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Improvements on Fall Risk Assessment to Promote Patient and Employee Safety

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Abstract

Cohort 22 of the University of San Francisco's MSN, Clinical Nurse Leader (CNL) program conducted a study focusing on the implementation of the Hendrich II Fall Risk Model and the Patient Mobility Assessment Tool (PMAT) at an urban California Bay Area hospital. Assessments were performed on 74 patients (n = 74) between January 2018 and April 2018. Cohort 22 determined that the Hendrich II test with introductions took an average of 01:49 minutes to conduct. It was also determined that it took and average of 03:12 minutes to conduct the PMAT. 88.19% (66/74) patients correctly estimated their level of mobility. This indicates that nurses can adequately trust a patient's judgement, but still should conduct mobility assessments to minimize injury to patients and staff. Lastly, educational videos were created for the purpose of training new nurses and retraining currently-employed nurses. These findings were presented to the facility's falls committee.

Introduction

Patient falls have become a major physical, psychological, and monetary issue in all hospitals throughout the United States. There are multiple tools that health professionals can utilize in order to determine a patient's fall risk and mobility level. For the purpose of this study, we will focus on the Hendrich II Fall Risk Model and the Patient Mobility Assessment Tool (PMAT). The University of San Francisco's Master of Nursing, Clinical Nurse Leader Cohort 21 determined that according to their review of current literature, the Hendrich II model was appropriate to use. The purpose of Cohort 22's study was to calculate the average time to complete both the Hendrich II and PMAT assessments, determine if we could trust our patient's judgment of their own mobility, and create educational material for the nursing staff to use as

training for new graduate nurses and retraining for currently-employed nurses. The particular aspects of each test will be discussed at length in the Methods portion of this paper.

The nursing profession needs a clearer understanding of patient mobility in order to decrease the number of injuries that happen to both patients and employees. Individuals can display weakness in a number of different ways (e.g. upper body, lower body, medication-induced weakness, lack of medication education, etc.). A PMAT score of 5, the highest possible score, does not indicate zero chance of falling. Even with this knowledge, healthcare professionals must conduct mobility assessments in order to limit these falls. Traditionally, nurses have not performed these tests. This task was generally assigned to Physical Therapists (PTs). As a result, patients can become injured through communication error (Boynton, Kelly, and Perez, 2014). It is imperative that nurses be on the front line of conducting patient mobility assessment due to their continual surveillance of patients. Having a stronger understanding of Hendrich II and PMAT will help nurses better determine which patients are at higher risk for falls and subsequent injury.

In order to determine if we can trust the patient's' own understanding of mobility, it is first important to define a few key phrases. The World Health Organization (WHO) defines a fall as, "an event which results in a person coming to rest inadvertently on the ground or floor or other lower level." A fall-related injury can either be non-fatal or fatal. Most falls that occur in hospital are non-fatal (Falls, 2018). The cause of a fall can be due to the patient (e.g., dizziness) or environmental (e.g., slippery floor). An assisted fall is defined as a fall that is interrupted by a nurse or other staff member. According to the National Database of Nursing Quality Indicators (NDNQI), there are four different types of falls:

> (1) Minor, in which a dressing, ice, or topical medication was applied, or the limb was elevated, or a wound was cleaned; (2) moderate, in which suture, steri-strips, skin glue, or splint was used; (3) major, in which the patient required surgery, casting, traction, or a neurological consult; and (4) death, in which the patient died as a result of injuries caused by the fall (Bouldin et. al, 2014).

Falls are the most common cause of non-fatal injuries for individuals over the age of 65. The average cost of each fall is $30,000 (CDC, 2017). Medical costs for falls totalled more that $50 billion in 2015 (CDC, 2016). Falls in US hospitals range from 3.3 to 11.5 falls per 1,000 patient days (Bouldin et. al, 2014). Around 32% of individuals over the age of 65 fall each year, with men more likely to fall than women. Around 25% of falls result in injury, and 2% of these falls result in fractured bones. Per year, there are 41 deaths due to falls per 100,000 individuals (Currie, 2008).

The impact of patient falls is not limited to personal injury. The fear of falling can cause unwanted psychological damage to a patient. If the patient is unwilling to ambulate for fear of falling, this can cause further complications. Patients who lack mobility and are on strict bed rest are capable of losing 2-5% of their strength each day. As these days pass, these patients are more likely to fall from their beds and injure themselves, the staff, or both (Latvala & Masterman, 2017).

