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Intravenous Extravasation Management

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Prospectus Elements 1-10

University of San Francisco

Internship: Clinical Nurse Leader NURS 653

Professor Blais

August 10, 2015

Clinical Leadership Theme

This CNL project focuses on intravenous extravasation management. The CNL role function is outcomes manager. As the CNL on my unit, I will also serve as an educator to the surgical staff. I will be providing an in-service to staff. I will be using data to change practice and improve outcomes of intravenous management on the unit. Achieving optimal client outcomes would be the main goal.

Statement of the Problem

There has been an identified need on the Surgical Unit for intravenous extravasation management. There were a number of reported catheter complications on the Surgical Unit by procedural staff in various departments throughout Huntington Hospital. Intravenous complications were found by the time patients arrive to procedural areas such as surgery and CT Scan. These complications can lead to unnecessary prolonged hospital stays and delays in medical treatment.

Project overview

As the CNL on my unit, my project plan is to provide two in-services to the Surgical Unit staff on current protocols for peripheral intravenous management and extravasation prevention methods. A peripheral IV audit has been created to assess a sample size of 32 patients on the Surgical Unit. This IV audit will serve as a tool to assess compliance with protocols and IV management within my unit. The goal for this project is to reduce intravenous extravasation by 10% on the Surgical Unit by August 17, 2015.

Rationale

The needs assessment shows that the data analysis identifies an approximate of 15% of intravenous catheters were infiltrated by the time patients arrive to surgery. Unit peripheral intravenous audits were performed to assess the number of intravenous infiltrations and causes of these deficiencies. The specific aim is to improve performance on a specific service or program and is a part of usual care. All participants will receive standard of care. The project involves implementation of care practices and interventions that are consensus-based or evidence-based.

After conducting an assessment of my microsystem and taking a closer look at the SWOT analysis and I have identified some strengths and opportunities, as well as potential threats and weaknesses as I further developed my project. The strength of this project would increase patient satisfaction by preventing extravasation injuries while insertion of intravenous catheter is one of the most common procedures in hospitals. The identified weaknesses include nurses with poor compliance with checking IV site every two hours and nurses that are resistant to starting new IVs due to poor IV skills. The opportunities provided to nurses would be the available resources such as the charge and PICC nurse to assist the process of difficult sticks. Some threats such as patients refusing new IVs to be placed can lead patient not receiving proper medical treatment. Preventative measures by identifying early signs of extravasation would prevent further complications and injuries.

Cost Analysis

A cost analysis was conducted of the project. It was entirely cost effective for a graduate student nurse to perform 6 total rounds of IV audits on the unit. Thirty minutes of in-service time was provided to 42 nurses that attended the staff meeting. Multiply 42 nurses with half of a

nurse's salary per hour resulted in the cost of \$1,008.00 from the unit's budget. Infiltration and extravasation consequences can lead to extended hospital stay and impact healthcare costs. An extended one-day stay on the Surgical Unit in a semi-private room would cost \$2,792.80/day and \$3,792.39/day for a semi-private isolation room that uses negative/positive air pressure.

Complications of IV therapy are costly in terms of patient's quality of life, treatment expense, and the possibility of an extended hospital stay. Patient benefit includes increased comfort and increased safety while they are at the hospital. Ultimately, the project value to both the patient and hospital is preventing unnecessary complications that could lead to an extended stay. Preventing adverse outcomes would provide the best treatment and would significantly save costs to the patient and hospital.

Methodology

The objective and expected change would be to decrease intravenous extravasation on the unit. A change theory that will guide my project is Lewin's Change Theory. This theory is most applicable to the development of my CNL project. There are three stages to Lewin's Change Theory, which incorporates unfreezing, moving, and refreezing. Leaders must help others see the need for change, work with others to implement change, evaluate the effect of change, and participate in each of the change process (Grossman, & Valiga, 2013).

According to Lewin's first stage of change is "unfreezing". This refers to people preparing for change and change is needed (Grossman & Valiga, 2013). I will apply the first stage, unfreezing, to increase staff awareness of current IV practice issues that has led to patient complications. Old practice beliefs and behavior will be converted to new practice change

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improvements and hopefully remove status quo. There will be a staff in-service on reviewing extravasation scales and IV protocol for best practice via current literature review.

