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Improving Accuracy of I&O Documentation for Patients on a Medical-Surgical Telemetry

Unit

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NURS 952: Clinical Nurse Leadership

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Abstract

Background

This paper explores suggested ways to increase intake and output (I&O) monitoring accuracy on a medical-surgical telemetry unit. I&O is a crucial marker for many patients to examine their hydration status and intervention efficacy. Various articles were explored to see best practices and varied in setting and outcomes.

Local Problem

A medical-surgical telemetry unit was analyzed and found to have miscommunication in their ability to monitor I&O for patients' ordered fluid restrictions accurately. Patients may be ordered fluid limits for various reasons; however, the most frequent indication on this unit is for heart failure patients.

Methods

A medical-surgical telemetry unit with eighteen beds was the spotlight for this quality improvement project. The project lead used pre- and post-intervention data collection and PDSA cycle approaches. Pre- and post-intervention surveys were used to assess the efficacy of intervention.

Interventions

A new I&O cluster sheet was placed on the unit to streamline workflows. This sheet was designed to increase compliance with I&O monitoring and documentation.

Results

Over the course of four weeks of collecting results, two PDSA cycles were completed. In the first cycle, no patients with fluid restrictions were admitted to the floor. In the second PDSA

cycle, all patients were monitored for I&O. No significant differences were observed before and after the intervention.

Conclusions

More examining needs to be done, and a longer time to collect data to make a firm conclusion on this workflow.

Keywords: intake and output, documentation, fluid restrictions, monitoring, medical-surgical telemetry unit.

Improving Accuracy of I&O Documentation for Patients on a Medical-Surgical Telemetry Unit

Problem Description

For many patients, fluid balance is a crucial indicator of medication efficacy and clinical outcomes. Fluid balance is “the ratio of input and output (I&O) of fluids consumed and excreted from the body” (El-SalamSheta & Mahmoud 74, 2018). Many studies have found that chart documentation of a patient’s I&O is incomplete, with up to 50% of patients missing accurate documentation (Vincent & Mahendiran, 2015). Patients are ordered strict I&O for various reasons, including heart failure, renal impairments, and if dependent on the providers' orders. Having inaccurate fluid balance documentation can lead to changes in medication. Unnecessary changes to drugs or clinical interventions can cause fluid deficits and poor patient outcomes. As staff on a medical-surgical telemetry unit reported, the main problem with documenting I&O properly is a lack of formal communication between patients and clinicians. Recent literature has identified poor documentation resulting from inadequate training and education and increased workload (Madu et al., 2021).

An estimated 6.5 million adults have Heart Failure in the United States, contributing to morbidities and financial costs in the healthcare system (Kwok et al., 2021). On average, a patient with heart failure is hospitalized more frequently than those without and has more frequent readmission than other diagnoses (Kwok et al., 2021). Many variables and services affect the cost of a hospital stay, and on average, a patient admitted for heart failure exacerbation was found to stay approximately 5.4 - 6.5 days and cost roughly \$11,602 - USD 21,482 with a readmission rate of 15.5% (Kwok et al., 2021). Being able to give the highest quality care to heart failure patients when in the hospital can both help to reduce their length of stays as well as

reduce rates of readmission. One critical measurement for these patients is fluid balance and ensuring fluid overload does not occur. Constant I&O documentation is essential to accurately picture a patient's health and medical intervention outcomes (Vincent & Mahendiran, 2015).

Available Knowledge

A literature review was conducted to determine how other organizations address charting regarding fluid balance management and charting accuracy. The databases of Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and Medline were utilized with Boolean terms of "fluid intake," "output," and "monitoring." Between the three databases, 77 articles were identified. Only recent reports from 2015 through 2023 were included in the literature review. All geographical locations were included. Forty-three pieces were removed due to duplication. Of the 34 records screened, 21 were excluded due to the wrong population, including Maternity, Diabetic Ketoacidosis, Diabetic Insipidus, and neonatal and pediatrics. An additional two articles were excluded due to the intervention being out of the scope of the financial ability of the unit. One article could not be accessed in full text; therefore, only ten pieces met the inclusion criteria and were included in this literature review.

Abusoul et al.

Their study found that missed nursing care impacts many patients annually and affects patients' outcomes frequently. Their case study was based in Brisbane, Australia, in a 29-bed inpatient medical-surgical telemetry unit. Data was collected based on both patients' and nursing perceptions of care. A standardized report called MISSEDCARE was created to evaluate charts on the team to analyze missed care. A total of 28 nurses completed the survey, and it was found that monitoring fluid I&O was one of the top missed patient care items (Abusoul et al., 2022).

One impact contributing to missed patient care is inadequate staffing, leading to a higher patient-to-nurse ratio.