Another key attribute of patient falls is injury caused to staff members. This is a major issue in the nursing field. According to the Occupational Safety and Health Administration (OSHA), the basic definition of a staff injury is, “an injury or illness to be work-related if an event or exposure in the work environment either caused or contributed to the resulting condition

or significantly aggravated a pre-existing injury or illness" (United States Department of Labor, 2018). Nursing injuries, particularly to the back, cost $16 billion annually in workers compensation benefits. Hospitals have the highest incidence of work-related injuries of all occupations. These injuries can be career-ending. Vendittelli et al. (2016) state that between 12-18% of nurses leave the profession each year due to back pain. Nurses sustain musculoskeletal injuries and disorders at twice the national rate of other professions. The impact of these injuries are not only felt by the individual nurses but their facilities as well. Healthcare-related injuries are three times the number of any other industry (White, 2010). According to surveys by the Department of Labor's Bureau of Labor Statistics (BLS), there are more than 35,000 back and other injuries among nursing employees every year, severe enough that they miss work. Nursing assistants and orderlies each suffer roughly three times the rate of back and other musculoskeletal injuries as construction workers (Zwerdling, 2015). Limiting work-related injuries will help to improve workers compensation costs, decrease nursing injuries, and improve staff morale.

Most hospitals are now focusing on safe patient handling and mobility (SPHM) training in order to reduce the number of staff injuries. SPHM tasks include, "any physical activity, technique, maneuver that requires nurses to assist with lifting, transferring, or moving patients" (Vendittelli et al., 2016). In 2014, a hospital in Rochester, New York, implemented a project to change mobility culture amongst nursing staff in order to decrease the usage of manual lifting. The nurses were trained to use a mobility assessment tool and lift equipment. This particular program revealed that these tools helped to limit staff injury, increase patient ambulation, and

decrease the number of patients on strict bed rest (Latvala & Masterman, 2017). We hope future cohorts will be able to replicate these findings.

Methods

Data was gathered over the course of five separate days. 35 total hours were spent on testing patients. The units involved for this test included; Surgical/Pediatrics with 48 patients; Medical with 15 patients; Telemetry with 9 patients; and Medical/Surgical Oncology with 2 patients. The total number of patients tested in this study equaled 74.

Upon entering the hospital, we first needed to talk to the charge nurse to determine if it was acceptable to perform the tests on a particular floor. If they said yes, we then asked each nurse if our presence was acceptable. Once everyone was aware of our activity, we started with patients who were likely to be discharged. These patients tended to be quite helpful due to the fact that they were leaving the facility shortly. Before discussing what occurred in each room, it is first important to better define both the Hendrich II model and PMAT.

The Hendrich II Fall Risk Model is a guide to help health professionals determine the risk of a patient falling from bed. There are a number of criteria that the model includes. The patient is assigned risk points if a particular risk factor is present. The risk factors are as follows: (1) confusion/disorientation/impulsivity; (2) depression; (3) altered elimination; (4) dizziness/vertigo; (5) gender (male); (6) antiepileptics given in past 24 hours; (7) benzodiazepines given in past 24 hrs; and (8) gait and mobility test. If the patient scores higher than 5, they are considered a high risk for falls.

The PMAT helps healthcare professionals determine the mobility level of a particular patient. Used in conjunction with the Hendrich II, the PMAT determines if passive lifts,

mechanical sit-to-stand lifts, non-mechanical sit-to-stand lifts, or assistive devices are necessary for the patient to mobilize. There are five steps: (1) sit and shake; (2) stretch and point both feet; (3) stand; (4) march and step in place for five seconds; and (5) walk at least 150 feet. Each level corresponds to a particular assistive device. If the patient cannot complete step one, they require passive lifts. If the patient completes step five, they can ambulate without the need for an assistive device.

Upon entering each room, the team would ask the patient if they were willing to participate in the study. Sometimes, patients would be either too tired or in too much pain to participate. If the patient agreed, the team began with the Hendrich II model to determine if they were a fall risk. We first asked if they believed they would be able to get out of bed without the use of an assistive device. The team would also ask if they would be able to push up out of bed successfully in one attempt, or if it would take multiple attempts. It was also important to ask the patient if any of the medications they have taken while in the facility have caused any constipation or urinary retention. These conditions can lead to a possible fall.

