

2015

Development of an Education Program for Nursing Staff Related to Obtaining Standardized and Accurate Daily Weights

Jessica L. Prew
Rhode Island College

Follow this and additional works at: <https://digitalcommons.ric.edu/etd>

 Part of the [Nursing Commons](#)

Recommended Citation

Prew, Jessica L., "Development of an Education Program for Nursing Staff Related to Obtaining Standardized and Accurate Daily Weights" (2015). *Master's Theses, Dissertations, Graduate Research and Major Papers Overview*. 124.
<https://digitalcommons.ric.edu/etd/124>

This Major Paper is brought to you for free and open access by the Master's Theses, Dissertations, Graduate Research and Major Papers at Digital Commons @ RIC. It has been accepted for inclusion in Master's Theses, Dissertations, Graduate Research and Major Papers Overview by an authorized administrator of Digital Commons @ RIC. For more information, please contact kayton@ric.edu.

DEVELOPMENT OF AN EDUCATION PROGRAM FOR NURSING STAFF
RELATED TO OBTAINING STANDARDIZED AND ACCURATE DAILY
WEIGHTS

A Major Paper Presented

By

Jessica L. Prew

Approved:

Committee Chairperson	_____	_____
		(Date)
Committee Members	_____	_____
		(Date)
	_____	_____
		(Date)
Director of Master's Program	_____	_____
		(Date)
Dean, School of Nursing	_____	_____
		(Date)

DEVELOPMENT OF AN EDUCATION PROGRAM FOR NURSING STAFF
RELATED TO OBTAINING STANDARDIZED AND ACCURATE DAILY
WEIGHTS

by

Jessica L Prew

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

In the School of Nursing

Rhode Island College

2015

Abstract

Obtaining daily weights is an integrated process in daily nursing practice and considered useful data in treatment options. Literature reviewed revealed evidence based knowledge that daily weights are routinely used in everyday practice. However this data obtained is not always reliable and the task is not performed based on a standardized practice. The purpose of this education program was to educate nursing staff regarding procedures to obtain accurate daily weights. The program development used a pre-survey, intervention and post-survey design. The educational program for nursing staff served as the intervention. The sample included nursing staff employed on 4 East, a 30-bed medical surgical unit at the Miriam Hospital. This unit has a cardiac and vascular focus and also 24 telemetry beds available. Results revealed that nursing staff was aware of the daily weight policy, CNAs were simply obtaining the daily weights as a delegated task, and that nursing staff were unsure as to what to do if the equipment malfunctioned. Basic nursing educational programs should further stress the importance of daily weights as well as the reasoning for ensuring accuracy. Recommendations would include education of nursing staff that is geared toward evidence-based approaches to obtain an accurate daily weight. Further research is needed to understand the barriers to obtaining accurate daily weights and the effects on patient outcomes

Table of Contents

Statement of the Problem	1
Literature Review	2
Theoretical Framework	13
Methodology	14
Results	19
Summary and Conclusions	22
Recommendations and Implications for Advanced Practice Nursing.....	25
References	28
Appendices	30

Development of an Education Program for Nursing Staff
Related to Obtaining Standardized and Accurate Daily Weights

Statement of the Problem

Weight is an important factor in hospital clinical decision-making and can significantly impact clinical interventions related to medication dosage, assessment of fluid volume deficits or overloads and nutritional status. An accurate weight is also important for appropriate functioning of equipment such as hospital bed alarms. The review of related studies suggested that daily weights could be more accurate than intake and output when used alone to determine fluid volume status in hospitalized patients. Although not considered a vital sign such as a blood pressure, daily weights are obtained routinely with the intention of utilizing the information for medical treatment and determining additional interventions. Nursing staff generally understand the necessity of weighing patients and obtain weights routinely, but the accuracy and validity of the weight is frequently inaccurately measured in daily practice. Standardization of methods used to obtain weights could help to ensure that this essential information is reliable and is an accurate tool when used for evaluation. In addition to standardization, appropriate training of nursing staff is essential to assure that weight measurements are reliable and valid.

The purpose of this education program was to educate nursing staff regarding procedures to obtain accurate daily weights.

Literature Review

A comprehensive literature review was completed and included searches from the years 1990-2013. Search engines utilized included CINAHL, PubMed and Ovid and the following key words were searched: fluid balance, daily weight, nursing effectiveness, scale consistency, nursing process, improved nursing practice, and estimation of fluid status. The literature review will provide an overview of the following areas: nursing process, fluid balance, and body weight, and research related to fluid balance and weight management.

Nursing Process: Overview

In order to best identify and treat patient problems, the nursing process must be utilized (Lewis, 2011). The nursing process is a problem-solving methodology that provides a systematized structure to the practice of nursing (Lewis). It is a reliable and valuable method of nursing practice that involves several identified steps, including assessment, diagnosis, outcomes/planning, and evaluation. A nurse will first use an organized, systematic evaluation to assemble and explore information about the patient. The assessment is the first step in delivering nursing care in any patient environment. A nurse's assessment incorporates physiological facts, as well as psychological, sociocultural, spiritual, economic, and life-style dynamics (American Nurses Association, [ANA] 2013). The accuracy of subjective and objective data informs the development of the nursing diagnosis, the second step in the nursing process (Lewis). Inappropriate assumptions can occur following inaccurate data collection, and lead to the wrong diagnosis and inappropriate monitoring and care delivery (Lewis).