Jeyapala

A quality improvement project on an inpatient medical-surgical floor looked at pre- and post-intervention staff surveys and chart audits to determine the depth of the problem. Five measures were assessed at both baseline and post-intervention. These included a nursing staff survey regarding their understanding of fluid balance, which resulted in a mean score of 1.45 out of five; coordination between nurses and providers regarding monitoring at 52% of the time; assessment of the simplicity of completing an I&O chart, which was rated an average of 7.4 out of 10; and the number of charts accurately filled out for fluid balance which was 25.4% (Jeyapala). After reviewing baseline data, it was established to make three improvements to the current workflow to increase I&O documentation accuracy. These interventions included increasing the staff's understanding of fluid balance monitoring, compliance with liquid balance chart entries, and acknowledgment of patients who need fluid balance monitoring (Jeyapala). Three Plan, Do Study Act (PDSA) cycles were completed over twelve weeks. During the first cycle, group education sessions were conducted, including reasons a patient may be ordered I&O monitoring and cumulative balance charting every four hours (Jeyapala). Additional interventions were added in the second and third cycles, which included patient water pitchers that included their total intake allotment for four hours, clearer patient labels to be able to quickly identify which patients on the floor have I&O monitoring, more straightforward fluid balance charting system created and implemented (Jeyapala).

Through all these implementations, it was found that nursing education and knowledge increased from a mean of 1.45 to 2.6 out of five (Jeyapala). The correlation between nursing and

providers with I&O monitoring rose from 52.5% to 77%, making labeling on the patient board more explicit (Jeyapala). The number of unnecessary charts with I&O monitoring ordered decreased from 9.3 to 7.0 (Jeyapala). The new charting system increased the ease and simplicity of charting from 7.4 to 8.1 (Jeyapala). Lastly, the percentage of charts correctly monitoring I&O rose from 25.4% to 28.4% (Jeyapala).

Lim et al.

Lim et al. conducted a randomized trial to review current practices and identify what may or may not work to help increase the accuracy of fluid balance monitoring (Lim et al. 2021). They did so through a retrospective review of random samples, including 2,199 inpatients in acute care hospitals in Singapore. With all 2,199 patients, charts were audited for fluid balance monitoring, clinical indication, accuracy of monitoring, oral intake, intravenous intake, and output recorded (Lim et al.). Of all charts reviewed, 68% were ordered for I&O monitoring, while only 78% were clinically indicated according to the operational definition defined by Lim et al. While assessing documentation accuracy, it was found that only 77% showed accurate monitoring of I&O. Oral and intravenous (IV) intake documentation was in 100% of charts compared to output only documented in 21% of charts (Lim et al.). After analysis of the data, it was found that inappropriate prescribing and inaccuracy of documentation were areas for improvement (Lim et al.).

Madu et al.

Quality of fluid balance monitoring has historically been a frequently overlooked task but is one of the most important to give a complete picture of a patient's health (Madu et al., 2021). Initial observations noted that many charts had inaccurate documentation of I&O, and some even needed documentation, even though the patient had a cup of water in their room during shift

change (Madu et al.). Kettering General Hospital has 540 beds with an annual inpatient admission of 310,000. For this quality improvement initiative, a 40-bed medical-surgical unit was used. Upon acknowledgment of missing data, it was decided to develop a quality improvement project to help increase the accuracy of I&O documentation and monitoring for those patients ordered (Madu et al.). It was found that less than 45% of the charts surveyed had correct I&O charting before the intervention began (Madu et al. Barriers identified included inadequate training, poor communication, technical problems with IV pumps, increased workload due to staff shortages, and poor time management (Madu et al.). Staff were surveyed and found that less than 50% believe they received training on I&O charting (Madu et al.). Forty inpatient charts were audited, and it found that only 25% of charts were accurately charted for I&O's, only 17% included summations, 20% had daily totals and balances that were accurate, 20% had fluid monitoring ordered, 74% of entries were illegible (paper charting), and just 14% of charts had all I&O monitored accurately (Madu et al.).

After the baseline data and staff survey were completed, an educational program was developed to help supplement the original 30-minute pre-employment module required by staff. Five PDSA cycles were completed before finding a proper intervention technique to impact I&O monitoring. PDSA cycle one included one-on-one training for nursing staff, which included measuring output for incontinent patients, converting ounces to milliliters and what amount each cup on the unit holds, and only monitoring fluid balance on those that have it ordered and designating their room with a poster (Madu et al.). The second PDSA cycle incorporated the providers for the unit to be requesting I&O monitoring only for those patients that are clinically indicated. Through processes, three to five scales were added to weigh wet incontinence pads for accurate measuring and involving ambulatory patients to monitor their I&O with simple charts in

their rooms to help alleviate the burden on staff (Madu et al.). After all PDSA cycles were complete, post-intervention data was collected, which showed a 55% increase in charts with I&O accurate monitoring, an 82% increase in the appropriateness of I&O monitoring orders for patients, and a correct daily balance increasing from 45% to 100% of records (Madu et al.).

