

Capstone Change Project

Reducing Vascular Access Device Infection in Cancer Patients Undergoing Intravenous Therapies

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Background of Clinical Problem

In a cancer patient may need long-term IV therapy for chemotherapy, IV fluids, antibiotics and a host of other medications. Concerning CVCs such as PICCs compared to PVCs, many aspects of the management and the complications—mainly infections and thrombosis—depend on the choice of the vascular access. Thus, while central lines can be advantageous in terms of long-term usage, the need for which is the ability to provide a constant and stable venous access, thus preventing frequent attempts for catheterization of this site, the use of these devices is linked to a higher incidence of CRBSIs and thrombotic complications in comparison with peripheral lines. From these complications, patients are likely to develop sepsis, spend more time in the hospital and incur high medical expenses. It is salient to find out that appropriate measures and excellent infection control measures such as the hand washing procedures, sterilization techniques among other standard precautions and also frequent surveillance are crucial in preventing these risks. Optimizing vascular access plan and compliance with infection control measures is vital to advance the patients' well-being, guarantee the effectiveness of chronic therapies, and avoid fatal consequences in cancer treatment. The application of these strategies could enhance patient safety, decrease hospital expenses, and consequently, contribute to better cancer patients' outcome who require long-term IV treatment (Marschall et al., 2014).

Clinical Problem Statement

In cancer patients actively receiving long-term IV therapies, the decision between CVA and PVA is highly related to the occurrence of complications such as infections and thrombosis. Literatures show that although CVAs afford stream entry that is suitable for long-time treatments, these ports expose patients to higher risks of acquiring bloodstream infections and

thrombotic episodes in contrast to PVAs. In the study by Mermel et al (2009), it was noted that central lines placement contributed to development of CLABSI's which are a serious threat to patient safety and effective treatment. This stress the need for protocols when conducting CVAs to ensure incidence of infections are kept to a minimal. Recognising these complications is therefore important in enhancing the vascular access approaches to cancer management so that besides affecting cure delivery the effects are minimised. To minimize the above risks, others strategies like hand washing, use of aseptic practices, and inspection if sites of vascular accesses frequently are recommended. Recognizing the risks and advantages of employing CVAs and PVAs in the healthcare system, more sufficient decisions can be made with aiming to improve patient's condition and decrease deadly complications in oncology patients, who receive long-term IV therapy.

Purpose of the Change Proposal

The aim of this change proposal is attempting to elaborate a coherent plan toward decreasing the rate of complications concerned with the use of the central line, mainly infection and thrombosis among cancer patients who receive long-term intravenous therapies. This proposal focuses on the improvement of patient care through partnering with the best practice, educating patients, and implementing proper infection control measures. Essentials are proper hand wash, use of gloves and other barriers, frequent assessment of the insertion sites, and staff and patients' teaching on signs and potential development of complications. With the help of these measures, it is possible to achieve better care for the patient, the reduction of the mortality rate, the number of days spent in a hospital and the expenditures on health care. This approach will also entail teamwork to ensure that guidelines and protocols that are being used are standard, patient-centered, and evidence based. Finally, the goal of this strategy is to promote patient

improvements in the contemporary healthcare environment and increase the safety of cancer patients during their therapy. Thus, this proposal centered on the approach at limiting infections and thrombosis aims to improve cancer patient care through improving the delivery of intravenous therapies, reducing the incidence of adverse events, and ultimately improving the quality of care.

PICOT Question

PICOT Question: In cancer patients requiring long-term intravenous therapies or frequent infusions (P), how does the increased utilization of central lines and accessing them (I) compared to standard peripheral venous access or adhering to strict infection prevention strategies if using vascular access devices (C) affect the incidence of complications such as infection rates or thrombosis (O) within the duration of infusion therapy (T)?

Literature Review Strategy Employed

Concerning the literature search, the following databases were employed, and an appropriate approach was used to increase the possibility of including relevant and quality research. The databases used were PubMed, CINAHL and the Cochrane library. These databases were chosen because they cover a broad range of medical and nursing related studies. To search for specific articles, basic keywords were used such as “cancer patients,” “central venous catheters,” “peripheral venous access,” “infections,” “thrombosis,” and “complication”. The AND and OR operators were used for stringers or expanders depending on the results obtained so that all the possibly existing papers could be located. The literature search was limited to the articles that were published in last five years to include only the updated and related data available in the literature. Selection criteria were set in order not to include researches that dealt

with child cancer patients or cancer patients that are not undergoing long-term intravenous therapy in most of the cases, although some pediatric studies were included also. To perform comparative analyses of CVA and PVA and to provide information on the complications including infection and thrombosis, the required studies had been identified. In the first phase, the retrieved articles were evaluated for relevance on the bases of their titles and abstracts. The identified articles were then appraised further based on the quality, research method, and correspondence to the formulated PICOT question. It made certain that the selected literature gave strong supporting evidence to the change strategy. All the articles collected using this approach contribute to the establishment of a best practice guideline, based on the experiences of other researchers who have designed EBI interventions that help in the identification of factors that may interfere with vascular access in cancer patients, with the goal of reducing complication rates and of improving the quality of the patients' care.

