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CLINICAL EVALUATION OF THE PATIENT REPOSITIONING SYSTEMS (PRS) DS-10, DS-10/20 & DS-30

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Background:

Nurses and other healthcare personnel have one of the highest job-related injury rates of any occupation in the United States.^{1, 2} Lateral transfers, turning and patient repositioning constitute activities that present high risk for musculoskeletal injuries of the back, neck and shoulders. A serious challenge, to the healthcare industry, is the rapidly growing aging and bariatric populations in the U.S. and the shortage of nurses and other health care personnel.

Many products attempt to address these patient handling challenges. Such products include ceiling-mounted lifts, floor-based lifts, air-assisted devices and non-mechanical devices such as slide sheets. Healthcare organizations now have a multitude of choices to make when purchasing equipment for transferring, turning and repositioning their patients, residents or clients. However, all these systems typically require more than one person to move the patient.

The Patient Repositioning Systems (PRS) consists of three devices that can be used by a single caregiver, to easily transfer, turn or reposition up in bed, a non-ambulatory or bariatric patient.

A biomechanical evaluation of the PRS was carried out at the VA Patient Safety Center of Inquiry, the results of which determined that it was “reasonable for one caregiver to safely transfer a patient weighing up to 238kg (525 lb)”.³

The PRS DS-10 was also shown to be considerably more time efficient than other lateral transfer devices, when measured in laboratory conditions. It has the advantage of not requiring the patient be placed on a specialized sling, sheet or mattress, as it uses the bedding sheet on which the patient already lays. Thus, the transfer can be made in approximately 33 seconds (not including set up and take down).^{3,4}

Objectives:

The purpose of this clinical evaluation was to analyze the three devices that make up the Patient Repositioning Systems (PRS), with the following objectives:

- Identifying any clinical issues when using the PRS in hospitals, nursing homes, hospital medical-surgical and critical care settings.
- Soliciting clinical feedback from nurses, caregivers and transport team members while using the PRS to perform lateral transfers, turning, rotating and repositioning patients toward the head of the bed.

Components of the Patient Repositioning Systems (PRS)



DS-10 for lateral transfer or patient repositioning



DS-10/20 for turning/rotating patients



DS-30 for repositioning patients to the head of bed

Location and Materials:

Following IRB approval, the evaluation was performed across two hospital sites, the James A. Haley Veterans' Hospital (JAHVA), a VA Nursing Home in Tampa and Tampa General Hospital (TGH), which is one of Florida's seven, Level I Trauma Centers. The evaluations were conducted in five critical care units, two spinal cord injury units, one medical/surgical unit and the VA Nursing Home.

Each clinical unit was provided with two DS-10's and two DS-10/20's to use in the evaluation. Four DS-30's were also provided and attached to specific beds, identified by the nursing staff at the VA nursing home. Several training sessions were conducted for staff, going over safety and operations procedures for each of the three pieces of equipment that compose the PRS. Staff was also given a handout with more information on the PRS, and laminated guidelines were attached to each piece of equipment for easy reference by the user. Information about the evaluation process was provided at the training sessions by a co-investigator.

Statistical Method of Evaluation:

The survey form (Attachment 1) employed a Likert score of 0-10 with 5 indicating no difference from the standard way the task was carried out at present, and greater than 5 indicating that the use of the PRS provided a considerably better approach than the existing procedure methods.

Data Collection:

Data was collected between October 2008 and April 2009. Clinical staff was asked to anonymously complete a survey after using the PRS devices, and then place the results in a box, which was emptied by a co-investigator on a weekly basis. The survey was comprised of 8 questions with space for additional, but optional, comments (See Attachment 1). Collecting data sheets, on a weekly basis, provided the co-investigator with an opportunity to determine how to help facilitate the project's completion, and address any concerns the staff may have.

Results:

A total of 91 surveys were completed, with 25 collected from TGH and 66 from the Tampa VA Hospital spinal cord injury unit & VA Nursing Home.

Summary of Results

(All results presented on scale of 0-10)

Q1-Overall Comfort	Q2-Ease-of-Use	Q3-Stability	Q4-Versatility	Q5-Willing	Q6-Effective	Q7-Efficient	Q8-Safety
Total (91 completed surveys):							
8.32	7.83	8.49	6.95	7.35	8.32	6.68	8.35
James A. Haley Veterans' Hospital							
8.20	7.75	8.58	6.71	7.28	8.12	6.39	8.39
Tampa General Hospital							
8.14	8.04	8.24	7.54	7.52	8.84	7.48	8.24
JAHVA, VA Nursing Home							
9.00	8.59	9.00	8.08	8.13	8.65	8.11	9.17
<i>Scores for individual PRS models</i>							
Model DS-10 -Lateral Transfers							
8.07	7.52	8.41	6.67	6.85	7.92	5.88	8.38
Model DS-20 -Turning to Side							
8.47	7.84	8.29	7.42	7.50	8.66	7.05	8.16
Model DS-30 –Repositioning in bed toward the headboard							
9.00	8.59	9.00	8.08	8.13	8.65	8.11	9.17

