patient</p> <p>Separately, if yes go to question 8a</p>	<p>Only give one score</p> <p>Yes <input type="checkbox"/> (score = 2)</p> <p>Yes <input type="checkbox"/> (score = 1)</p>	
8a	If they are held separately is there a reason?	Yes <input type="checkbox"/> (score = 1)	
9	<p>Do you have appointed manual handling supervisors?</p> <p>For all wards and departments</p> <p>For some wards and departments</p>	<p>Only give one score</p> <p>Yes <input type="checkbox"/> (score = 2)</p> <p>Yes <input type="checkbox"/> (score = 1)</p>	
10	<p>How is contact maintained with the manual handling supervisors and their competence ensured?</p> <p>Formal training sessions</p> <p>Formal staff meetings</p> <p>Informal meetings initiated by BCA</p> <p>Informal meetings initiated by MH supervisor</p> <p>Ad-hoc meetings</p>	<p>Score 1 for each (max. = 5)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p>	
11	<p>How do the manual handling supervisors maintain contact with the staff and ensure their competence?</p> <p>Training records</p> <p>Assessing the quality of patient mobility assessments</p> <p>Entries in patient records/notes</p> <p>Ward meetings/hand over</p> <p>Personal development plans</p> <p>Problem solving sessions /Documented supervision</p> <p>Case conferences/Multi-disciplinary meetings</p> <p>Electronic format training/Training pack/workbook</p> <p>Informal documentation</p> <p>Other (e.g. memos)</p>	<p>Score 1 for each (max. = 10)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p> <p>Yes <input type="checkbox"/> (score = 1)</p>	
	Total		(Max. = 30)

PROPOSED ACTION LEVELS

Score > 50%	No action required. Acceptable compliance with RCN competencies, Staff are likely to be following professional guidelines
40-50%	Request further information about specific weak areas
<40%	Further investigation required.

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