The nurse formulates a diagnosis after the assessment is initiated. The assessment is never fully complete and it is ongoing at all times. This phase begins with the bundling of collected data and then ends with a conclusion in regards to the clinical status of the patient (Lewis, 2011). The nursing diagnosis is the nurse's clinical conclusion concerning the patient's reaction to actual or potential health conditions or patient needs. The diagnosis reflects not only that the patient has an actual problem, but that problem has then contributed to other problems, or has the potential to cause complications. The nursing diagnosis is the foundation for the nursing plan of care (ANA, 2013). The examination of the data collected is then compared to predictable norms to determine the severity of the presenting or potential diagnosis (Lewis).

The next step in the nursing process is the determination of patient outcomes and a plan of care based on the first two steps of assessment and diagnosis (ANA, 2013). The nurse arranges measurable and achievable short- and long-range goals for the patient (ANA). Some examples of this step could be an activity such as moving from bed to chair at least a few times per day or ensuring adequate nutrition by eating smaller, more frequent meals. During this stage the nurse must also determine urgency of the identified problem and then prioritize them issues (Lewis, 2011). The patient care plan is documented to reflect the assessment data, diagnosis, and goals so that nurses as well as other health professionals providing care for the patient have access to this information (ANA, 2013).

Nursing care is implemented after completing the prior steps in the nursing process and then formulating the care plan. Following these steps ensures that continuity throughout hospitalization and/or discharge can best be assured on a routine and frequent

basis. Patient outcomes are documented and frequently the evaluated based on the patient's condition and the effectiveness of nursing care (ANA, 2013). Another important point for implementation is the delegation of the nursing care to the appropriately competent individuals that assist in care delivery (Lewis, 2011).

The effectiveness of the nursing process and the linkage to patient outcomes has been discussed in the literature. Maas and Delaney (2004) examined the nursing process and its' relationship to patient outcomes in an article that reviewed to need for sizeable nursing databases. Currently the focus of healthcare has been cost and subsequently cost containment and how this will affect the quality of healthcare. This concern has stimulated interest in patient outcomes and their linkage with interventions in studies of healthcare effectiveness. The environment in which nurses' practice must value evidence-based practice and actively promote the study and evaluation of interventions, and then provide time for nurses to critically think (Maas & Delaney). Nurses in the acute care setting must actively engage in in evaluating the outcomes of nursing care and identify nursing care processes that generate these effects. Qualities of care measures tend to emphasize the structure, process and outcomes of care and how they correlate (Lee, Chang, Pearson, Kahn & Rubenstein, 1999). Relevant to the purposes of this proposed project, an accurate assessment includes standardized and accurate weights obtained in the acute care setting to improve patient outcomes and reduce negative patient outcomes (Evans, 2010).

Fluid Balance and Body Weight

In order for individuals to stay healthy, it is vital to maintain an adequate fluid balance (Scales & Pilsworth, 2008). Fluid balance is an expression often used in clinical practice for describing the actual balance of the input and output of fluids in the body to

allow metabolic processes to function appropriately (Shepard, 2011). Fluid balance often varies throughout the day, usually only less than 1% in normal people. Fluid balance is controlled by thirst, which is a normal response to fluid depletion, caused by a reduction of the secretion of saliva and dryness of the oral mucosa (Shepard).

When fluid intake is inadequate or fluid loss is excessive, dehydration can occur and lead to other alterations that affect cardiac and renal function, and electrolyte balance. If the kidneys excrete inadequate amounts of urine, this may then lead to volume overload, renal failure and electrolyte toxicity (Scales & Pilsworth, 2008). In the acute care setting, accurate documentation of fluid intake and output volumes are essentials of nursing practice. Poor fluid balance management and poor documentation of intake and output contributes to negative outcomes in acutely ill patients (Scales & Pilsworth). Several nursing assessment techniques are used to determine fluid status, such as observations of changes in vital signs, capillary refill time, skin elasticity, urine output and body weight.

Weight can be defined as “the amount or quantity of heaviness or mass; [or] amount a thing weighs”(Merriam-Webster.com 2014). Body weight and fluid balance, are two different but related measures used by nurses to monitor, assess, and provide evidence of a patients’ fluid volume status (Eastwood, 2006). Total body weight consists of approximately 52% fluid in women and is approximately 60% fluid in men (Shepard, 2011). An accurate daily weight measurement provides additional information about the patient’s fluid balance, and remains the easiest method to determine volume status (Lewis, 2011). A 5% difference in fluid volume can grossly change a person’s health status; therefore an accurate weight may indicate this change faster than other assessment

methods. In select patients, such as those with heart or renal disease, even a seemingly minimal increase in weight of 1 kilogram (2.2 pounds) is equivalent to 1000 milliliters (1 liter) of fluid that is retained, provided that the weight was obtained utilizing a standard measure (Lewis).

A report published by the Pennsylvania Patient Safety Advisory stated that a patient's weight is one of the single most important tools to appropriately calculate medication dosages (ECRI Institute & ISMP, 2009). Clinical populations greatly affected by inaccurate or missed weights causing significant drug events include oncology, geriatric, pediatric and neonate. These patient populations use Formulas such as the Cockcroft-Gault and the Harris-Benedict formulas that specifically require an accurate patient weight in order to prescribe a medication. The advisory reviewed 479 event reports submitted to the Pennsylvania Patient Safety Authority during the timeframe of June 2004 to November 2008 that had explicitly cited medication errors caused from breakdowns in the process of obtaining, documenting, and/or communicating patient weights (ECRI Institute & ISMP,). Out of the 479 reviewed events; 448 of the reports shared the top five mutual medication error types. The most common error was wrong dosage/overdose and wrong dosage/underdose. The hospital units observed in reporting these events were emergency department, pharmacy, and medical-surgical units. During the analysis, two common themes were identified. The first was related to the failure to obtain an accurate, up-to-date patient weight, and the second was identified as a missing weight. The reasons cited included weights not obtained due to emergency presentation to the hospital, weights documented but not up to date, and weight documented in pounds versus. Kilograms. Risk reduction strategies included obtaining an accurate weight

starting at point of entry, documenting weight in all systems using medication prescribing and documenting weight in a standardized method such as in kilograms (ECRI Institute & ISMP).