Vincent and Mahendiran

Vincent and Mahendiran (2015) identified some of the barriers that contribute to the universal problem of inaccurate I&O, including lack of education on the importance of I&Os, difficulty in documenting output for incontinent or confused patients, and time demand (Vincent & Mahendiran, 2015). It is hypothesized that more precise rules and straightforward ways to record I&Os will be more accurate and improve patient outcomes (Vincent & Mahendiran, 2015). In a respiratory unit in a large district general hospital, Vincent and Mahendiran (2015) conducted a quality improvement project with pre- and post-implementation data to compare the intervention's effectiveness. One hundred seventeen patients were included in the baseline audit, which looked at I&O monitoring, clinical relevance for I&O monitoring, chart completion rate, and chart accuracy (Vincent & Mahendiran, 2015). Baseline data revealed that 67% of patients had I&O monitoring, 53% of those patients were clinically indicated to have I&O monitoring, 50% of charts were complete, and only 41% of charts were accurately charted (Vincent & Mahendiran, 2015). Additionally, nurses' and nursing assistants' knowledge and attitudes towards I&O monitoring were surveyed. It was found that 72% of staff believe I&O had been ordered for too many patients and was not always clinically indicated, 91% believe monitoring was continued too long and should be discontinued sooner, 84% think more guidance would be helpful to increase the accuracy of charting I&O's, and 67% feel more education is needed for staff (Vincent & Mahendiran, 2015).

Following the collection of baseline data for patients and staff perceptions, an implementation was designed to indicate orders by doctors or providers to explain that I&O monitoring was essential for a patient. This helped to reduce the number of unnecessary strict I&O-monitored patients while also giving an apparent reason to nurses for the monitoring, which, as a result, helped to show nurses the driving factor behind the order and educated them more about the importance of I&O monitoring to staff (Vincent & Mahendiran, 2015). Additional e-learning modules were required of staff to increase knowledge and education about the significance of I&O monitoring and how to monitor correctly (Vincent & Mahendiran, 2015). Six PDSA cycles were completed, which began in four medical-surgical units. Posters were added to staff common areas to help spread information since an information session could only be planned for some teams. At PDSA three, an e-learning module was developed and released for staff to complete, which received positive feedback. As I&O charting increased after staff education was complete, it was identified that some patients needed to have I & O documented during the days, leading to questions about fluid balance for the night shift staff. Following this feedback, charting was changed to noon-to-noon instead of midnight-to-midnight to help give all nurses responsibility in the I&O monitoring. Additional changes to the electronic medical record (EMR) included functionality to capture IV bolus administration and easy-to-access calculators on the unit with conversions for cups used by patients.

With all PDSA cycles, additions and deletions were made to the I&O monitoring protocol, which led to increased chart compliance (Vincent & Mahendiran, 2015). At the end of three weeks, it was found that 33% of patients were ordered fluid balance monitoring, 3% of these patients were unnecessarily ordered I&O monitoring, 70% of charts were complete, and 61% of these charts were accurate (Vincent & Mahendiran, 2015). Staff were surveyed post-

intervention as well, and it was found that 100% of staff rated the e-learning modules a five out of five, and 96% of staff said the e-learning increased their understanding of the fluid balance and how charting is inaccurate and how negative effects can result from erroneous charting (Vincent & Mahendiran, 2015).

Yang et al.

Yang et al. (2019) conducted a quality improvement project at Taipei Veterans General Hospital, Taiwan, on a 40-bed cardiology unit to assess compliance with fluid balance monitoring for CHF patients and identify barriers that make it more difficult for nurses to document accurately (2019). Clinical observations and monitoring for fluid balance were not appropriately registered, affecting patient safety and quality of care (Yang et al., 2019).

Since the main population investigated was congestive heart failure (CHF), only 12 patients were audited to obtain the baseline data, and 15 nurses were. Yang et al. (2019) utilized the JBI Practice Application of Clinical Evidence System and audited charts using three criteria. Pre- and post-implementation audits were conducted to identify possible improvements to the intervention. When obtaining baseline audit data, Yang et al. (2019) used four criteria based on the Joanna Briggs Institute (JBI) recommendations for fluid balance monitoring: fluid and electrolyte monitoring, daily weights, patient involvement, and staff education. This ensured that charts were not in isolation when assessing fluid balance, fluid balance charts were used with physical assessment findings and electrolyte balance, appropriate patients were involved in tracking their fluid I&O, and staff educated the patient regarding the importance of fluid balance monitoring.

Twelve patient charts were audited initially for two weeks to obtain the baseline data before implementation. It was found that 58% of charts complied with the physical assessment

and electrolyte balance. In contrast, evaluation of fluid balance (criteria 1), 53% of patient charts involved education for the patient regarding fluid balance (measures 2), and 42% of patients were involved in their fluid balance monitoring (standards 3). After obtaining baseline data, self-learning material was given to all staff regarding the importance of fluid monitoring and patient/family education on what is and is not to be charted to monitor fluid balance accurately. Education was given for 13 weeks before obtaining post-implementation data. When reviewing charts after instruction was given to staff, patients, and their families, it was found that charts were compliant with utilizing the physical assessment and electrolyte balance.

In contrast, assessment fluid balance decreased from 58% to 50%, patient charts involved education for the patient regarding fluid balance increased from 52% to 93%, and patients' involvement in their fluid balance monitoring rose from 42% to 58%. Yang et al. showed that involving patients in their care can help improve adherence and incorporate collaboration with their healthcare providers. Overall, the intervention increased all criteria except for one regarding fluid balance monitoring. Additional integration of a nursing system was implemented to help with standards 1, which was shown to increase from 50% to 100% after implementation. Overall, this project successfully improved the nurses' competencies in advancing the integration of fluid balance and assessment in patients with CHF.