Synthesis of Literature Review

To the best of the patient's knowledge, what are the research questions for this systematic review: In the case of patients who need long-term parenteral therapies or multiple infusions associated with cancer, whether the practice involving the use of the central lines and accessing them (I) compared to the conventional venipuncture of the peripheral veins or compliance with strict measures of infection control should be used when using vascular access devices (C) is related to complications such as infections or thrombosis (O) in the course of long-term intravenous therapies may The decision as to which of the C Liners or PVAs to use is crucial, because and since these options point at different threats to the patients, and different impact on the treatment outcomes. The main goal of the present literature review is to discuss the impact of

the central line on complications concerning infection rate and thrombosis where pva and tight infection precautions are considered.

The Overview of the Multiple Sclerosis, the Aim of the Studies

The purpose of those investigation is to assess the utility of decreasing the complication involved in intravenous catheter use in patients with Cancer and critical conditions to enhance the quality of care provided to the patients. Abrams et al. (2016) provided guidelines concerning outcome data for the management of chronic wounds and Tosh et al. (2017) provided guidelines in infection prevention and control measures as well as institutional protocol for managing combat related trauma was given by Murray et al. (2017) while Chopra et al. (2016) provided strategies in the use of catheter to prevent complications. Patel et al. (2019) included an assessment and a systematic meta-analysis of the hazards and consequences of CV and PIVC participation in cancer treatment Kamboj et al. (2019) provided a review of literature concerning lack of CLABSI in cancer patients. A meta-analysis was conducted by Chopra et al. (2017) to investigate the rate of VTE concerning different types of catheters While, Marschall et al. (2014) have actually proposed the updated guidelines for the prevention of CLABSI in Acute Care setting based on the same. Ullman et al. , (2017) focused on Dressings and securement devices and failure of the catheter while, Marsteller et al. , (2014) Develop and implement interventions to study the reduce of CLABIS in Intensive Care Unit.

As a part of non probabilitative technique, this research involves comparison of sample populations.

The patient populations in the eight studies are dissimilar, firstly due to the setting, then due to the patients and their families' engagement in the studies included. Murray et al. , (2017) majorly

focused on the combat-associated injuries to the extremities, but their review had a restricted sample population since it was a systematic review. Chopra et al. (2016) also only utilized a panel of multispecialty healthcare professionals to develop the catheter use guidelines and not the patient population. The current systematic review and meta-analysis was conducted by Patel et al. (2019) with the objective of including different studies related to cancer patients receiving systemic therapy through CVS or PIVC. Kamboj et al. (2019) carried out the research to find out the inspected medical literature regarding the given type of cancer patients at risk of CLABSIs and, in this context, did not describe any population sample. Chopra et al. , developed a study with the objective of conducting a systemic review and meta-analysis of the literature out of which some of the patients had either PICCs or other CVCs. Marschall et al. (2014) outlined the evidence and guidelines available that has been created with regard to CLABSI prevention in acute care hospitals hence it cannot be regarded as patient population specific.

An Analysis of the Conclusion made in the Different Studies

While developing the outcomes of the outlined eight studies, it is possible to define several patterns of inference: First of all, it is possible to mark that the issue concerning the selection of the catheter and its management stays vital in practice. Several studies target distinguishing CVCs and PVCs to lower the risks of infection and other adversities hold adequate credibility. Infection prevention and control is another noticeable topic, which can be regarded as rather crucial in fast growing disciplines. Some of the analysed publications consider the question of reduction of central line-associated bloodstream infections or CLABSIs, as in the case with authors who emphasize the importance of following the guidelines and best practices regarding the prevention of the infection. Again, it is possible to identify guideline development and implementation as critical to the characteristics of care. It also reveals that it is free to admit that

development of such standardized measures may enhance the concept of patient care because the set standards are much beneficial for the healthcare providers.

Larger outcome of quality enhancement interventions is ascertained for demonstrating the improvement in the results covering a number of infection control issues and overall hospital care delivery in the context of the sampled hospitals. In this context, the importance of carrying out the assessments by relying to some professional opinions and scientifically sound practices is underlined as many researches carry out the synthesis of the accumulating evidence with the aim of achieving the optimum decision making.

