

# Cost Justification

## AN ERGONOMIC EVALUATION OF PATIENT TRANSFER SYSTEMS: BED TO STRETCHER

From: An Ergonomic Evaluation of Patient Transfer Techniques: Bed to Stretcher. Brigham, Colin J., Galson Consulting, 800-220-7288. Presented at the American Industrial Hygiene Association Conference & Exposition, May 21, 1991.

### **INTRODUCTION**

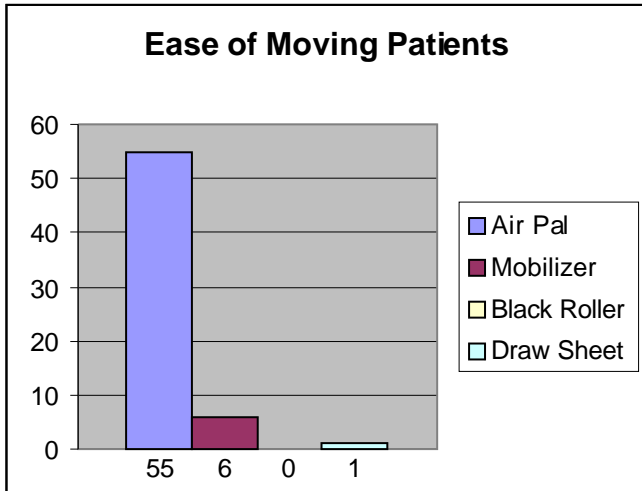
Data indicates that nurses lose three quarters of a million working days a year as a result of back injuries with costs ranging between \$5,000.00 and \$100,000.00 for each case. 38-46% of all back pain episodes and roughly 73-81% of all their compensable back injuries are attributed to patient handling, according to this same study. A 1987 report indicated that 61% of all back injuries in nursing are a direct result of patient handling. The purpose of this study was to evaluate patient transfer techniques for the tasks of moving patients from bed to stretcher, stretcher to bed, stretcher to table, and table to stretcher. These transfers constitute the majority of the transfers where the patient starts and finishes in a horizontal position. This is one of the types of patient transfer tasks that results in the highest incidence rate for back injuries to the nursing staff in hospitals, along with resulting high costs. A 1989 study evaluated four patient transfer systems that may be used to achieve these types of transfers, using a panel of nurses and engineers to evaluate the convenience and utility of each of the transfer devices. It was the intent of this study to conduct subjective response surveys of nursing staffs at two hospitals regarding the patient transfer devices to which they were exposed.

### **QUESTIONNAIRE FORMAT**

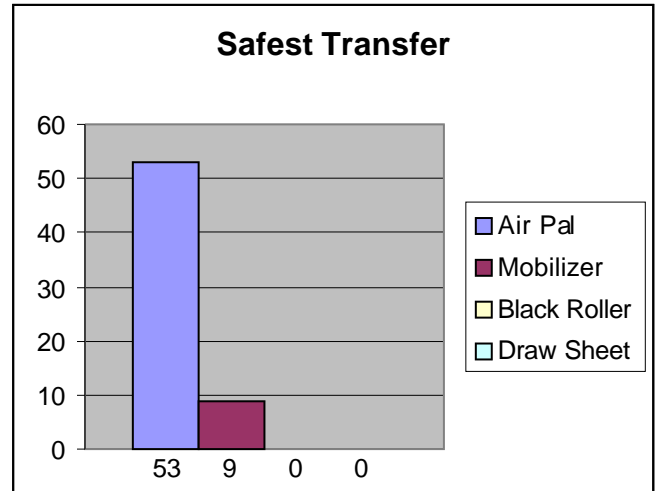
Questionnaires were developed for two hospitals, being distributed to the nursing staff and ancillary staff at each hospital. Since the systems used at the two hospitals varied, the structure of the survey varied slightly. The devices used at hospital "A" included the AIR PAL™, the Chick Patient Roller, the Medical Laboratory Automation Mobilizer, and Draw Sheets. The AIR PAL™ is essentially an air mattress with approximately 4,000 holes in the bottom to lift the mattress and patient off the bed. Two nylon webbing handles are provided on each side. A high volume, low pressure blower serves as the air supply. The mattress is radiolucent. The Chick Patient Roller consists of stainless steel and aluminum rollers covered with conductive vinyl. In the hospital "A" graphs it is identified as "Black Roller." The Mobilizer is a device that shuttles a transfer surface beneath the patient then shuttles the patient onto the Mobilizer. It is a wheeled device that also serves as a stretcher. The N.O.A. Glider consists of two unconnected, low friction, low static polypropylene mats. They have built in handles and velcro straps to secure the patient. The respondents were asked to identify the date of completion of the survey, their nursing unit, their job title, but not their name. Hospital "A" had a total of 80 respondents. Hospital "B" had a total of 52 respondents.