Stage two, moving, is when people have accepted the need for a change and actually engage in implementing the change (Grossman & Valiga, 2013). Change is initiated at this point and it is important to manage it by empowering staff to let go of old patterns while adapting to new ones. The CNL will continue to support staff by being an available resource to the unit. The CNL will provide answers to questions and enforce suggested practice.

Stage three, refreezing, is when new change is integrated into the system and becomes part of the new norm (Grossman & Valiga, 2013). The CNL will serve as a unit validator and support staff during this phase. Change is then integrated and becomes part of a daily skill. At this last phase, staff can participate with a higher level of confidence and stability. The CNL will continue to perform random weekly audits to ensure change has been successfully implemented.

A CNL competency I can relate my improvement project to is Systems Analyst/Risk Anticipator. This competency participates in systems review to critically evaluate and anticipate risks to client safety to improve quality of client care delivery. I would be able to apply these concepts of change and use them as my driving force to improve patient care.

The actions I am taking to implement my CNL project includes close monitoring on peripheral IV sites via peripheral IV audits. An in-service on IV maintenance and protocols will be provided to staff RNs on the Surgical Unit at two staff meetings for both day shift and night shift on July 17, 2015.

Data collection would consist of the patient sample size of the current 32 inpatients on the Surgical Unit at Huntington Hospital. There will be a random weekly peripheral IV audit for one month to assess for any infiltration or phlebitis. Other variables to evaluate would include whether IV tubing and IV fluids are labeled or outdated. In addition, I would also evaluate the sterility of the IV tubing that are not in use. BD sterile syringe tip caps are to be used to cap all primary and secondary IV tubing.

I will know if my desired goal is reached by performing a last round of audits when it gets closer to the end of August. The target goal of this project is to decrease peripheral IV extravasation by ten percent by August 17, 2015. I can then evaluate whether I need to further provide education.

Data Source/Literature Review

The focus of my study is intravenous audits. I have created an audit tool to assess current practice on IV management on the unit. The audits are appropriate in serving as a unit assessment tool for me to create an educational guide to re-educate staff nurses on IV management protocols. I used my PICO statement to perform a search using resources such as CINAHL and PubMed and EBSCO host through the university website. Six articles with dates from 2009 to 2013 were found through the academic database and were applicable for the literature review on this project.

Al-Benna, S., O'Boyle, C., & Holley, J. (2013) performed qualitative research evaluating complications of venous and arterial catheters. This article discusses evidence based treatment approaches and methods to prevent complications. This will enable practitioners to prevent, recognize, and successfully treat extravasation injuries in adults.

Alekseyev, S., Byrne, M., Carpenter, A., Franker, C., Kidd, C., & Hulton, L. (2012) discusses the recommendations through current research of the roper stabilization of intravenous catheters to avoid movement that occurs at insertion site in this article. Their review study shows that by using securement devices, this intervention will prevent dislodging of the catheter. Results demonstrated IV securement devices decreased complications associated with peripheral IV catheters, and prolonged their longevity and patency.

Avdal, E. Å., & Aydinoglu, N. (2012) discusses in the article, the pathogenesis of extravasation, types, symptoms, and evidence-based management on both vesicant and non-vesicant drugs. Risk factors affecting the formation of extravasation were discussed along with issues related to peripheral and central venous catheters.

Aziz, A. (2009) discusses in this article the care required for peripheral cannulas and shows how implementing the high-impact interventions can improve peripheral intravenous catheter care on insertion and it's management afterwards. Standardization of practice in areas of care where patients are at increased risk of infection can help educe the risk of hospital-acquired infections in patients.

DelPrete, J. S., & Evans, M. M. (2013) discusses in this article the current Center for Disease Control (CDC) of peripheral intravenous catheter management recommendations. The risk and benefits of changing the intravenous catheter site was reviewed. Evidence-based practice adoption of new guidelines would significantly improve patient satisfaction.

Dougherty, L., & Oakley, C. (2011) identifies the risk factors and management of cytotoxic drugs to the limbs of the patients in this article. Implications for practice such as early detection and flush-out technique are the treatment of choice. Training along with applying

technique into practice was positively received by patients, medical staff and chemotherapy nurses.