Studies related to Fluid Balance and Weight Measurement

Knowledge of patient height and weight are used in routine calculations for critically ill patients (Bloomfield, Steel, MacLeenan & Noble, 2006). However, the actual measurements are not always obtained for such calculations as infusion rates and drug dosing. Bloomfield et al. investigated the accuracy of visual estimation of height and weight in critically ill patients in an ICU. The study was conducted in a 16 bed mixed medical surgical ICU on two separate days, three weeks apart. Subjects were ICU patients who had maintained the stay in the ICU for that study day. The subjects were weighted and measured by two different nurses using a lifting apparatus that was calibrated with a weighting facility and a rigid stretcher for height. Descriptive data between visual estimates and measured values were presented graphically in a box and whisker plots. Weight error ranged from 34 kg underestimate to a 55 kg overestimate. Height error varied from a 16 cm underestimate to a 27 cm overestimate. The percentage varied from 33% underestimate and a 45% overestimate in weight and a difference of 9% underestimate and an 18% overestimate for height. The findings of the study concluded that estimates for weight were inaccurate by 20% or more. Clinical judgments and interventions should be based on actual body weights and not estimated body weights and therefore patient care could be negatively impacted by inaccurate estimations. Body weight and height that are individual estimates are commonly known to be inaccurate.

Accurate weight measurements should be obtained to best assure the related interventions targeting the critically ill are effective (Bloomfield).

Investigations related to documented fluid balance and body weight have shown them to be inaccurate and unreliable. Eastwood (2006) studied the reliability of recorded fluid balance and weight change in patients undergoing cardiac surgery. Two research questions were addressed: Is there a change in body weight of patients undergoing cardiac surgery during the perioperative period?: Is there a difference between recorded fluid balance and body weight change in patients undergoing cardiac surgery during the perioperative period? The perioperative period was defined as the timeframe from the night prior to surgery to the time of discharge from the ICU unit. This descriptive study was conducted on a cardiac care unit and a medical ICU in a private hospital in Melbourne, Australia between December 2003 through May 2004. Subjects had weight measurements recorded on three separate occurrences with the first one obtained the night prior to surgery and the last one measured on day of discharge. A standardized practice was utilized that included weighting all patients with the same amount of clothing, and with the same scale every time in order to obtain accurate measurements. To record the fluid balance, a specifically designed data collection form that required a specific method for data collection was established prior to the study.

Thirty patients demonstrated an increase in weight when discharged from the ICU. The mean disparity in weight between the preoperative time and ICU discharge was a gain of 3.34kg (SD = 1.17, 95% CI: 2.70- 3.98 kg. $p < .001$) and the change in preoperative weight for two patients with a decrease in weight was -3.90 and 1.45 kg respectively. The average preoperative weight was 80.97 kg and average postoperative

weight was 83.94kg. The fluid balance fluctuated from -4.86 to +5.93L. The median balance was +1.77 liters and the difference between the median documented fluid and the obtained body weight during the perioperative period was significant ($p = .01$). Only three patients (9.75%) in the study met the conditions for accurately documented fluid balance. Underestimated weight gain with recorded fluid balances was reported in 19 (59.4%) of the patients. Ten patients (31.2%) had documented fluid balance that overestimated weight gain. Eastwood examined the difference in weight change and the accuracy of standard fluid balance documentation and concluded the association between recorded fluid balance and obtained weight was inaccurate. The recorded fluid balance and measurement of weight were not reliable or accurate; use of recorded fluid balance to determine change in weight was not the most reliable method (Eastwood).

In an acute care setting daily weight may be obtained in a multitude of different ways such as wheelchair scales and bed scales. The purpose of a study conducted by Byrd et al. (2011) was to examine the equipment itself instead of human error as contributors to inaccurate daily weights. A quasi-experimental design with a convenience sample of subjects aged 18 years old and older was used to obtain data in a large Midwest community hospital. Employees and volunteers were enrolled during an annual nursing event. The equipment used in the study included four regularly used scales, a built in bed scale, a wheelchair scale, a standing digital scale and a standing mechanical scale. Scales were maintained per manufacturer's recommendations and zeroed prior to use of the equipment. A standardized amount of laundry and attire was determined prior to measurement. Study results determined that variability was minimal between the different types of scales, but it was statistically significant ($p < 0.001$) when comparing

data. Difference between the same participants' weight when measured on wheelchair scale versus bed scale was as small as 2.99 pounds and as great as 3.54 pounds. The authors concluded that weight must be obtained using the same scale in order to be accurate. A difference of 2.99-3.54 pounds in one day would prompt health care professionals to increase monitoring and possible additional interventions.

In another study, Schneider, Baldwin, Freitag, Glassford and Bellomo (2012) examined the documented fluid balance in critical care patients and the ability to obtain daily weights in this population. Fluid management in crucially ill patients is imperative to obtain positive patient outcomes in the ICU. The recording of intake and output in the intensive care units assists caregivers with the estimate of daily fluid balance. Hence, when changes occur in body weight over a short duration of time, it is generally assumed to be associated with changes in fluid volume status (Schneider et al). The purpose of this study was to evaluate the practicality and simplicity of using study designated beds in the ICU to accurately weigh patients and then to test the association between estimated fluid balance by traditional methods and body weight using the study device, which was an ICU bed scale. This observational study included all admitted patients in ICU who occupied a bed with weighting ability for a consecutive 48 hour time period.