# Hospital "A" Results

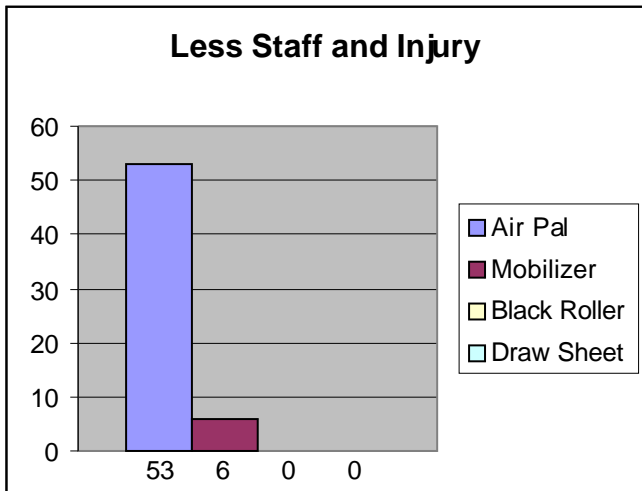
The respondents were asked to rate each device on a scale of 1 to 4, with 1 the lowest and 4 the highest rating, for a number of different factors.



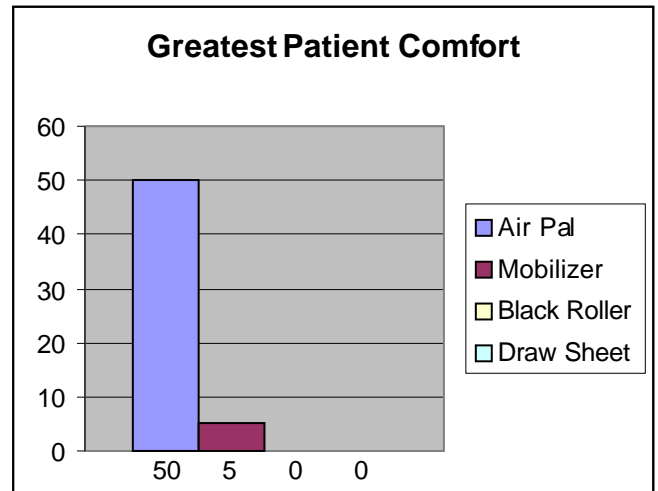
The first was ease of moving patients. As this slide shows, 55 of the respondents gave the highest rating, 6 the Mobilizer, and 1 the Draw Sheet. No one rated the Black Roller the highest in terms of ease of moving patients.



The second evaluation was for the safest transfer. 53 respondents rated the AIR PAL highest, 9 the Mobilizer highest, and none the Black Roller or Draw Sheet highest.



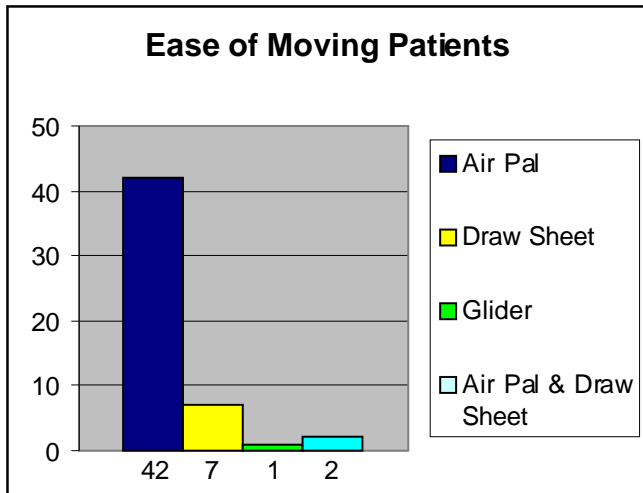
The third evaluation was for less staff trauma and injury. 53 respondents rated the AIRPAL highest, 6 the mobilizer highest, and none the Black Roller or Draw Sheet highest.



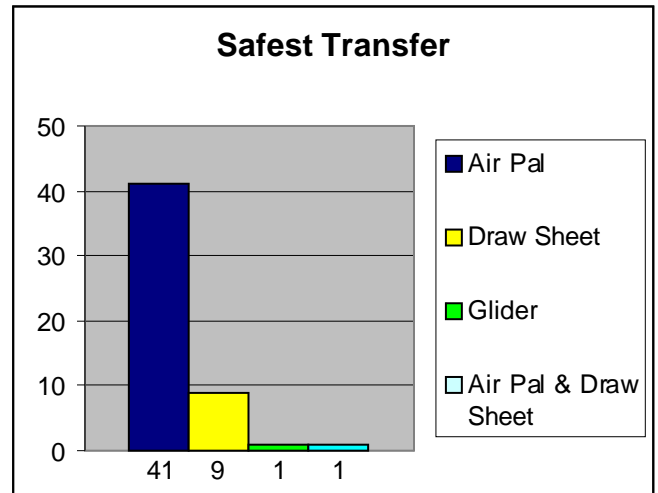
The fourth evaluation was for greatest patient comfort. 50 rated the AIR PAL highest, 5 the Mobilizer highest, and none the Black Roller or Draw Sheet highest.