Timeline

The project began in mid June 2015 and the projected finish date will be August 17, 2015. I will be presenting an in-service to staff nurses on our next two staff meetings on July 13 and July 15, 2015. Three final audits will be randomly performed after the in-services are completed by August 17, 2015.

Expected Results

The expected outcomes I can encounter from the intravenous audits are that there would be lack of IVs being labeled along with IV tubing. During current rounding audits, several nurses shared that the IVs are not being appropriately labeled when they are sent up from the emergency department onto the surgical floor. The expected results after performing my in-service would be to hopefully increase nursing awareness on intravenous management and decrease extravasation incidences by ten percent on the unit.

Nursing Relevance

Extravasation and infiltration are risks of intravenous administration therapy involving unintended leakage of solution around the surrounding tissues. Repercussions range from a minor local irritation to the severity of an amputation. The contribution benefits from this study will increase patient satisfaction by promoting awareness to nursing staff the importance of monitoring IV sites closely to prevent adverse outcomes.

PDSA Cycle

A PDSA cycle was conducted to test change for continuous quality improvement. This has provided me opportunities to examine my ideas while learning what has worked and what doesn't work so I would be able to implement new ideas in order to reach my goal. The first PDSA cycle, I was able to give an in-service to 17 nurses, which turned out to be 34% attendance. My initial goal was just to reach 20% attendance. This was a satisfactory turnout considering the meeting was in the evening. For the second round of the PDSA cycle, there were 25 nurses that attended the meeting. The attendance outcome was 50%. I was pleased with the turnout second time around. I learned from the first meeting, nurses getting off duty were mostly exhausted and was not giving their full attention. For the 2nd cycle and 2nd meeting, a morning meeting was conducted instead and the nurses were awake and engaged. I've learned from completing this PDSA cycle, that there will be nurses that would still stick to their old practices and would be resistant to change. As a CNL, I will incorporate transformation leadership into my nursing practice to empower staff and involve others to increase performance effectiveness.

Summary

The purpose and intention of the project is to increase awareness in the topic of reducing intravenous extravasations. An assessment of my microsystem was completed that helped me identified the unit's need for IV management safety. The problem assessed showed that approximately fifteen percent of intravenous catheters were infiltrated by the time patients arrived to pre-op surgery. The clinical setting took place at Huntington Hospital in Pasadena. This is a level 2-trauma center in the San Gabriel Valley with 625 beds in hospital to

accommodate a diverse patient population. This project took place at a 32-bed in-patient Surgical Unit within the hospital. The method of analysis used for this project involved a pre-audit and post-audit tool to assess for IV compliance safety. There were a total of six rounds of random IV audits that were conducted. Pre in-service data showed infiltration rates were at 4% while other significant variables such as IV tubing not in use remains sterile were under 65% and intact dressing were below 80%. An attendance of 42 nurses to a staff meeting was held to provide education on intravenous protocols. Teaching aid visuals and handouts were distributed to staff for reference. Post in-service audits were used to determine effectiveness of teaching. The implementation results showed a decreased by 2% on IV infiltrations while maintenance on keeping tubing sterile rose to 70%. Intact dressings were above 90% compliance. A success in decreasing in decreasing IV infiltrations and extravasations were reduced by 50%. The evaluation results concluded that the in-service provided to staff RNs showed improvement and will continue to be evaluated in the future. A success in decreasing IV infiltrations and extravasations was reduced by 50%.

Nurses are required to take lead in managing change in their daily clinical practices. Systems thinking helps us anticipate and minimize barriers to change. The success of a quality improvement project entails sustainability and is a necessary component to embed success from the very beginning. It requires having objectives in place and the ability to carry out plans for long term accomplishments. The success of standardization of practice will be in place within time. I am confident that nurses will successfully adapt to change as evidenced based practices shows improvement outcomes for patients. In conclusion, intravenous extravasation

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improvement project has been a successful process throughout. It has met the intended goal, which is to decrease infiltrations and extravasations on the Surgical Unit by 10%.