Prior to the study, basic education was provided to the nursing staff that included how to zero the beds using a standardized list of linen and specific protocols to be used in the study. The patients were then weighed at midnight every night to maintain consistency with the 24-hour fluid balance calculations. In addition to obtaining an admission weight, the researchers examined fluid balance by using a calculation that involved electronic software program and then allowed for insensible fluid losses. The

electronic software was available in each ICU bay and required hourly data input of intake and output and then locked out at midnight for the totals. The authors compared weight for two successive days and the corresponding 24-hour fluid balances. The study documented that changes in body weight and fluid balance were correlated in only 243 of the 423 observations (57.4%). Compliance of nursing staff with the protocol to calibrate the bed before admission or failure to complete the protocol of body weight measurement decreased during the first three months of the study, because of this finding the study could not obtain enough evidence to correlate. The findings indicated that even with modern technology with beds that have weighing capability and trained staff, weight obtainment is unreliable and most likely related to staff adherence to protocols.

In summary, as part of the nursing process, nurses perform various interventions that are relevant to monitoring patients overall fluid balance. Nurses typically perform a comprehensive assessment as well as the standardized vital signs in order to ensure positive patient outcomes. Nurses often assess and document a functional status, Activities of Daily Living (ADL), and a complete physical assessment in order to fully assess and monitor a patient's fluid status.

Nurses use different methods to evaluate fluid volume status, the most reliable and valuable tool is a daily weight. However, as demonstrated in the literature, the act of actually obtaining the daily weight is often not consistent, leading to unreliable data. In any environment, consistency is essential in obtaining an accurate weight. Differences including the equipment used, when it was maintained and calibrated, and standard bedding or clothing included can significantly affect the results obtained. Without standardization of the method and process, and education of nursing staff, daily weights

will remain an unreliable and invalid tool for clinical decision-making. The purpose of this education program is to educate nursing staff regarding procedures to obtain accurate daily weights.

Next, the theoretical framework that guided this study will be presented

Theoretical Framework

The measurement of weight is simplistic in principle. Virginia Henderson was known for her definition of nursing which states "The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge" (Henderson, 1970 pg. 15). Henderson proposed nurses do this in such ways as to help patients gain independence as rapidly as possible (Henderson). One of Henderson's lasting contributions is her well known definition of nursing, which calls for the nurse to be an expert and independent practitioner, equipped with the right knowledge in basic nursing care to achieve nursing goals. Henderson's definition of nursing, along with the 14 basic needs that she identified, advanced the teaching of nursing interventions relevant to specific disease conditions. Henderson suggested, as part of the nursing process, the nurse develops an effective plan for the collection of necessary information. Failure to develop an adequate plan results in a low quality of routine care. "Many procedures have to do with care, rather than cure; they do not require a physician's prescription..." (Henderson, 1970, pg. 32).

Henderson listed 14 basic needs that are performed independently by nursing staff. Breathe normally, eat and drink adequately, eliminate body wastes, and sleep and rest are examples of basic needs from the list that relate to the measurement and documentation of daily weights and fluid volume status in hospitalized patients.

Next, the study methodology will be presented.

Methodology

Purpose

The purpose of this education program was to educate nursing staff regarding procedures to obtain an accurate daily weight.

Design

The program development used a pre-survey, intervention and post-survey design. The educational program for nursing staff served as the intervention.

Sample and Site

The target of the program development was nursing staff employed on one of the medical-surgical units at The Miriam Hospital in Providence, RI. Nursing staff included all registered nurses (RNs) and certified nursing assistances (CNAs) employed on the unit excluding float staff. The Miriam Hospital is one acute medical hospital in the Lifespan System. A 30-bed medical surgical unit was utilized as the study site. This unit had a cardiovascular population with 24 telemetry beds.

Program Development

Background. Weight is an important factor in hospital clinical decision-making and can significantly impact clinical interventions related to medication dosage, assessment of fluid volume deficits or overloads and nutritional status. An accurate weight is also important for appropriate functioning of equipment such as hospital bed alarms. The review of related studies suggested that daily weights could be more accurate than documented intake and output measures when used alone to determine fluid volume status in hospitalized patients. Although not considered a vital sign such as a blood pressure, daily weights are obtained routinely with the intention of utilizing the

information for medical treatment and determining additional interventions. Nursing staff generally understand the necessity of weighing patients and obtain weights routinely, but the accuracy and validity of the weight is frequently inaccurate in daily practice. Standardization of methods used to obtain weights can help ensure that this essential information is reliable and accurate when used for evaluation. In addition to standardization, appropriate training of nursing staff is essential to assuring that weight measurements are reliable and valid.

Needs assessment. At an Evidence Based Best Practice and Research Council meeting at The Miriam Hospital, participants discussed and reviewed literature describing the inaccuracy of intake and output in determining fluid balance and fluid status change in the acute care setting. The current daily weight policy (NU-41) was reviewed; this policy was developed to standardize the process for weighing hospitalized patients. The goal was to promote consistency and accuracy of measurement throughout the hospital stay. As part of this discussion, nursing staff voiced concern that there were discrepancies between current practice and the hospital policy. This inconsistent practice had led many practitioners to believe that recorded patient weights were inaccurate which in turn contributed to dependence on the unnecessary and prolonged use of urinary catheters and strict intake and output measurement. That policy was subsequently reviewed, amended, and approved.