It is also vital to indicate that some of the issues arise with certain limitations that can be noticed in the studies analyzed in the present review. Several works faced problems related to sample size, and it contributed to the limitation of generalizing the results of the study onto the general population or over the overall population. The type of the study and the design of the included studies are also inconsistent, which is quite compromising, especially when historical data were used in the analysis, thus rendering the conclusions made thereon invalid. Nonetheless, comparing the results of different studies becomes a difficult task because of the dissimilarities in patients' characteristics and in specifics of different healthcare systems around the world. Many of the researches lacked enough follow-up and, thus, the damaging impact could interfere with the assessment of the sustainability of the offered programs and therapies. Burden of infection seems to be another confounding element in comparing the results and the precise definition of specified complications among the trials (Patel et al., 2019).

Applicable Change or Nursing Theory Utilized

The applicable change theory for this project is Lewin's Change Management Model, which involves three stages: include the three stages which are unfreezing, change and refreezing. It also is appropriate for using to introduce newly developed infection prevention and control measures as well as vascular access procedures and guidelines. The unfreezing stage focuses on alerting the firm to the high complication rates that are likely to be experienced with the current practices. Hence, it emphasizes on health care staff education, the provision of new work procedures and revised guidelines. Refreezing is a guarantee that such practices are integrated into the organization's practices and observed for compliance as well as the results attained. Furthermore, the key components of the nursing theory developed by Florence Nightingale, especially, the significance of the contaminated and secure place for patients in the method of the intervention is scene. The following is a suggested Implementation Plan for migration policies together with the Outcome Measures expected to be achieved.

Implementation Plan:

Training and Education: Organize awareness programs for employees and medical personnel in health care facilities on ICP, correct insertion, and application of central lines as wells as aseptic procedures.

Protocol Development: Create and enforce procedures concerning the insertion, management, and surveillance of central lines including; handwashing, skin preparation, and dressing.

Monitoring and Surveillance: Develop a surveillance program for this organization to check the incidence density, and complications associated with central line. Conduct compliance checks on procedures ad followed periodically.

Patient Education: Teach patients and their families/staff members about signs of infection, as well as measures regarding central lines (Ullman et al., 2017).

Outcome Measures:

- Primary Outcomes: Lessen the incidence of CRBSI, lesser throttling occurrence, and minimize other complications that come together with the use of central lines.
- Secondary Outcomes: Better patient satisfaction, shorter hospitalization rates, and less expenses on the overall health care.

Plan for Evaluating the Proposed Nursing Intervention

[Portion of text redacted]

Assessment of Barrier to Plan Implementation

Potential Barriers:

- Resistance to Change: These might include; Healthcare staff may not embrace new changes in clinical practice.
- Resource Constraints: Lack of available funding to provides appropriate training, surveillance, and for the adequate provision of new protocols.
- Compliance Issues: Enforcing compliance with the protocols to all the staff members serving within the hospital facility.

Strategies to Overcome Barriers:

- Engagement and Communication: The third step is to communicate with the staff, listening to their complaints and creating their involvement in the change process.

- Resource Allocation: Organize sufficient funds and other logistical aspects from the hospital management and administration for the proper functioning of the project.
- Monitoring and Feedback: Implement correct surveillance and give detailed reports to the personnel, stressing the need to follow the guidelines and rewarding conformity.

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Appendix Section

Project Objective (Goal)	Measurable Project Outcome	What data will be collected to measure this outcome?		Who will be responsible for collecting data?
		What tool will be used to collect the data?		
Improve	Achieve 95%	Compliance	Compliance	Infection

Project Objective (Goal)	Measurable Project Outcome	What data will be collected to measure this outcome?	What tool will be used to collect the data?	Who will be responsible for collecting data?
Staff Compliance with Infection Control Protocols	compliance with infection control protocols within 6 months	rates with hand hygiene and vascular access protocols	checklists and observation reports	Control Nurse
	- Number of training sessions attended by staff - Incidents of protocol breaches	- Attendance records from training sessions - Incident reporting system	- Training Coordinator - Quality Improvement Team	
Reduce Infection Rates Associated	Decrease infection rates by 30% within 12	Infection rates before and after implementation of interventions	Electronic Health Records (EHR) system for infection	Infection Control Nurse

Project Objective (Goal)	Measurable Project Outcome	What data will be collected to measure this outcome?	What tool will be used to collect the data?	Who will be responsible for collecting data?
with Vascular Access Devices Enhance Patient Education on Infection Prevention	months • Types and severity of infections 80% of patients report understanding infection prevention measures	• Infection surveillance software Patient feedback survey responses	rates • IT Department Patient satisfaction surveys	Patient Education Coordinator
Increase Use of Advanced Securement Devices for Vascular Access	• Number of educational materials distributed • 90% of vascular access procedures use advanced	• Distribution logs for educational materials • Usage rates of advanced securement devices • Staff feedback	• Inventory management system • Nursing Supervisor	Supply Chain Manager

Project Objective (Goal)	Measurable Project Outcome	What data will be collected to measure this outcome?	What tool will be used to collect the data?	Who will be responsible for collecting data?
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securement forms

devices within

9 months

- Feedback