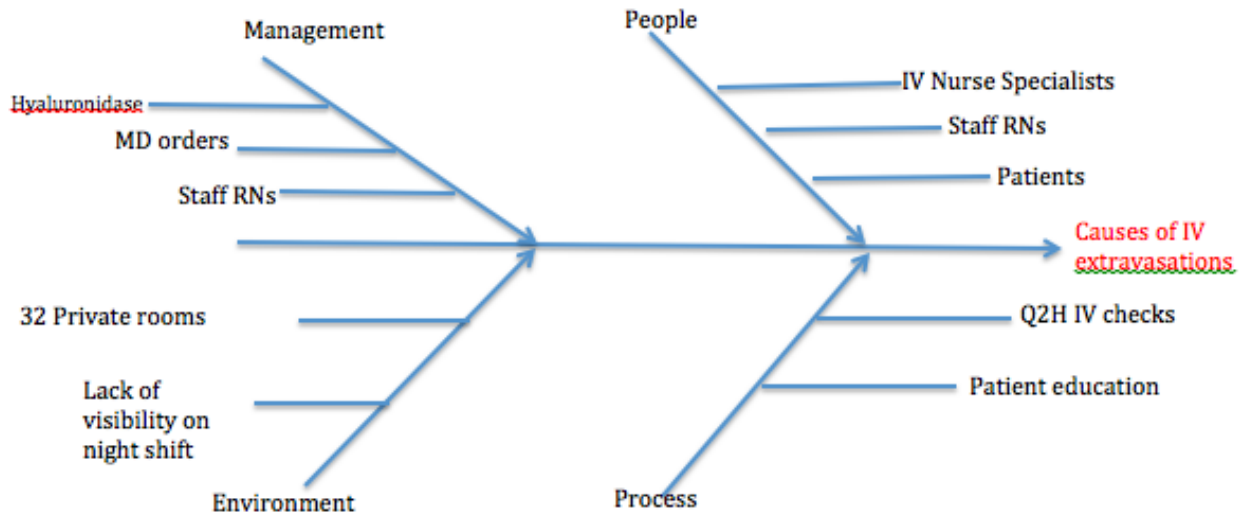
Infiltration and extravasations should never be viewed natural consequences of IV therapy, but preventative measures by implementing strategies to minimize risk would be the best outcome.

References

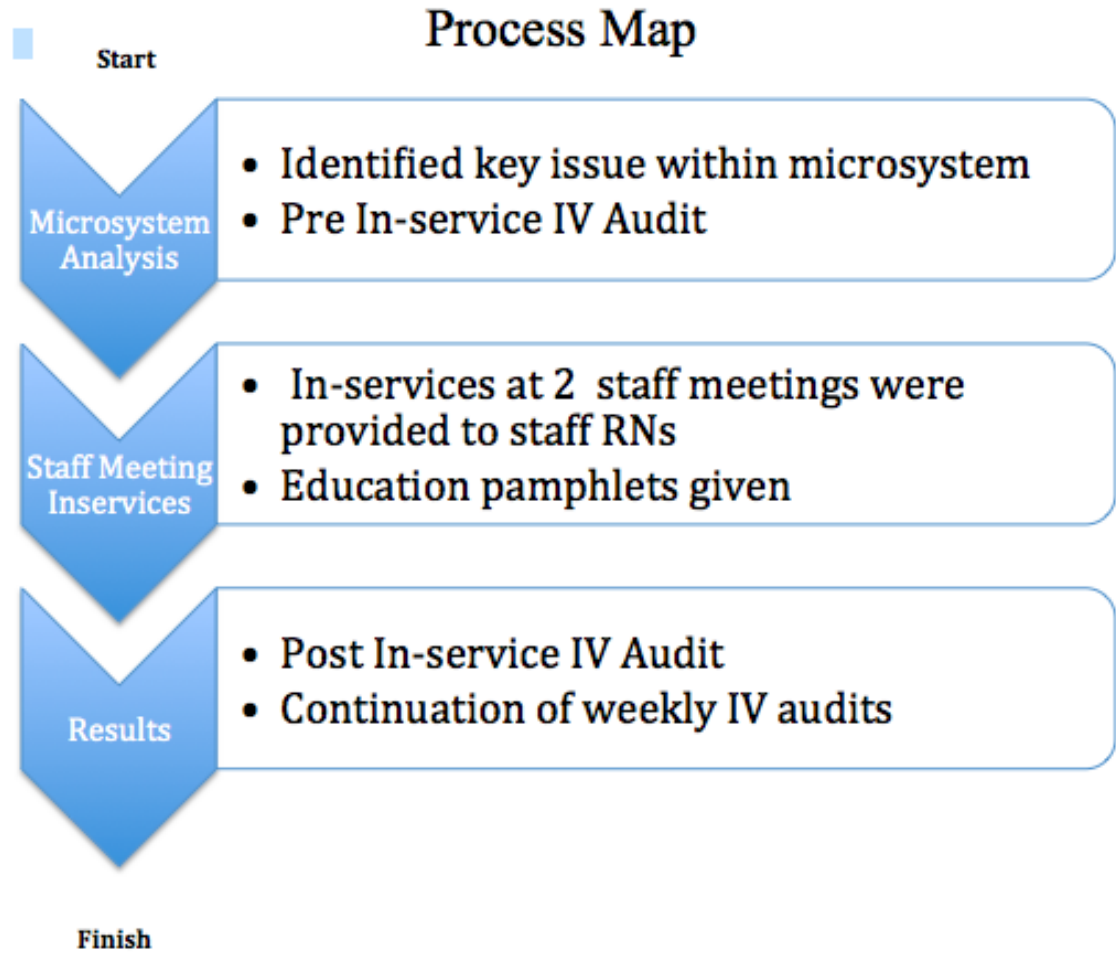
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Appendix A