Subsequently the Council formed a subcommittee that developed and conducted a survey of the nursing staff hospital-wide to determine what the current practice was to obtain daily weights (Appendix A). Based on survey responses, it was determined that a policy change was indicated and that education of the nursing staff was warranted. A

revised policy was drafted with the intent of this project to educate nurses on medical-surgical units about the revised policy and to re-survey nurses related to procedures for obtaining daily weight.

Program Design and Planning. The education program was presented to all nursing staff on 4 East at The Miriam Hospital. A challenge was that time for unit-based in-services was very limited. Thus several methods for presenting material were used in order to reach as many nursing staff members as possible in a one-month timeframe. These included: bedside in-services with nurses on a one to one or small group basis; presentation at regularly scheduled staff meetings; and presentation of content in written form on an electronic bulletin board for 4 East. Sign in sheets were used to determine the number of staff who participated in the education.

The content taught in this program was developed from review of literature and the revised daily weight policy. The content and objectives are presented in Table 1.

Table 1.

Obtaining Accurate Daily Weights: Content and Objectives:

Content Outline	Learning Objective
Brief review of relevant literature and basis for changing current practice	Describe rationale for obtaining accurate daily weights
Review of update daily weight policy with emphasis on changes	Explain the updated changes to the
Discuss the process of obtaining a daily weight according to the updated weight policy	Summarize steps to obtain a daily weight in accordance with revised policy

Procedures and Program Implementation

Nursing staff on 4 East at The Miriam Hospital were invited to participate in the educational program via an IRB approved flyer that was posted in the staff lounge (Appendix B). The IRB approved informational letter (Appendix C) was also posted to ensure nursing staff were aware that participation in the educational program and completion of the post survey was voluntary. Prior to the intervention and regardless of method of instruction, the informational letter was presented to the staff. The letter described the procedures, what they should expect if they chose to participate and that they were free to not participate.

Staff members who chose to participate were presented with an informational letter and a copy of the revised daily weight policy (Appendix D). The content was addressed by briefly reviewing the literature review, need for education, reviewing revised daily weight policy and then asking the participants the process for obtaining daily weights. This content took approximately five minutes depending on interruptions and questions. Questions and concerns were answered as needed. Staff who participated in the intervention were given a post survey immediately following the instruction, asked to complete it anonymously and to deposit it in a sealed drop box in the staff lounge on the unit. The survey contained no participant identifying information.

Measurement

A pre survey had been developed as part of the Evidence Based Practice Subcommittee study and the results were made available by unit. In order to obtain comparable results, a similar survey with additional questions for program evaluation was utilized after the educational program as a post survey (Appendix E). Staff nurses were

also being asked to complete an evaluation of the program by completing two additional questions (Appendix F).

Data Analysis

Descriptive statistics were performed on the study variables. Overall differences in the aggregate pre and post scores were compared. Data from the surveys were stored in a locked file to which only the researcher and the faculty advisor have access.

Results

Twenty-three out of a potential 42 (55%) of nurses completed the training and the survey. Post training survey responses are illustrated in Table 2. Questions one through five were survey questions that were used for the pre-survey questions and were used to test knowledge post education. Several of the questions, including question 2, 3 and 5, allowed respondents to indicate more than one response.

As illustrated in question one, the majority of nursing staff (n=20; 87%) knew there was a policy already in place for daily weights. In comparison, on the baseline pre-survey (Appendix A), only 55% (n=16) were aware that there was an existing policy. Question two revealed that the perceptions about who actually obtained daily weights differed between CNA and RN staff: 100% CNAs staff obtained daily weights versus 23% (n=7) RN. These responses were similar to those on the pre-survey (38% CNAs; 93% RNs).

Question three queried how often the bed was zeroed to obtain weights. The most common answer was “on admission only”: 61% post survey versus 69% pre-survey. Question four asked nurses if they had patients void before daily weight being taken. Sixty one percent (n=14) of staff had the patient void prior to obtaining the weight while 26% (n=6) did not. Pre survey results were similar (59% had the patient void prior to obtaining weights versus 31% did not have patient void. Question five asked what the process was if the bed scale was broken. In the post survey 65% of staff answered that they would switch beds, as compared to 48% in the pre survey. Three nursing staff members (13%) responded that they would call biomed: no nursing staff responded in that manner in the pre survey. Only one person (4%) responded that they would not

obtain the weight as compared to six (38%) in the pre-survey.

Table 2

Summary of Weights Survey Results After Education (n = 23)

Survey Question	Responses
Q1. Are you aware there is a daily weight policy for TMH on the intranet? (only one answer)	Yes 20 (87%) No 3 (13%)
Q2. Who performs daily weights on your unit?	RN: 7 (23%) CNA: 23 (100%)
Q3. How often is the bed zeroed to obtain weights?	On admission only: 14 (61%) Daily: 8 (35%) Never: 6 (26%) As needed: 6 (26%) When other things are added or taken away: 1 (4%) Prior to admission: 1 (4%)
Q4. Do you have your patient void prior to weight being obtained?	Yes: 14 (61%) No: 6 (26%) Sometimes: 3 (13%)
Q5. If you are unable to get your patient out of bed and the bed scale is broken, how would you obtain a weight?	Switch beds: 15 (65%) Call Biomed: 3 (13%) Unable to obtain: 3 (13%) Estimate: 1 (4%) Hoyer patient OOB to zero bed: 6 (26%) Not do it: 1 (4%) Not answered: 1 (4%)
Q6. How useful was this program in explaining the proposed revision of the daily weight?	Very useful: 22 (96%) Somewhat useful: 0 (0%) Not useful at all: 0 (0%) Not completed: 1 (4%)
Q7. How likely are you to perform weights according to the revised policy?	Likely: 20 (87%) Somewhat likely: 2 (9%) Not likely at all: 0 Not completed: 1 (4%)

Question number six and seven were utilized for program evaluation and demonstrated a positive response to the education of daily weighing process provided to

the nursing staff. And up to 87% reported that they were likely to perform weights according to the revised policy.