Once the Hendrich II test was completed, we would begin the PMAT. A total of four individuals helped to perform the PMAT; one lead nurse, an assistant nurse, a time keeper, and the Physical Therapist to ensure proper patient safety. The time keeper was an integral part of the team because they documented how long each particular aspect of the test took. They would also determine the type of equipment in use, such as IV, urinary catheter, oxygen cannula, etc. Before exiting the bed, we would place a gait belt around the individual for better patient handling. Once sitting up in bed, we would ask the patient if they felt any dizziness. If not, we would proceed through each of the steps. If the patient stated that they needed a walker to ambulate, we would

not perform the final step of ambulating 150 feet. Upon finishing both tests, the team would meet at the nurses station and discuss our thoughts on the findings. Once in agreement on patient scores, we audited our own findings with the findings of the nurse assigned to that particular patient. This process was followed for all patients tested.

Results

The most common diagnoses for this study were small bowel obstruction and pneumonia. The following table is a breakdown of all 74 patients and their diagnoses:

Diagnosis Type	Number of Patients	Diagnosis Type	Number of Patients
Gastrointestinal	24	Oncology	3
Orthopedic	18	Renal	2
Respiratory	11	Cardiac	2
Neurological	4	Endocrine	1
Integumentary	3	Other	6

It is important to note that for the category “Other”, these patients had a multitude of diagnosis. Thus, it was impossible for us to narrow their diagnosis down to one in particular. The overall average number of devices attached to patients over all four units was 1.04. The following table illustrates the average time to complete the Hendrich II assessment over each unit:

Unit	Average time for Hendrich II Assessment Alone	Average Time for Hendrich II Assessment Plus Introductions
Surgical/Pediatrics	0:01:15	0:02:07

Medical/Surgical Oncology	0:00:45	0:0053
Telemetry	0:02:03	0:02:14
Medical	0:00:26	0:00:46
Overall	**0:01:10**	**0:01:49**

The average time for PMAT assessment was 0:03:12 over all four units. Broken down further, the average time for PMAT assessment levels 1-4 was 0:02:14. These were 62% of the overall number of patients tested. For patients at level 5 (38% of population), the average time with introductions was 0:03:12. The following table will help break down how long each step of the PMAT took to complete for all patients (n = 74):

PMAT Assessment Tests	Average Time
Test Started	0:00:39
Patient to Edge of Bed	0:00:25
Sit and Shake	0:00:16
Point and Stretch	0:00:17
Stand	0:00:25
March and Step	0:00:20
Walk 150 ft.	0:01:24
Back in Bed	0:00:26
Total	**0:03:12**

Concerning the patients' impressions of their mobility, 66 out of 74 of the patients correctly guessed their mobility level. This is an 89.19% success rate. Two patients

overestimated their ability, three underestimated, and three patients gave no prediction. For those who were unable to predict correctly, 6 out of the 8 were over the age of 80. The average patient age for those who participated was 72.

Implementation

One of the most important aspects of this study was to create educational materials to use as future tools for new nurses and for annual retraining of employees. The team decided to make educational videos in order to demonstrate how to safely and correctly perform the Hendrich II assessment. These videos also highlight how quickly the assessment can be performed.

Video one contained a scenario where the patient was confused about the date due to a concussion sustained from a fall outside of the facility. The nurse performed a Hendrich II assessment, but was unable to get the patient to stand due to dizziness. The patient was then safely led back to the bed and fall precautions were initiated. The follow-up video to this scenario contained a scene where a nurse and two assisting nurses discussed the Hendrich II score for that particular patient. The second scenario consisted of a nurse and two assistants attempting to perform a Hendrich II assessment on an impulsive patient. The patient was not confused, and was correctly oriented to person, place, and time. Upon standing, the patient lost balance and needed to be guided back to the bed. The follow-up video to this scenario contained another scene where the lead nurse and two assisting nurses discussed the Hendrich II fall risk number for that particular patient. The final video concerned patient partnering. The nurse asked the patient what they would do if they needed to use the restroom, and if they were worried if they would fall while getting out of bed. This video helps to illustrate that a very quick conversation can help to establish a partnership between patient and nurse to help prevent patient

falls while ambulating. The final implementation for this study consisted of a presentation of our findings to the facility's fall prevention team. All student nurses involved in the study created a powerpoint presentation that highlighted our key findings. The presentation concluded with a question and answer session between students and the fall committee.