Root Cause Analysis Fishbone Diagram



Appendix B



Appendix C

SWOT Analysis

Strengths

- Increases patient satisfaction
- Increases awareness & communication
- Have adequate resources (RNs)
- Great teamwork on unit
- Ask for assistance from charge nurses to start new IVs
- PICC nurses to assess

Weaknesses

- *Nurses with poor compliance*
- *Time consuming (Q2H check)*
- *Patients don't want to be disturbed*
- *Resistance to starting new IVs*
- *Poor IV skills*
- *Limited resources on night shift. No IV nurse.*

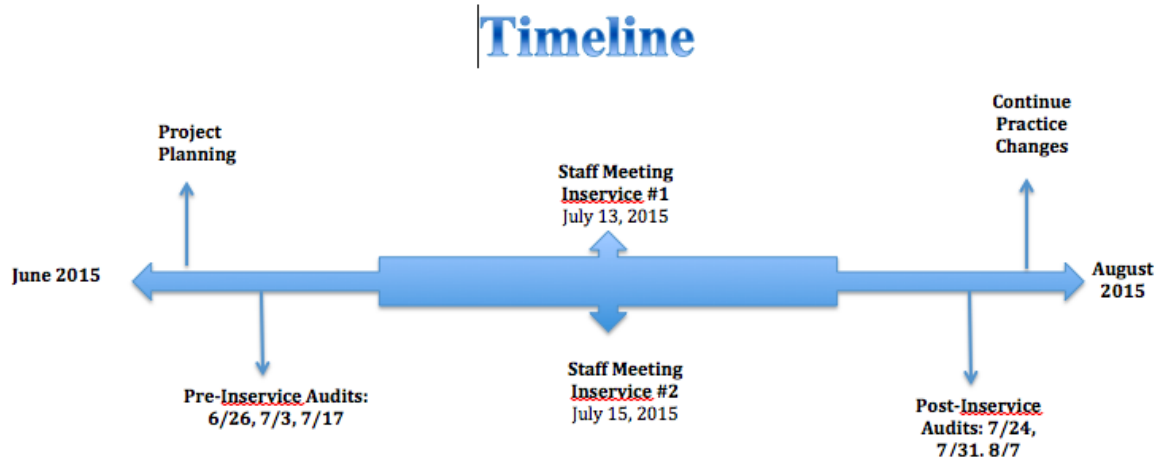
Opportunities

- Involvement/Engagement
- Advocate
- Participate
- Educate
- Investigate
- Commitment to improvement outcomes