Next, the summary and conclusions will be presented

Summary and Conclusions

Weight is an important factor in hospital clinical decision-making and can significantly impact clinical interventions related to medication dosing, assessment of fluid volume deficits or overloads, and nutritional status. Therefore, an accurate weight is an essential piece of information. The review of related studies suggested that daily weights could be more accurate than intake and output measures when used alone to determine fluid volume status in hospitalized patients. Although not considered a vital sign such as a blood pressure, daily weights are obtained routinely with the intention of utilizing the information for medical treatment and determining additional interventions. Nursing staff generally understand the necessity of weighing patients and obtain weights routinely, but the accuracy and validity of the weight is frequently an issue in daily practice. Actual body weight can significantly change throughout the hospital stay and weight estimates are inaccurate by up to 20%. Weight is the only true measurement for most accurate calculations such as mechanical ventilation (Bloomfield, 2006).

Standardization of methods used to obtain weights can help ensure that this essential information is reliable and is an accurate tool when used for medical decision-making. In addition to standardization, appropriate training of nursing staff is essential to assure that weight measurements are reliable and valid. The purpose of this education program was to educate nursing staff regarding procedures to obtain an accurate daily weight. A pre survey had been developed as part of an earlier study by staff nurses members of the Evidence Based Practice subcommittee. In order to obtain comparable results, a similar survey was utilized after the educational program as a post survey (Appendix E). Staff nurses were also being asked to complete an evaluation of the

program by completing two additional questions (Appendix F).

The majority of nursing staff who participated (87%) knew there was a policy already in place for daily weights as compared to the pre-survey (Appendix A), which showed that only 55% knew of the policy prior to the education. However, according to the survey results, daily weights were predominately an intervention performed by the CNA staff, who would likely be less aware of the implications and importance of a change of weight as compared to staff nurses. Analyzing results from question four determined that consistency was not apparent for standardization of voiding prior to obtaining daily weights. In question five most staff stated they would 'switch out the bed' but would not follow through and call the biomedical engineering department to fix the bed. However, compared to the pre-survey (Appendix A), these responses improved, with three nursing staff members (13%) calling biomedical engineering department post intervention. Both program evaluation questions demonstrated a positive response to the education provided to the nursing staff and consensus to perform weights accurately according to the new weight policy.

Study limitations included that staff were not relieved of their current duties and were frequently interrupted during the education sessions. Recent staff vacancies made it more difficult to educate current staff members since the pre-survey potentially assessed different staff than the post survey. While the pre survey and post surveys were very similar, they were not identical, making the results not completely comparable.

An appropriate standardization and consistency of obtaining daily weights is clearly important to caring for hospitalized patients. Education and implementation of standardized practice is imperative in achieving this goal. Implementation of a tailored

education program increased the awareness of nursing staff of a policy for obtaining daily weight, which may in turn standardize the process used to obtain daily weights in this setting. According to the post survey, nursing staff responded that they would be more likely to obtain daily weights according to the revised policy. This will then ensure a standard practice with more reliable and accurate results. This finding also indicated the need for education of the nursing staff. Based on the education provided, the nursing staff members were more likely to replace faulty beds in order to maintain consistency and accuracy of daily weight measurement.

Even though modern technology such as digital beds can obtain accurate weights, the measurement still requires user knowledge of hospital policy and procedure to obtain a useful and accurate weight. This education program for nursing staff regarding daily weights was effective in improving post survey scores. These findings suggest that replicating the education hospital-wide to all nursing staff members may be beneficial.

Recommendations and Implications for Advanced Practice Nursing

Weight is an essential piece of information in clinical decision-making and can significantly impact many clinical interventions. Therefore, ensuring that weights are performed consistently, in a standardized way, is necessary if results are to be interpreted as reliable and valid. The findings from this project support the implementation of a daily weight policy along with a hospital wide policy to provide standardization for daily weights of hospitalized patients in order to reduce errors and provide safer patient care. Estimates of weight or improper weighing techniques result in unreliable data and standardization and accurate measurement may lead to better patient outcomes. Nursing staff performing patient weights are not always equipped with the appropriate equipment in order to ensure accuracy. Equipment needs to be useful and available as well and functional and calibrated according to manufactures guidelines. Currently this task tends to be assigned to ancillary nursing staff who may not possess the necessary critical thinking capacity to ensure the appropriate standardized steps are taken. In some hospitals it is not considered best practice to have CNAs routinely obtain vital signs such as blood pressures due to the interpretation and value of the information being obtained. In order to ensure accurate weights are obtained, nurses should routinely obtain weights and thus have the knowledge of knowing it was obtained using a standardize method to obtain the valuable information. Nurses weighing patients may not be feasible in some settings and may be delegated to nursing assistants; if this occurs, CNAs must be adequately trained, retrained and supervised in order to accurately perform the task. Communication between the nurses and ancillary nursing staff about changes in weights in high-risk patient populations and other important factors such as malfunctioning

equipment should also be on going.

Basic nursing educational programs should further stress the importance of daily weights as well as the reasoning for ensuring accuracy of the data that is obtained.

Perhaps if weights were considered a 'vital' sign the importance of the accuracy would then be stressed and compliance with standardized approaches would improved.