- For the PRS DS-10 the average scores for laterally transferring a patient from bed to gurney, gurney to procedure table etc. was 5.88 – 8.41. This demonstrated a considerable improvement over the current methods.
- For the PRS DS-10/20 the average scores for turning the patient side to side ranged from 7.05 - 8.47 and once again, demonstrated a considerable improvement over the current methods.
- For the PRS DS-30 – Repositioning in bed toward the headboard - the average scores ranged from 8.08 – 9.17, demonstrating a considerable improvement over current assisted and un-assisted methods.

Discussion of the Findings:

1. The safety and the stability of the PRS earned high scores for all three devices ranging from 8.16 to 9.25. This is an essential requirement for any device used to transfer, turn or reposition patients. Any user uncertainty about equipment safety, could be perceived by the patient, or may influence the user to revert to manual lifting.

2. Participants who evaluated the equipment generally felt that it was effective. The average scores for all three devices ranged from 7.92 for lateral transfers, 9.17 for turning and 8.08 for repositioning patients to the head of the bed.

Comments included:

“Does what it is supposed to do; it laterally transfers, turns them, (patients) on their side and lifts the patient up the bed.”

Some evaluators, who were more familiar with very high tech, safe patient handling equipment and were therefore, somewhat resistant to using the mechanical PRS, were asked to evaluate these devices as though they worked in a unit without any, or very little, safe patient handling equipment. Their evaluations were very positive.

3. The length of time (efficiency) .that the task took to complete was frequently commented on, and is perceived as a potential barrier to using the PRS. This question presented the lowest scores across both sites. This result is to be expected when there is any new change to process within an organization as with all safe patient handling equipment.

A key point was made by many respondents that “It (PRS) will increase productivity because we won’t need to wait for help in turning the patient”.

There is undoubtedly much time spent, waiting for colleagues when requiring help to re-position, turn or laterally transfer a patient and it would be interesting to study the time it takes to access and then to use the PRS as opposed to waiting for colleagues to gather, in order to assist with the task.

4. The frequency of use appears to encourage staff to write/voice comments such as: “works great!”; “excellent to transfer from bed to stretcher, however in tight spaces, we have to move the bed to get this equipment to the other side of the bed”; “very convenient for one person to transfer a patient”; “is safe and practical for one person as long as we have time to do so”

5. Ease of use, the average score for all three tasks was 7.83.

In fact, staff frequently stated how surprised they were by how easily they could turn the handle, and that they did not feel the weight of the patient while doing so.

6. Versatility of use.

The Patient Repositioning System was strictly used according to the approved protocol: for lateral transfer, rotation and moving a patient towards the head board only.

Thus PRS was not used in rehabilitation or other specialized departments such as Radiology, OR, OB, Neurology, Oncology etc. where applications for PRS may also be appropriate.

7. The main concern among staff was that the straps should be “body fluid resistant” or “threaded tightly”. Extra straps can be easily obtained and staff was shown how to change them when they became contaminated or were used with a patient infected with C-Diff, MRSA etc.
8. There were many informal comments that PRS would present considerable benefit in Long Term Care and Home Health Care, due to its use by a single caregiver, its compact size, mobility and ease of use.

Study Limitations:

The informed consent form was very long and some nurses were reluctant to sign it. Some nurses were also excluded by the initial criteria. Following IRB approval a shorter form was used that increased participation.

One of the sites included in the evaluation, was also implementing several other devices. This sometimes caused confusion among staff, with the training for the purchased equipment taking precedence.

Due to the Christmas and New Year holidays and the high census in the winter, data collection slowed.

The Spinal Cord Injury units were equipped with state of the art patient lifting equipment and expressed reluctance to use something that they were not used to or felt they needed.

There was a hospital-wide policy implemented during the latter stages of the study that directed that air assisted devices had to be used for lateral transfers of patients going to any department for investigation.

Several areas in the JAHVA use stretch fitted sheets. This resulted in the need to change these for a cotton based sheet (flat or fitted), thus resulting in the need for two people to assist with the repositioning/turning/transfer task and an increase in the time it took to perform the activity.