Threats

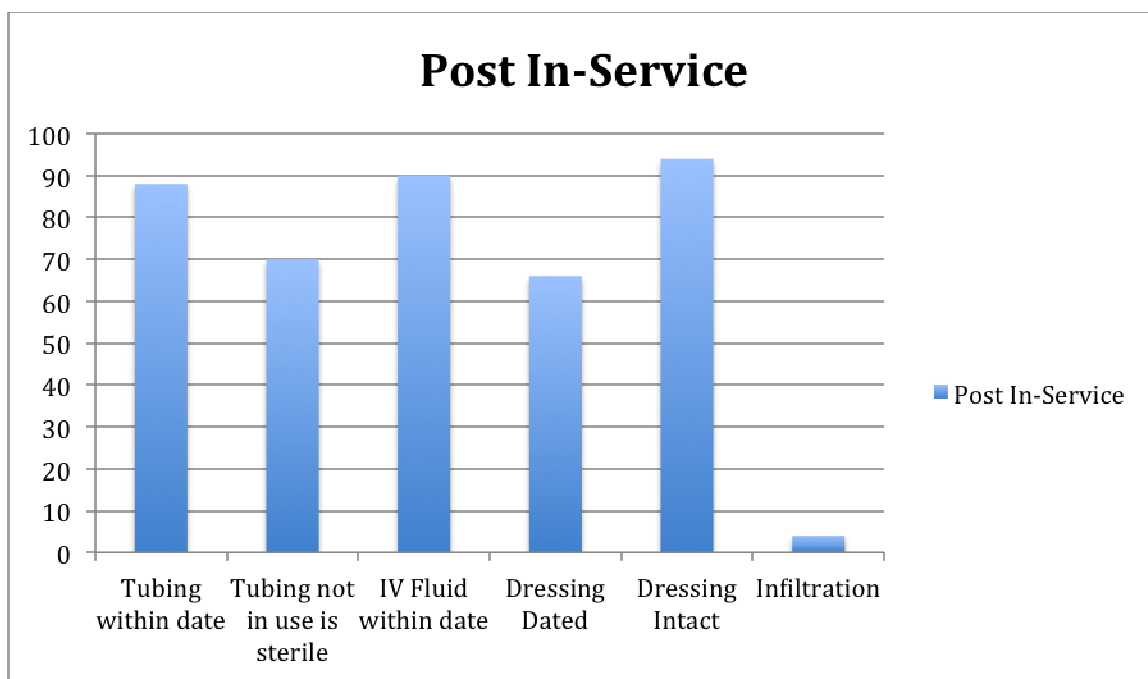
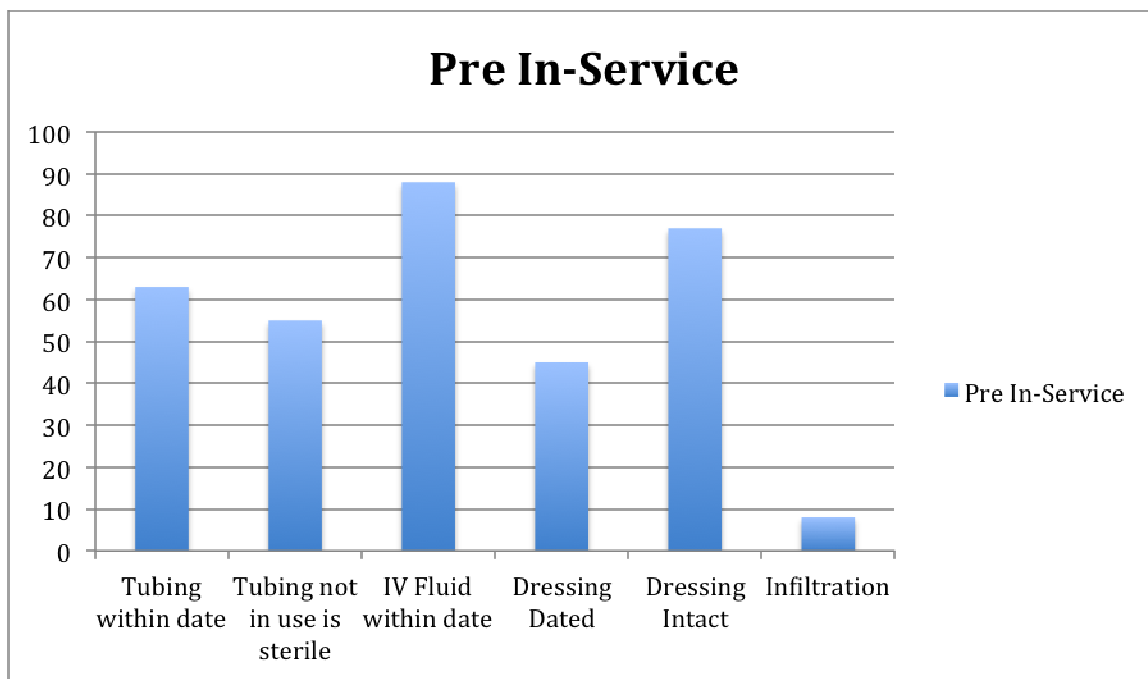
- Conflict of interests
- Patient refusing new Ivs
- Delay of medical treatment
- Prevent further complications and injuries