Rationale

Fluid balance is essential for patients with a variety of admitting diagnoses, including, though not limited to, heart failure, renal, and pulmonary insufficiencies. According to the National Confidential Enquiry into Patient Outcome and Death (NCEPOD), fluid balance and documentation of I&O are considered a factor in assessing quality patient care while hospitalized

(Lim et al., 2021). Patient care plans and desired outcomes stem from fluid balance and can impact future changes to medications and interventions (Lim et al., 2021).

Within this QI project's focus, fluid balance documentation must be more consistent. Staff report varied workflows for I&O documentation and monitoring. For example, some staff report entering intake once a drink is given, while others register to chart it once it is complete or taken away. An apparent miscommunication was identified in I&O workflows within this unit. Developing a more straightforward way of documentation and expectations of each staff member was needed.

Specific Aims

We aim to improve the accuracy of I&O documentation for patients on a medical-surgical telemetry floor with fluid restriction orders. The process begins with staff education and ends with streamlined I&O cluster sheets for documentation.

Methods

Context

A not-for-profit magnet hospital in New Hampshire aims to partner with both the patients as individuals and the community. One of its medical-surgical telemetry units provides services for medical and surgical patients with telemetry monitoring when indicated. This unit includes eighteen beds and fifteen patient rooms. Most patients are between 55 and 90 years of age, though patients as young as 18 can be admitted. The average length of stay for patients is five days. On average, this unit has approximately three patient deaths per month (5.6 per 1,000 patient days), which may have been slightly elevated during COVID-19. Of the patients admitted to this unit, most diagnoses fall into the following: chronic obstructive pulmonary disease

(COPD) exacerbations, chest pain, stroke, non-ST elevated myocardial infarction (NSTEMI), and congestive heart failure (CHF).

Currently, on this unit, it could not be found if a policy was written regarding fluid restriction patients and expectations for nursing staff. It is known that daily weights are to be done in the mornings on a standing scale if the patient can and that I&O is to be documented every four hours as well. Additional expectations other than these were not found, which may be a factor in the miscommunication of expectations for staff regarding I&O monitoring for fluid restriction patients.

The following intervention mentioned has no associated financial costs, though it is a workflow change for nursing staff. Being able to effectively chart and monitor fluid balance for patients with heart failure can be a simple, worthwhile change. Working with this unit's team to identify areas for improvement identified opportunities to increase charting and monitoring and improve patient outcomes. This can decrease patients' length of stay and financial costs While reducing readmission risk.

Intervention(s)

As noted, this inpatient medical-surgical telemetry unit in New Hampshire frequently sees patients diagnosed with heart failure admitted for fluid overload and a need for diuresis. When these patients are admitted, a standard order from the provider is expected to document and monitor I&O to ensure that fluid is not excess or the patient is over-digressed. The medical intervention of diuretics is most effective with accurate I&O. With the support of staff and upper management, a group of interventions built on one another has been developed.

First, pre-intervention chart audits will be completed to find areas for improvement and gaps in knowledge for nursing staff. Second, educational material will be presented to staff to

review and attest that they have viewed it. This will include the importance of I&O, policy expectations for the team, standard conversions for ounces to milliliters, and the new documentation expectations. After completing education, standardized checklists will be designed to show the required materials for patients admitted with an order, including standing orders and protocols for fluid restriction and strict I&O monitoring. These additional materials will include a charting table (Appendix C) and a conversion chart (Appendix D). Stakeholders included unit registered nurses (RNs), licensed nursing assistants (LNAs), the unit manager, and unit clinical practice leaders. A master's prepared clinical nurse leader served as an advisor.

Study of the Interventions

Once said intervention has begun, it will be evaluated using chart audits and PDSA cycles. Two total PDSA cycles were included in this study. Staff will be aware that these audits will occur. The team will be supplied with educational material, and a reminder of the intervention at shift changes was announced twice daily.

Measures

Operationally, it is understood that intake consists of all fluids a patient is to intake in a twenty-four-hour period, while output consists of excretions from a patient. Both I&O are measured in milliliters. To achieve success for these interventions, staff input and buy-in was essential. Staff was surveyed before to gain valuable attitudes and opinions on I&O monitoring in this unit. These surveys used a Likert scale of one to five. Questions on the survey included if they chart every four hours on I&O, obtain daily weights, feel that I&O and fluid balance as discussed at handoff, and if I&O is essential to staff to monitor and document appropriately. Surveys were given to staff, including an explanation of its use. Responses were anonymous and collected over one week. Out of all 38 employees, 32 completed the survey.

Analysis

Pre-intervention data for staff education, knowledge, and chart audits were collected and utilized to develop the intervention. Chart audits and descriptive statistical analysis were completed throughout the intervention to determine if frequency and percentage increased with nursing documentation. The Gemba chart audit (Appendix A) was conducted for all heart failure patients ordered for fluid restriction.

Ethical Considerations

A formal ethics review included the ethical aspects of implementing and studying the interventions and how they were addressed. It should be revealed that this project's lead was a current employee of Macrosystem Two as a licensed nursing assistant during the planning stages of the process but did not work on this unit during the intervention.