The last evaluation was for availability on their unit. If systems (devices) are not readily available, then the ability to fairly evaluate that device is reduced. The need to wait to use a device may also negatively impact upon evaluation. The devices with the lowest rating for availability were Black Roller (17 responses) and Mobilizer (8 responses). Neither of these devices were used throughout the facility. An additional question that was asked was whether the respondent had ever been injured during a transferring process. 19 respondents (25%) said "yes", 58 (75%) said "no".

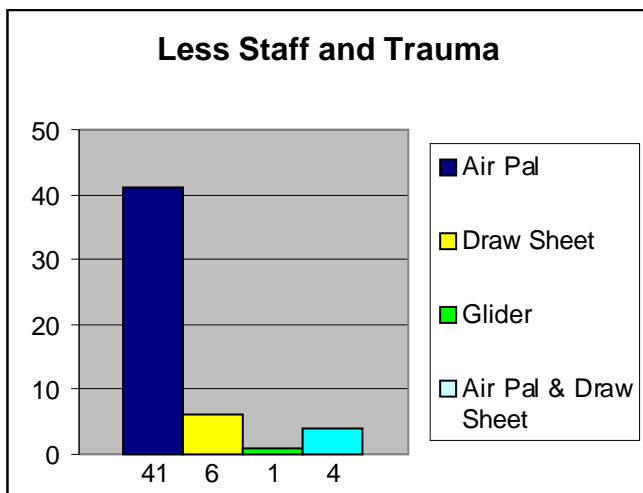
# Hospital "B" Results



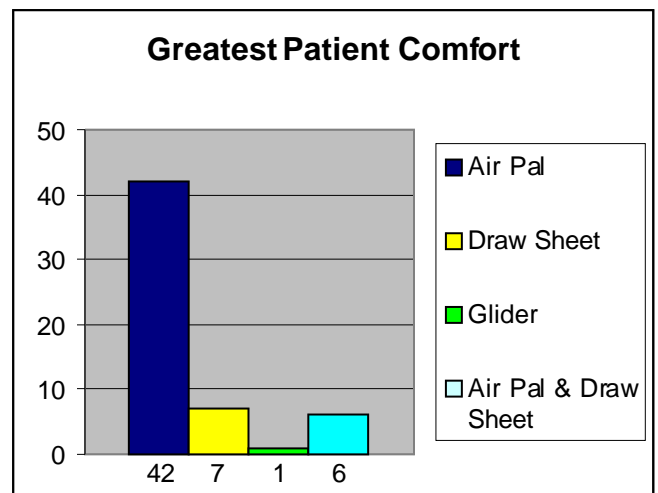
The first evaluation at hospital "B" was for ease of moving patients. 42 respondents rated the AIR PAL® highest, 7 the Draw Sheet highest, 2 gave an equal rating to the AIR PAL® and the Draw Sheet, and 1 rated the Glider the highest. It should be noted that the highest rating with the Draw Sheet response was when a red plastic pull sheet was used in conjunction with the regular Draw Sheet. This pull sheet was a home made device, being a red hazardous waste bag that was slit.



The second evaluation was for safest transfer. 41 rated the AIR PAL® highest, 9 the Draw Sheet highest, 1 the Glider highest, and 1 said the AIR PAL® and Draw Sheet were equal.



The third evaluation was for greatest patient comfort. 41 rated the AIR PAL® highest, 6 the Draw Sheet highest, 4 evaluated them as equal, and one rated the Glider highest.



The fourth evaluation was for less staff trauma and injury. 42 rated the AIR PAL® highest, 7 the Draw Sheet highest, 6 evaluated them as equal, and 1 rated the Glider highest.

The last evaluation was for availability on their unit. The Glider and home made red plastic pull sheet were the devices with the least wide spread use and availability 15 of the 52 respondents (29%) stated that they had been injured during a transferring process. Two specific questions were also asked regarding the time required to conduct transfers and the number of people. The responses from all respondents were averaged. The results are as follows: 1) The time required to move patient without AIR PAL® averages out to 4.0 minutes, with AIR PAL® 2.9 minutes. 2) The number of people required to move patients with AIR PAL® averages out to 3.5, with AIR PAL® 2.1.