Education of nursing staff should be geared toward evidence-based approaches as to how to obtain an accurate daily weight. Consistent education to reinforce the importance of accurate daily weight, which is e used to guide on numerous, essential therapies is indicated.

Though it has been proven that evidence based practice improves patient outcomes, traditional practice among nursing staff is often difficulty to change. Several years ago the Institute of Medicine (IOM) recommended that health care workers use evidence-based practice in order to reduce variations in standards of care (Makic, Rauen, Watson & Poteet, 2014). Since nurses make up the largest portion of the health care work force, they are instrumental in delivering care based on evidence. Practicing nursing simply based on tradition is not considering best practice evidence-based practice should be reinforced starting with nursing school and in all levels of nursing preparation (Makic, Rauen, Watson & Poteet, 2014). Advanced practice nurses could assume a leadership role in encouraging and educating nursing staff regarding the evidence and reasoning behind obtaining data that is valid and completely accurate. They could also heighten awareness during audits of charts and during interdisciplinary rounds, sharing this valuable information with other team members.

Further research should be done to understand the barriers to obtaining accurate

daily weights and the effects on patient outcomes. Additional research regarding the impact of a standardized approach on patient outcomes would be useful. Further research should focus on whether or not accurate and standardized weights impact or decrease length of stay.

It has been recommended that the study facility add weights as a vital sign in order to heighten the awareness of the importance of daily weights. Advance practice nurses overall could be instrumental in campaigning for accuracy of this critical physiologic variable. This initiative could become an important national health policy issue; if key quality organizations like the Institute for Healthcare Improvement (IHI) aligned with making weights a vital sign, nationwide change could be a reality.

References

- American Nurses Association. (n.d.). Retrieved from <http://www.nursingworld.org/EspeciallyForYou/What-is-Nursing/Tools-You-Need/Thenursingprocess.html>
- Bloomfield, R., Steel, E., MacLeenan, G., & Noble, D. (2006). Accuracy of weight and height estimation in an intensive care unit: Implications for clinical practice and research. *Critical Care Medicine*, 34(8), 2153-2157.
- Byrd, J., Langlord, A., Paden, S., Plackemeier, W., Seidelman, C., Valla, M., & Wills, R. (2011). Scale consistency study: How accurate are inpatient hospital scales?. *Nursing*, (November), 21-24. doi: 10.1097/01.nurse.0000406504.91695.b4
- Eastwood, G. M. (2006). Evaluating the reliability of recorded fluid balance to approximate body weight change in patients undergoing cardiac surgery . *Heart & Lung* , 14(1), 27-33. doi: 10.1016/j.hrtlng.2005.06.001
- ECRI Institute and ISMP (2009). Pennsylvania Patient Safety. *Medication errors: Significance of accurate patient weights* (Volume 6, NO. 1).
- Evans, A. (2010). Positive patient outcomes in acute care: does obtaining and recording accurate weight make a difference?. *Australian Journal of Advanced Nursing*, 29(2), 62-67.
- Henderson, V. (1970). *The nature of nursing*. (Fourth ed., pp. 24-33). New York: The Macmillian Company.
- Lee, J. L., Chang, B. L., Pearson, M. L., Kahn, K. L., & Rubenstein, L. (1999). Does what nurses do affect clinical outcomes for hospitalized patients?. *HSR:Health Services Research*, 35(5 Part I), 1011-1032.

- Lewis, S. M. (2011). *Medical-surgical nursing: Assessment and management of clinical problems*. St. Louis, Mo: Elsevier/Mosby.
- Maas, M., & Delaney, C. (2004). Nursing process outcome linkage research. *Medical Care*, 42(2), 40-48. doi: 10.1097/01.mlr.000109291.44014.cb
- Merriam-Webster. Weight. 2014. In *Merriam-Webster.com*. Retrieved February 12 2014, from <http://www.merriam-webster.com/dictionary/weight>
- Scales, K., & Pilsworth, J. (2008). The importance of fluid balance in clinical practice. *Nursing Standard*, 22(47), 50-57.
- Schneider, A. G., Baldwin, I., Freitag, E., Glassford, N., & Bellomo, R. (2012). Estimation of fluid status changes in critically ill patients: Fluid balance chart or electronic bed weight?. *Journal of Critical Care*, 27, 745 e7-745 e12.
- Shepard, A. (2011). Measuring and managing fluid balance . *Nursing Times*, 19(July), 19-25.

Appendix A

Pre-Education Survey

4 East RNs and CNAs (Respondents=29)

Q1. Are you aware that there is a daily weight policy at TMH?	Yes 16 (55%) No 13 (45%)
Q2. Who performs daily weights on your unit?	RN: 11 CNA: 27 OR Assistant: 1 (Could circle more than one answer)
Q3. How often is the bed zeroed to obtain weights?	On admission only: 20 Daily: 7 Other reasons: 3 (when patient gets out of bed, occasionally, no answer)
Q4. Do you have your patient void prior to weight being obtained?	Yes 17 No 9 Sometimes 2
Q5. If you are unable to get your patient out of bed and the bed scale is broken, how would you obtain a weight?	Get new bed 14 No answer 6 Hoyer 6 Don't obtain a weight 1 Don't know 1 Go by patient weight 1 Tell RN 2

APPENDIX B
ATTENTION 4 EAST NURSING STAFF
INTERESTED IN OBTAINING AN ACCURATE AND
RELIABLE DAILY WEIGHT



Nursing Education Program for Nursing Staff

Related to Obtaining Accurate Daily Weights

You are being asked to consider participation in a research project that involves accuracy of daily weights. If you agree, you will be asked to attend an education program regarding procedures to obtain an accurate daily weight and then to complete a short post-survey. Your participation is voluntary and responses to the survey anonymous.