Results

Results

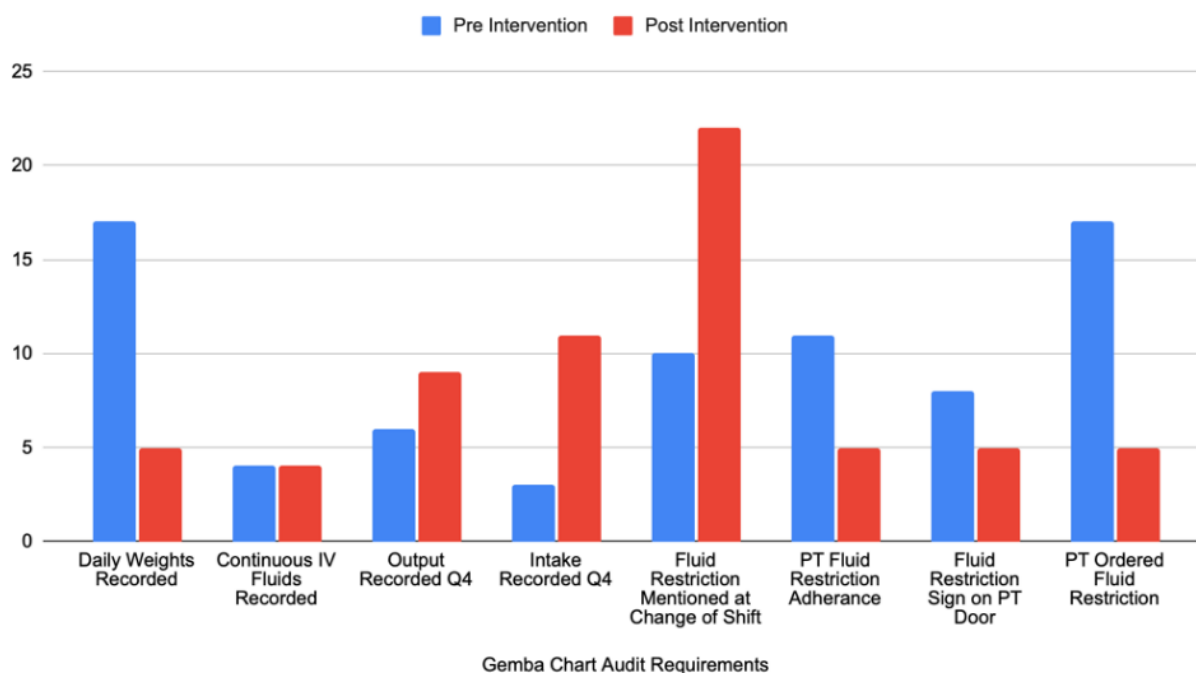
The pre-intervention survey of the staff's opinions and attitudes towards the current practice of I&O charting and monitoring impacted the type of intervention chosen. Additionally, 17 pre-intervention chart audits were completed that showed the following: 88% of charts had daily weights charted, 76% of charts did not have continuous intravenous (IV) fluids charted, 65% did not monitor output every four hours, 82% did not monitor intake every four hours, 52% of patients with strict I&O monitoring were mentioned in reporting, 64.7% of patients adhered to their strict I&O limits, and 52.9% of patients had strict I&O monitoring signage on their doors. This pre-intervention validated the informal nurse reports that communication was lacking in this unit for all nursing staff regarding I&O monitoring. Twenty-eight of thirty-five employees completed a baseline survey regarding their perceptions of I&O charting and their monitoring

practices' accuracy. When asked about the importance of I&O monitoring, all staff reported it was essential.

Over one month, chart audits were completed as staff began to use the cluster I&O sheets. Staff were educated about the sheets at a change of shift report. The project lead completed chart audits on currently admitted patients two times a week at various times. It was discovered through chart audits that no patients with fluid restrictions were admitted to the unit. This lack of data to compare to before the intervention led the researcher to expand the patient population of focus from those with fluid restriction orders to all patients admitted on the floor regardless of diagnoses or fluid restriction. The focus of the data was now to see if the workflow of using I&O cluster sheets helped staff to keep I&O documentation accurate during a patient's stay. Figure 1 below illustrates that pre-intervention data exhibited higher output documentation adherence rates, while post-intervention data showed higher rates of intake documented.