Cost Analysis

Our goal as Cohort 22 was to determine how long it takes to perform the Hendrich II and PMAT assessments, create educational material for training, and determining if we can trust our patients' judgement regarding their mobility. Determining the cost of these measures was not factored into our goals. Regardless, the information presented to the falls committee will likely help to reduce the number of falls that occur at that facility. The falls committee did not present to the students the facility's fall rate, so the rate of 3.3 to 11.5 falls per 1,000 patient days is assumed (Bouldin et. al, 2014). Taken with the average cost of a fall of $30,000, hospitals can save between $99,000 and $345,000 per 1,000 patient days. Since the issue of falls costs US hospitals roughly $50 billion per year, implementing Hendrich II and PMAT assessments could be a meaningful investment.

Evaluation

Our cohort was responsible for collecting and interpreting the data, and discussing the findings with the falls committee of the hospital. The educational videos created for training new nurses was received well by the falls committee. Overall, there was no evaluation of the intervention because our cohort did not implement a change on a floor. If an intervention were to

be implemented, the most important data would concern the number of nurses who comply with the Hendrich II and PMAT assessments. Another point of interest would be the time it takes for nurses to conduct both assessments. Lastly, we would want to determine if our findings concerning the number of patients who correctly guessed their own level of mobility matched those of future nurses.

Discussion

The most remarkable finding from this study was the number of patients who correctly guessed their level of mobility (89.19%). When our cohort began this study, nobody believed the number would be even close to 50%. Patients who were rated upon first glance a score of 1 on PMAT would surprise the team by actually scoring as a 4 or 5. This information indicates that nurses cannot predict mobility by just looking at a patient. A nurse's clinical expertise can be deceptive with mobility predictions, which is contra-intuitive to the nursing practice. This study illustrates the importance of physically performing mobility assessment in order to properly determine a patient's fall risk.

Another interesting aspect of this study was the actual time it took to perform both Hendrich II and PMAT assessments. In "nursing" time, one believes these assessments take approximately 20 minutes in length. In reality, the total Hendrich II time was 01:10 minutes and PMAT (including Hendrich II) was 03:12 minutes. This finding indicates that Hendrich II and PMAT assessment tools can be implemented on a hospital floor without much employee backlash due to its relatively small timeframe.

One feature that needed to be changed during the study was our sheet with equipment in use, time tables for tests, and patient's own thoughts on level of mobility. After our first day of

testing, we determined that we did not have enough slots for all these variables we wanted to track over the course of the study. Thus, the data collected from these patients was discarded and we started over the next week. It is unfortunate that this occurred, but our sample size of 74 is ample enough to be valid.

Future Directions

In order to continue the study, Cohort 23 ought to educate the nursing units of our cohort's findings. If the falls committee permits, the students should aid in educating nurses on how to conduct Hendrich II and PMAT assessments. Students can continue timing on units with more diverse patients populations as well. Our cohort did not have the opportunity to test enough patients with dementia (n=2), so it would be wise for Cohort 23 to include more of these patients. This will help to broaden the scope of the study. Students should work with the IT department to input criteria specifications into the far right reference column on the EHR to aid in nurse assessments. With more visibility, it is possible that nurses will be more inclined to perform the assessments. Students should also collaborate with IT and Pharmacy in order to auto-populate the score for medications (antiepileptics and benzodiazepines) administered within the previous 24 hours. Additionally, students should pair with one nurse and time that nurse to determine if there is a discrepancy between student and nurse timing.

In sum, Cohort 22 determined that 88.19% (66/74) of patients correctly estimated their mobility level. This indicates that nurses cannot predict mobility just by looking at a patient, as they might underestimate a patient's ability. Hendrich II and PMAT can be used to adequately rate a patient's fall risk and mobility level. The Hendrich II test, with introductions, took an average of 01:49 minutes to conduct. The PMAT was determined to take 03:12 minutes to

conduct (including Hendrich II). Educational videos were created by students for the purposes of retraining nurses and educating newly hired nurses. These assessment tools are incredibly valuable for both nurses and hospitals alike. Limiting the number of falls is paramount to lowering the cost of healthcare in the United States. As a $50 billion a year issue, fall risk assessment needs to be carried out by well-trained nurses. These assessments will help to save money, limit the number of patient and nursing injuries, and improve overall hospital scores.

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