Appendix C

IRB Approval: 6/16/2014
IRB Accepted: 7/14/2014

Nursing Education Program for Nursing Staff Related to Obtaining Accurate Daily
Weights
Informational Letter

A research study is being conducted to examine at current hospital practice and policies related to obtaining daily weights. The purpose of this study is to educate nursing staff regarding procedures to obtain an accurate daily weight

The student researcher is conducting this study as part of a requirement for completion of a MSN degree at Rhode Island College School of Nursing. The researcher is also a member of the Evidence Based Practice and Research Council, which has conducted earlier work on this topic.

I would like to ask you to participate in this education program and post-survey. I am distributing this survey to all nursing staff members, consisting of RNs and CNAs on 4 east. If you choose to voluntarily participate, you will be asked to complete an educational program that will take approximately 10 minutes and then complete a short survey with 5 multiple choice/short written answer questions. There are no questions that should cause you any distress. Your taking part in this educational program is completely voluntary. If you do not wish to complete the survey, you are free to choose not to do so. I am hoping the completed surveys will provide understanding into how weights are currently obtained and if they can be obtained more efficiently and accurately in the hospital setting after education is complete.

The responses from the survey will be kept confidential. There will be no identifying or personal information requested, only indication of the unit where the survey was completed.

If you have any questions about the survey or research study, please feel free to contact me or the primary faculty advisor Cynthia Padula , CPadula@Lifespan.org
If you have any questions about your right as a survey participate, please feel free to call
Patricia

Houser at the IRB office at 401-444-2099.

Thank you very much for your time and assistance.
Jessica Prew, RN, BSN, BC
401-793-3425, jprew1@lifespan.org

Appendix D

The Miriam Hospital
Policy and Procedure

Subject:
Daily Weights

File Under:
NU-41

Issuing Department
Nursing

Page 1 of 2

Latest Review
Dates:

Latest Revision
Dates:

11/12, __/14

Original Date:
September 2010

Approval By:

Maria Ducharme, MS, RN, NEA-BC
Senior Vice President, Patient Care Services and Chief Nursing Officer

I. PURPOSE

To standardize the process for weighing hospitalized patients to promote consistency and accuracy of measurement across time

Consistency and accuracy in weight measurement is necessary for clinically meaningful assessment of fluid balance over time; for appropriate drug, radiation and anesthetics dosing; and for weight trending.

II. POLICY

1. Registered Nurses (RNs), Certified Nursing Assistants (CNAs), Collegiate Nurse

Interns (CNIs), or techs may weigh patients.

2. All possible attempts should be made to weigh patient at the same time of day

3. Daily weights will be performed prior to breakfast.

4. Daily weights will be performed after patients void or having an empty indwelling catheter collection bag.

5. RNs should report weight change of > 2 lbs. for 1 to 2 consecutive days (i.e., 2 lbs. in one

day, or 2 lbs. in 2 days) to appropriate credentialed provider caring for patient.

6. The patient's weight will be documented with the vital signs in the approved location.

III. PROCEDURE for Bed Scale

1. Zero the bed prior to admission, flat and unoccupied, and containing only required linens and equipment.
2. An index card, documenting items on bed at time of initial zeroing, should be taped to the footboard of bed to be utilized for consistency with weights and future bed zeroing.
3. Weigh patient on a zeroed bed, with only the items on the bed that were on it at the time of zeroing. *Note:* Any items hanging from the bed or on the patient must be held off the bed or hung adjacent to the bed. Examples: Drainage bags, wound VACs, telemetry transmitters, compression boot pumps.
4. Re-zero bed when:
 - a. The accuracy of the weight is in question
 - b. A low air loss mattress overlay is added (see next item)

Note: Hill-Rom and Stryker beds remain zeroed even when unplugged.
5. If a low air loss overlay (with or without an MRS overlay base) is added:
 - a. Re-zero the unoccupied bed with low air loss overlay (and MRS overlay base, if applicable) and one incontinence pad.
 - b. If the patient cannot be removed to re-zero the bed, subtract the weight of the overlay (3 lbs. inflated) or, if applicable, the weight of the low air loss overlay plus MRS overlay base (3 lbs. + 5 lbs. = 8 lbs. total) from the assessed weight to determine the patient's true weight.
 - c. Make sure blower is not secured to bed. If it is, 11 lbs. would have to be removed from weight totals.
6. Contact Biomedical Engineering if the scale or bed does not seem to be functioning properly or is alarming for servicing. If issues with bed cannot be resolved, obtain and move patient to a properly functioning bed; report and document equipment issues.

Appendix E

Post Survey regarding daily weights
RN/CNA/OR assistant staff only

1.) Are you aware there is a daily weight policy for TMH on the intranet? (circle one answer)

YES

NO

2.) Who performs the daily weights on your unit? (circle all that apply)

RN staff

CNA staff

3.) How often is the bed zeroed to obtain daily weights? (please circle one answer or fill in other)

On admission only Daily Never

Other _____

4.) Do you have your patient void prior to weight being obtained?

YES

NO

5.) If you are unable to get your patient out of bed and the bed scale is broken, how would you obtain a weight? (short answer please)

Appendix F

Program Evaluation

How useful was this program in explaining the proposed revision of the daily weight policy? (circle one)

Very useful

Somewhat useful

Not useful at all

How likely are you to perform weights according to the revised policy?

(circle one)

Very useful

Somewhat useful

Not useful at all