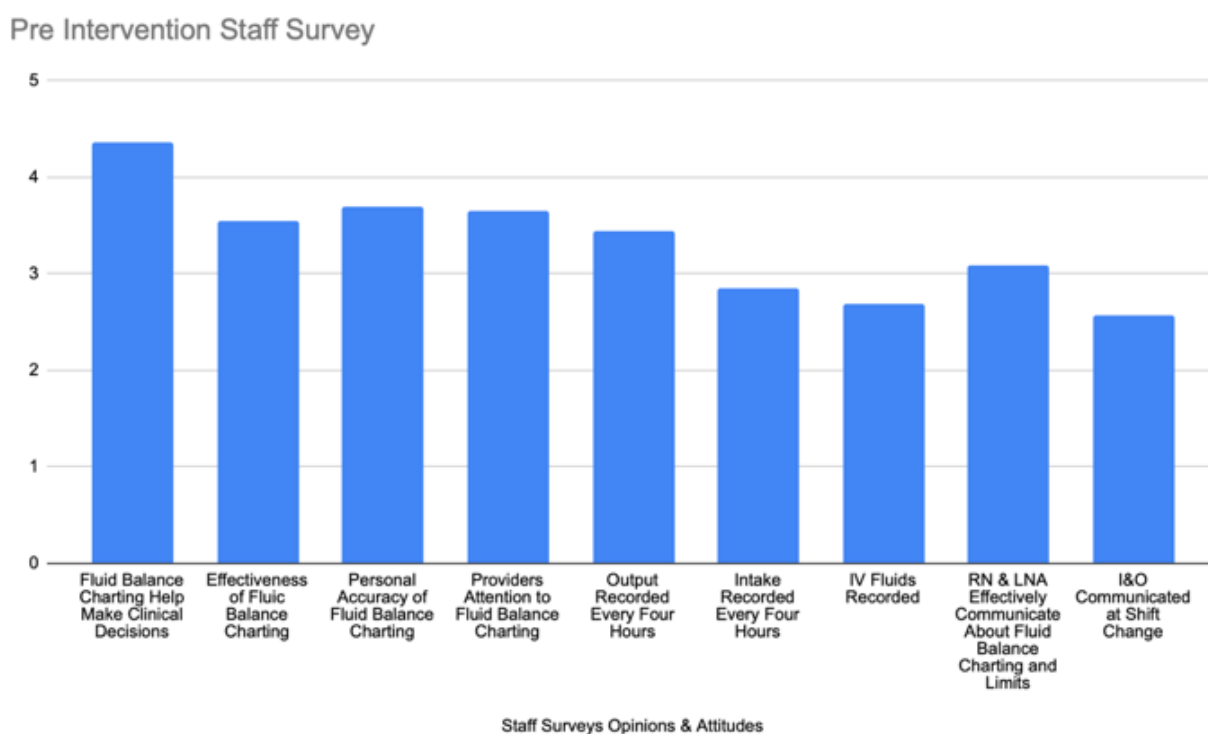
Figure 1

Pre Intervention and Post Intervention Chart Audits



The changes in staff opinions and attitudes toward I&O monitoring can be seen in Figure 2. This data was used to determine the need for a more concrete workflow for staff and was not repeated after the intervention began. Staff were asked to complete a Likert scale from zero to five, five being all the time, of how frequently the following occur on the unit for patients with fluid restriction orders.

Figure 2



Implementations: Initial Steps and Evolution

Staff education and awareness of the interventions were provided two weeks before they began. This included a poster of available knowledge as well as the interventions chosen. Staff were informed of the intervention timeline as well as expectations. Following the sign for the team, implementations included placing the I&O cluster sheets with the fluid restriction door alerts. Staff were reminded through the change of shift announcements of the intervention and where to find the sheets for two weeks. In response to an entire unit census with no active fluid

restriction orders, I&O cluster sheets were included in the care of all patients for the remaining two weeks of data collection to collect an adequate sample size. This change to the intervention and randomized chart audits over two weeks was implemented to determine the efficacy of the I&O cluster sheets.

Missing Data

As mentioned, one significant impact that contributed to the data collection was the lack of patients admitted with fluid restriction orders during this quality improvement work. Though this led to a shift in how data would be collected, it allowed workflow analysis for all patients rather than strictly for patients with fluid restrictions.

Discussion

Summary of Findings

Through pre-intervention data collection, it was identified that staff needed to document I&O for all patients accurately and were consistently missing information to help increase positive patient outcomes. All audited charts pre-intervention contained at least one missing piece of information affecting proper documentation. These missing points were frequently I&O documentation every four hours and fluid restriction signage on the patients' door.

Interpretation

Due to the evolution of the intervention and how data was collected, results were different than expected over the four weeks (two weeks focused on strict patients with fluid restriction and two weeks of expanding to all patients admitted to the floor). Staff on this unit do not typically chart I&O on all patients; the team needed clarification about why this was an expectation. Staff were informed of the reason for the change in workflow temporarily with an announcement that charge nurses read to the team at each change of shift. Before this pilot

project, there was no established method of assuring I&O accuracy for patients with fluid restriction orders. Some contributing factors to this included the absence of a defined workflow and monitoring expectations for staff.

Limitations

During the development of this pilot project, staff expressed excitement for the change and thought it would help to streamline documentation. Through the implementation, it was not received as welcome as once thought. First, the study was conducted in a limited time frame. Data collection was to be completed within a month, and staff education within a few weeks. Many staff on the unit were on vacation throughout the project's implementation stage, which led to miscommunication and translation of expectations. The team received two weeks of education via a poster in the breakroom and announcements in their shift change binder. No formal in-person education was done due to lack of time and scheduling. Additionally, the project lead was only present for two shift changes to inform the clinical staff regarding the change in workflow. This may have resulted in low compliance and should be noted as a limitation to results.

Another limitation is the sample size and data collection. As noted, no patients were admitted with fluid restriction during the first two weeks of data collection, which led to the inclusion of all patients admitted to the unit. While this did afford data collection through increased sample size for post-intervention chart audits, it led to discrepancies in data (list them here)

Throughout data collection, staff were reminded that chart audits would be occurring. This may have increased compliance for the short time they were reminded. Some staff were also familiar with a previous workflow the unit used, similar to the cluster I&O sheets, which may have also increased the accuracy rate.