Appendix D



Appendix E

RESULTS



Appendix F

PDSA CYCLE



Appendix G

PERIPHERAL IV AUDIT SHEET

Date of Audit:
Audit

Peripheral IV

Room #	Tubing within date	Tubing not in use is sterile	IV Fluid within date	Dressing Dated	Dressing Intact	Infiltration	Phlebitis	Infection	Comments

Appendix H

EDUCATIONAL HANDOUT

INFILTRATION SCALE	
GRADE	
0	No Symptoms
1	Skin blanched, edema <1 inch in any direction, cool to touch, with or without pain
2	Skin blanched, edema 1-6 inches in any direction, cool to touch, with or without pain
3	Skin blanched, gross edema >6 inches in any direction, cool to touch, mild-moderate pain, possible numbness
4	Skin Blanched, translucent, skin tight, leaking, skin discolored, bruised, swollen, gross edema > 6 inches in any direction, deep pitting tissue edema, circulatory impairment, moderate-severe pain, Infiltration of any amount of blood product, irritant, or vesicant.



Figure A.



Figure B.

Appendix I
EDUCATIONAL HANDOUT

PHLEBITIS SCALE	
RATING	
0	No Symptoms
1	Erythema at access site, with or without pain
2	Pain at access site with erythema and/or edema
3	Pain at access site with erythema and/or edema, streak formation, palpable venous cord.
4	Pain at access site with erythema and or edema, streak formation, palpable venous cord > 1 inch in length, purulent discharge

Figure A.



Phlebitis & Infiltration images retrieved from Google Images

Appendix J

Nursing Documentation in CERNER.

Determine & Chart PHLEBITIS or INFILTRATION Score

Peripheral IV	
← Left Forearm 18 gauge	
Activity	
Blood Drawn (ED, PICU, IR, Pre-Op ...	
Number of Attempts	
Site Condition	
Drainage Description	
Infiltration Score	
Phlebitis Score	
Care	
Saline Flush 0.45%	ml
Saline Flush 0.9%	ml
Dressing	
Patency	
Equipment	
Response to Activity	



For EXTRAVASATION GO TO

Extravasation Assessment	
Infiltrated Medication	hr
Extravasation location	
Skin observation	
Skin Condition	
Antidote Administration	
Administration per Policy & Procedure	
Additional interventions	
Administration documentation completed	
Extravasation location	
Skin observation	
Skin Condition	
Regitine Administered per STD Procedure	
Nitro Oint Applied	
Additional interventions	
Administration documentation completed	
Extravasation location	
Skin observation	
Skin Condition	
Extravasation occurred 12 hrs or > prior	
Hyaluronidase Admin per STD Procedure	
Additional interventions	

Peripheral IV
Pulmonary Artery Line
Arterial Line
Extravasation Assessment



Applications
Compliance WebLine
Event Reporting (Bee Safe)
h@nk Prod
h@nk Train
h@nk Upgrade Practice Site
myNetLearning
Outlook Web Access (OWA)
Self Service Password Manager
Workers' Compensation
Work Order Request