Implications for Practice (Conclusion):

- Based on biomechanical evaluation, the Patient Repositioning Systems can be operated by a single caregiver, who could easily and safely reposition, transfer or rotate a non-ambulatory patient weighing up to 238 kg (525 lb).³
- Clinical trial of the PRS was conducted in 2008-2009 for a period of over six (6) months at the James A. Haley Veterans' Hospital (JAHVA), Tampa General Hospital (TGH) and VA Nursing Home.
- The high average scores demonstrate a considerable improvement over all other methods which require more than one care giver to accomplish the same procedures.
- At the VA Nursing Home, results show high acceptance of the PRS and specifically PRS model DS-30 for repositioning patients toward the head of the bed, which is otherwise a high-risk nursing task.
- At Tampa General Hospital, all patient transfer and repositioning tasks are assigned to lift teams. The high scores at this site are the result of several factors:
 - Through repeated use, the Lift Teams developed an experienced understanding of the various functions of the PRS and could use the device in an efficient manner.
 - The Lift Teams successfully used PRS in Critical Care Units (ICU, CCU, MICU and CSU) and surgical departments, where sophisticated patient transfers are required.
 - Use of PRS by trained healthcare workers or transfer teams, specially-dedicated to patient handling in hospitals, nursing homes and long term care facilities, can relieve nurses from patient handling tasks.
- Patient Repositioning Systems (PRS) is the system for transfer, repositioning and rotating normal and bariatric patients by a single caregiver.
- Utilizing the flat sheet on which a patient normally lays, the patient can be turned, repositioned or laterally transferred with minimum interference and discomfort, requiring little effort by the caregiver.

- PRS is a solution for one of the most significant challenges in nursing and long term care units, locating a colleague who is available to help with transferring, turning or repositioning a partially or totally immobile or bariatric patient.
- These tasks become an even greater challenge in home healthcare settings, where many caregivers work independently.
- The PRS was found to be safe, stable, easy and effective to use by a single care-giver for repositioning, transferring and turning operations, thereby improving efficiency, productivity and significantly reducing the possibility of injury to care-giver and their patients.
- Data collected at the VA and TG Hospitals; and the VA Nursing Home demonstrates that PRS can be successfully used by both medical personnel and trained caregivers without a medical background, and perform tasks for safe patient handling in hospitals, nursing homes, long term facilities and home healthcare.

References:

1. U.S. Department of labor, Occupational Safety and Health Administration. (1999). Ergonomics program; Proposed rule. Fed. Reg., November 23.
2. U.S. Department of labor, Occupational Safety and Health Administration. (2000). 29 CFR Part 1910. Ergonomics program. Final rule. Fed.Reg., November 14.
3. Lloyd J, Shultz B, Applegarth S, and Baptiste A. (2006) Biomechanical Evaluation of Patient Repositioning System (PRS DS-10). VA Patient safety Center of Inquiry. Tampa, FL.
4. Lloyd JD & Baptiste A. (2006) Biomechanical evaluation of friction reducing devices for lateral patient transfers. AAOHN Journal. 54 (3): 113-119

Attachment 1 – Survey Form

Product I.D: _____	Task: <input type="checkbox"/> Reposition up in bed <input type="checkbox"/> Lateral transfers <input type="checkbox"/> Turning a pt. to side	Facility: _____ Unit: _____
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Please compare your impression of the new product to the standard method for completing these tasks. Answer each of the following questions on a scale from -5 to +5, by circling the number that matches your impression, where minus five (-5) indicates considerably worse than standard task, zero (0) indicates no difference from standard task; and plus five (+5) indicates considerably better than standard task.

We encourage you to express any comments you might have directly on this form and thank you for taking the time to help us make the right purchasing decisions for your facility.

1. How would you rate your OVERALL COMFORT during use of this product?

-5 -4 -3 -2 -1 0 1 2 3 4 5

V. Uncomfortable

V. Comfortable

2. What is your impression of this product's OVERALL EASE-OF-USE?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Very Difficult

Very Easy

3. How STABLE do you think the product is during use?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Very Unstable

Very Stable

4. How VERSATILE do you think this product is for patient transfers?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Not Versatile

Very Versatile

5. How WILLING are you to use this product on a day to day basis?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Not Willing

Very Willing

6. How EFFECTIVE do you think this product will be in reducing CAREGIVER INJURIES?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Totally Ineffective

V. Effective

7. How EFFICIENT do you feel this product will be in use of your TIME?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Totally Inefficient

V. Efficient

8. How SAFE do you feel this product would be for the PATIENT?

-5 -4 -3 -2 -1 0 1 2 3 4 5

Very Unsafe

V. Safe

9. Make sure you checked box indicating what task you are doing-see top of questionnaire and check box (lateral transfer, reposition up in bed or turn patient to the side)

Additional Comments:

Thank you for participating in this evaluation