Lastly, as mentioned before, the project lead was an employee of this hospital during implementation, though not a staff member of this unit. The project lead was a licensed nursing assistant float for the whole hospital per diem and was not assigned to work on this unit during the project. This could have caused limitations in data due to staff needing to be made aware of my role in the organization.

Conclusion

Usefulness of Work

I&O has been shown repeatedly to be a key indicator for patient outcomes and directly impact changes to a patient care plan. Correctly identifying patient outcomes regarding fluid balance while admitted to a medical-surgical floor can support early intervention and promote positive patient outcomes. As seen from the literature, many different settings and organizations need help accurately documenting I&O. This quality improvement study identified that staff would benefit from additional education and transparent workflow regarding I&O monitoring and documentation.

Sustainability

As available research shows, intake and output are common interventions many healthcare facilities need help with compliance. In conclusion, increasing education and a clear policy for patients with fluid restrictions would help increase documentation accuracy. Through this QI project, it was discovered that clear expectations and how I&O was completed by healthcare staff were not regulated and were individualized by each staff member. Some ways to increase education and sustain it for the team include introducing it during orientation for new staff members, having peer-to-peer chart audits monthly, and reminders at staff meetings.

Potential for Spread to Other Contexts

In healthcare organizations, all patient outcomes are documented. This can be as simple as their vital signs to as complex as a wound dressing change. Documentation is essential for the patient and the healthcare organization to monitor care delivery. While this quality improvement project aimed to increase the accuracy of I&O documentation and communication between staff members on an inpatient medical-surgical telemetry unit, the interventions could be replicated in other healthcare settings.

Implications for Practice and Further Study in the Field

A wide variety of staff work on this unit, which includes clinical nurse leaders and clinical practice leaders (CPL). The Clinical Nurse Leader (CNL) aims to evaluate patient outcomes and develop ways to increase care plans. This can be achieved through education and the implementation of quality improvement projects. To continue this work and progress regarding accurate I&O monitoring, the CNL and CPL must work together to implement further organization education. Being able to show the significance to staff of the work they are doing can help to increase compliance. Additionally, developing a clear procedure for healthcare staff to follow and refer to will help to increase positive patient outcomes.

Suggested Next Steps

In conclusion, more work should be done around education and more explicit charting expectations. Research indicates that many organizations need help with I & O documentation and mitigating missing data. While this quality improvement project did not improve accuracy, other studies may be able to. For future quality improvement projects, it is recommended that the project lead be present on the unit daily and for extended amounts of time to ensure that interventions are being utilized and to answer staff questions.

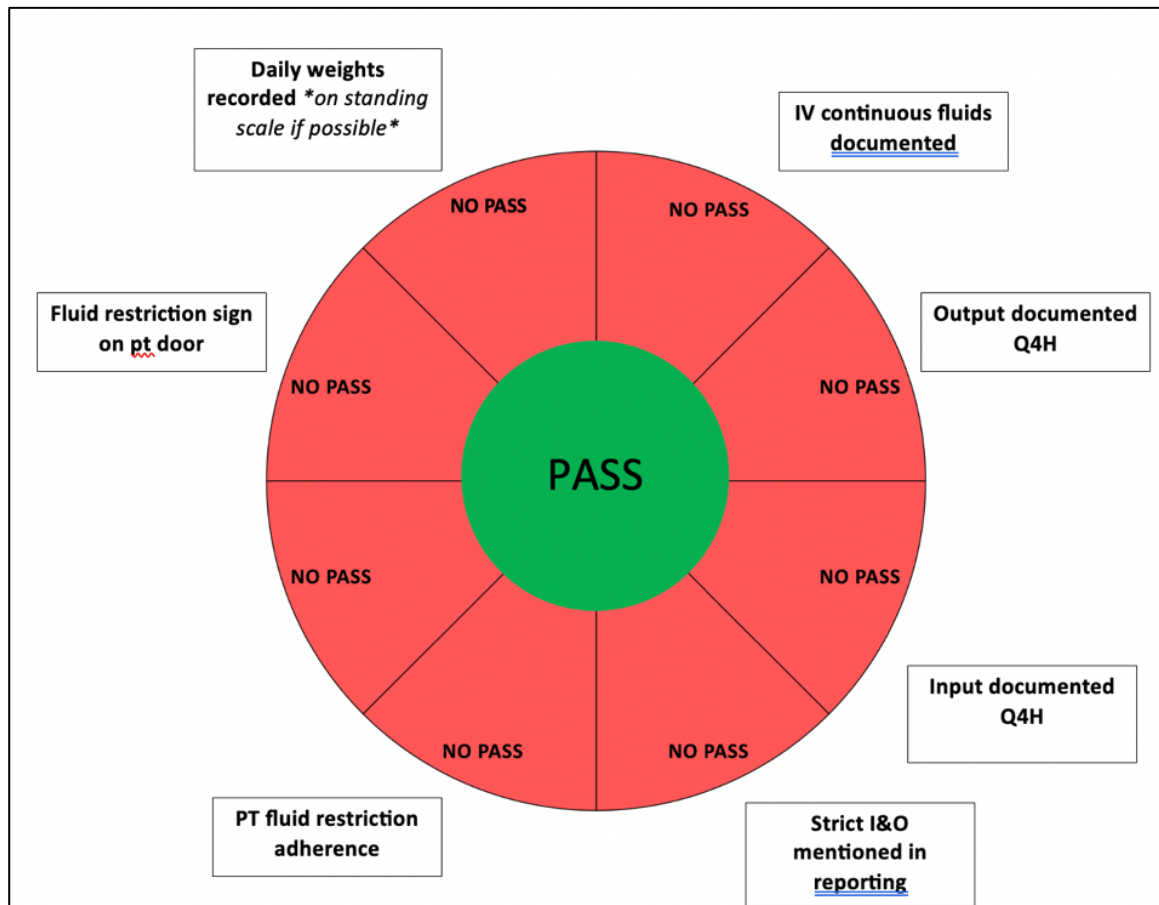
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Appendix A

Gemba Chart Audit Tool



Appendix B

Implementation Stages

Phase 1:

1. Conduct staff surveys regarding current practices, knowledge, and gaps in the I&O documentation system.
2. Conduct chart audits to gain insight to current gaps, strengths, and areas for improvement.
3. Present data to leadership team and develop an implementation plan to improve I&O on 3 West.

Phase 2:

1. Implement I&O improvement plan.
2. Conduct chart audits to see if changes were productive and lead to improved I&O documentation.
3. Conduct a final staff survey to see if knowledge and practices improved.

Appendix C

Strict I&O Worksheet

Time	Intake	Output	Staff Initials Entered in EPIC
0700-1100			
1100-1500			
1500-1900			
Shift Change			
1900-2300			
2300-0300			
0300-0700			

Appendix D*Conversion Table*

Fluid	Milliliters	Ounces
Pepsi Cup	8 oz	240 mL
Coffee/ Teacup (Hard Plastic)	8 oz	240 mL
Coffee/ Teacup (paper)	8 oz	240 mL
Soda cans	8 oz	240 mL
Small paper cup	5 oz	150 mL
Milk Carton	8 oz	240 mL
Ice cream	4 oz	120 mL

Appendix E

Staff I&O Survey Pre- Intervention

	1	2	3	4	5
IMPORTANCE OF STRICT I&O'S	<input type="checkbox"/> Not Important At All	<input type="checkbox"/> Mostly Not Important	<input type="checkbox"/> Neutral	<input type="checkbox"/> Mostly Important	<input type="checkbox"/> Very Important
FBCS HELP ME MAKE CLINICAL DECISIONS	<input type="checkbox"/> Not At All	<input type="checkbox"/> Mostly Do Not Help	<input type="checkbox"/> Neutral	<input type="checkbox"/> Mostly Help	<input type="checkbox"/> All The Time
EFFECTIVENESS OF FBCS	<input type="checkbox"/> Not Effective At All	<input type="checkbox"/> Mostly Not Effective	<input type="checkbox"/> Neutral	<input type="checkbox"/> Mostly Effective	<input type="checkbox"/> Very Effective
PERSONAL ACCURACY OF FBCS	<input type="checkbox"/> Not Accurate At All	<input type="checkbox"/> Mostly Not Accurate	<input type="checkbox"/> Neutral	<input type="checkbox"/> Mostly Accurate	<input type="checkbox"/> Very Accurate
DOCTORS ATTENTION TO FBC'S	<input type="checkbox"/> Doctors Never Look	<input type="checkbox"/> Doctors Mostly Do Not Look	<input type="checkbox"/> Neutral	<input type="checkbox"/> Doctors Mostly Look	<input type="checkbox"/> Doctors Always Look
OUTPUT RECORDED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Output is Never Recorded	Output is Mostly Not Recorded	Neutral	Output is Mostly Recorded	Output is Always Recorded
INTAKE RECORDED	<input type="checkbox"/> Intake is Never Recorded	<input type="checkbox"/> Intake is Mostly Not Recorded	<input type="checkbox"/> Neutral	<input type="checkbox"/> Intake is Mostly Recorded	<input type="checkbox"/> Intake is Always Recorded
IV FLUIDS CHARTED	<input type="checkbox"/> IV Fluids are Never Recorded	<input type="checkbox"/> IV Fluids are Mostly Not Recorded	<input type="checkbox"/> Neutral	<input type="checkbox"/> IV Fluids are Mostly Recorded	<input type="checkbox"/> IV Fluids are Always Recorded
RN & LNA EFFECTIVELY COMMUNICATE FBC & LIMITS	<input type="checkbox"/> Communication regarding FBC is absent	<input type="checkbox"/> Communication regarding FBC is sometimes communicated	<input type="checkbox"/> Neutral	<input type="checkbox"/> Communication regarding FBC is most of the time	<input type="checkbox"/> Communication regarding FBC is all the time
I&O COMMUNICATED AT SHIFT CHANGE	<input type="checkbox"/> I&O is Never communicated at change of shift report	<input type="checkbox"/> I&O is sometimes communicated at change of shift report	<input type="checkbox"/> Neutral	<input type="checkbox"/> I&O is mostly communicated at change of shift report	<input type="checkbox"/> I&O is always communicated at change of shift report

Additional questions or concerns:
