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"No Harm No Error"- Peripheral Venous Catheter Care

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ABSTRACT: Peripheral intravenous catheters are quiet common in the health care industry and a regular concern of the patients regarding its maintenance and complications. Loss of catheter patency is the most common problem associated with intravenous catheters. The objectives of the projects were to reduce PIVC-related complications with best practice guidelines, to provide the best clinical care standard on peripheral intravenous lines and strengthening of the IV nurse/team in all the units, evidence based clinical assessment of PIVC site and function and reporting of complications to facilitate benchmarking and drive quality improvement and to enhance safe and patent vascular access for the delivery of treatment. The implementation of the project done in pre, intra and post Intervention phases were the pre and post phases were audits and assessments and the intra phase was interventions which includes trainings, strengthening of the assessment and documentation systems and the process modifications. The campaign was a great success in terms of imparting knowledge and awareness among the nurses and strengthening the prophylactic assessment and documentation. The campaign concluded with a systematic sustainment plan that including at least one training on the topic per month, hands-on training on quarter basis, continuation of audits and usage of uniform cannulation tray and on-job trainings by the cannulation team.

KEY WORDS: Error, Cannulation, PIVC, Venous Catheter

I. INTRODUCTION

The continuous voyage towards patient safety has grabbed some real success, yet the zero error goal is still in dreams or somewhat achieving through the tremendous, untiring and comprehensive effort by the entire health care teams. Potent, systematic and progressively increasing, innovative approaches need to be a culture of health care organizations to achieve 'No Harm to the patients and No Errors in the system'.

II. BACKGROUND

Intravenous catheters are the quiet often used invasive device in the hospitals. It is difficult to find out a patient without peripheral venous catheter in the inpatient area. As per literature 60% to 90% of all hospitalized patients
requiring a PIVC. Peripheral vein cannulation is commonly performed for rapid and accurate administration of medications.
Loss of catheter patency is the most common problem associated with intravenous catheters. Phlebitis is one of the commonest complications that develop after intravenous catheter application. Literature says that phlebitis occurred in 13-56% of inpatients with peripheral catheter (1). It is important to assess and identify the peripheral catheter complications in order to prevent and manage them respectively. Cannula Related Blood Stream infections are identified as a complication of Phlebitis which can further lead to sepsis (2).
The incident reporting followed by route cause analysis and corrective and preventive action is significant to understand and prevent the complications and improve the safety of patients having peripheral cannula. In the financial year 2022-2023 only one incident (Extravasation) had reported in relation to peripheral cannulas. It is not meaningful that in a hospital with high footfall, the number of phlebitis or related cannula complications are less. It can be either lack of awareness or under reporting. The supportive documentation of VIP scoring was also lacking in areas other than oncology departments.
'No Harm No Error' projects were implemented, even before in the hospital, based on timely requirement. The area of campaign was decided to Peripheral Venous Catheter Care to create awareness among the nurses and prevent the cannula related injuries and complications to the patients.

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III. METHODS

The strategy adapted for the achievement of objectives was Campaign. The implementation of the campaign was done from November to December in the year 2022. The aims and objectives were;

1. To reduce PIVC-related complications with best practice guidelines
2. To provide the best clinical care standard on peripheral intravenous lines and strengthening of the IV nurse/team in all the units.
3. Evidence based clinical assessment of PIVC site and function and reporting of complications to facilitate benchmarking and drive quality improvement.
4. To enhance safe and patent vascular access for the delivery of treatment.

The major focus of the campaign was on strengthening the daily monitoring of IV line and identifying the complications of IV Line.

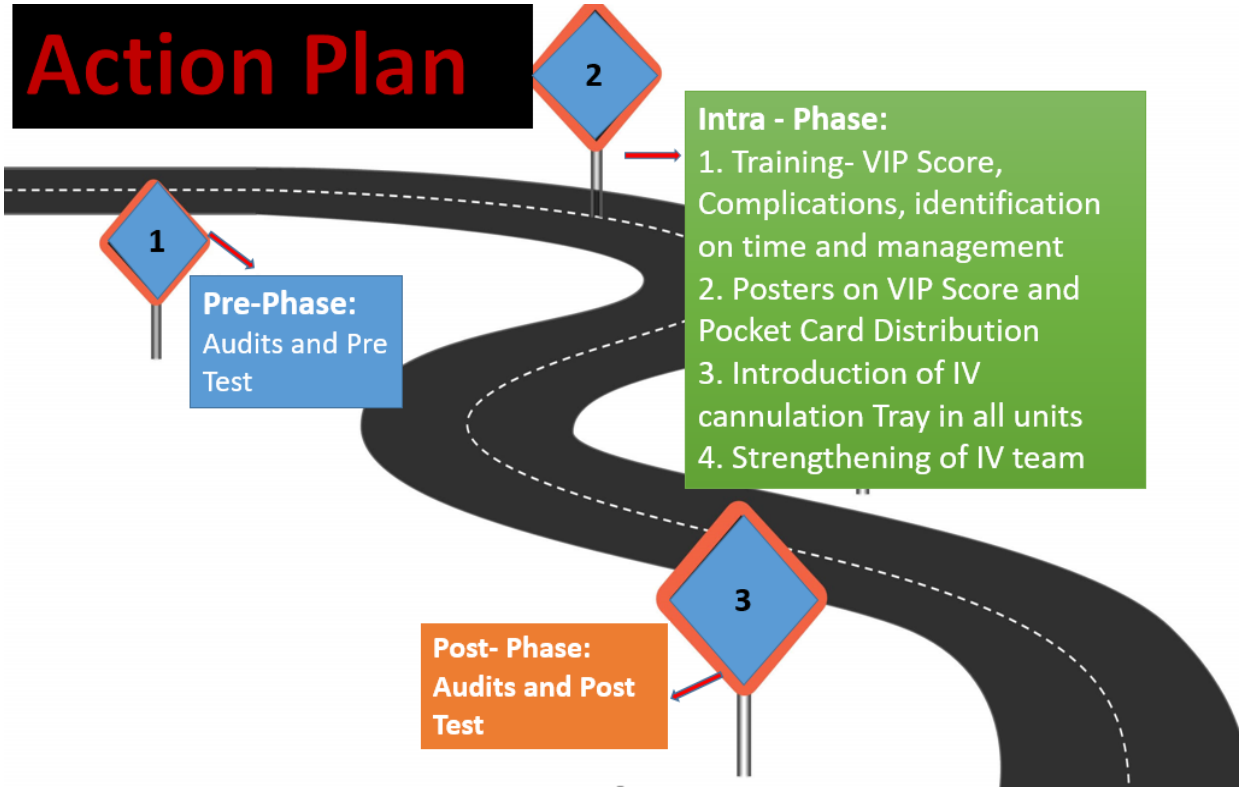

Figure 1: Action Plan for the campaign

The campaign took place in three phases. During the first and last phase, tests and audits were conducted. The actual implementation of the campaign was done during the second phase.

Pre- Phase

Pre-Phase of the campaign had conducted from 20th November 2022 to 28th November 2022. In this phase the awareness of the nursing professionals checked with a structured multiple choice questionnaire. The test conducted by online platform. The link of the questionnaire shared to the staff and asked to fill and submit the forms in front of the examiner. There were five questions and the total score was five. The average score was 2.04 from a sample size of 324 nurses selected by convenience sampling. The entire hospital departments were divided under seven examiners and the participation from each unit including critical care areas were ensured.

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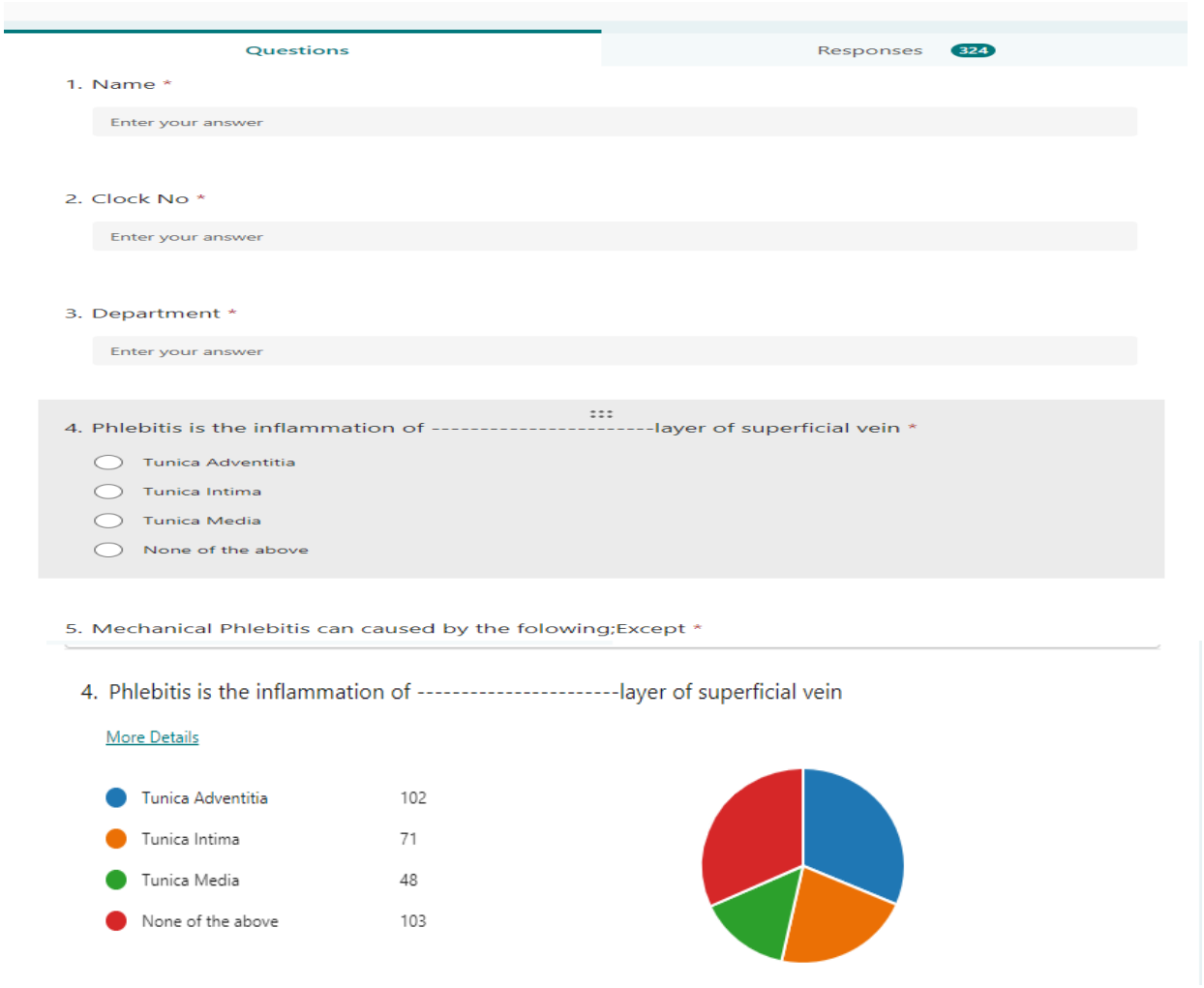

Figure 2: Questionnaire in Microsoft office teams along with scoring criteria

An audit also was done by seven custodians in the hospital departments with a structured checklist during pre-phase. The check points and observations are depicted in the below table.

Table 1: Audit Observations during Pre-Phase

Observations	Score
VIP Score followed in each shift	0
Early Signs observed • Pain • Swelling • Redness • Dislodgement	39 23 10 2 2
Compliance on Transparent dressing	100%
Labelling with date and time	48.75%
Average IV Cannula days	2.57
Reasons for Re-cannulation • Early Signs and Symptoms • Infiltration • Phlebitis • Others	 38 11 2 28

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Cannulation team was also doing their tracking. In the month of November 3067 cannulations were done by the team with a self-prepared cannulation tray which was not identical. Out of 3067, 2130 were new admission, 15 due to infiltration and three were due to phlebitis. Five occlusion cases were there and 914 cannulations done due to the presence of early warning signs.

Intra Phase

The data collected by the audit custodians and cannulation team revealed incidence of phlebitis, which was not escalated or reported in the AIRS (Apollo Incidence Reporting System). The campaign more focused on identification and reporting of IV Cannula complications during the second phase (Intra Phase), which was conducted from 29th November 2022 to 10th December 2022.

Strengthening of the IV Team

The concept of IV Team introduced and implemented in the year of 2014 in Indraprasta Apollo Hospital. While the time as a part of the campaign we strengthened the cannulation team by giving more trainings and privileges to train others (TOT), modified the manpower and strengthened the duty roster.

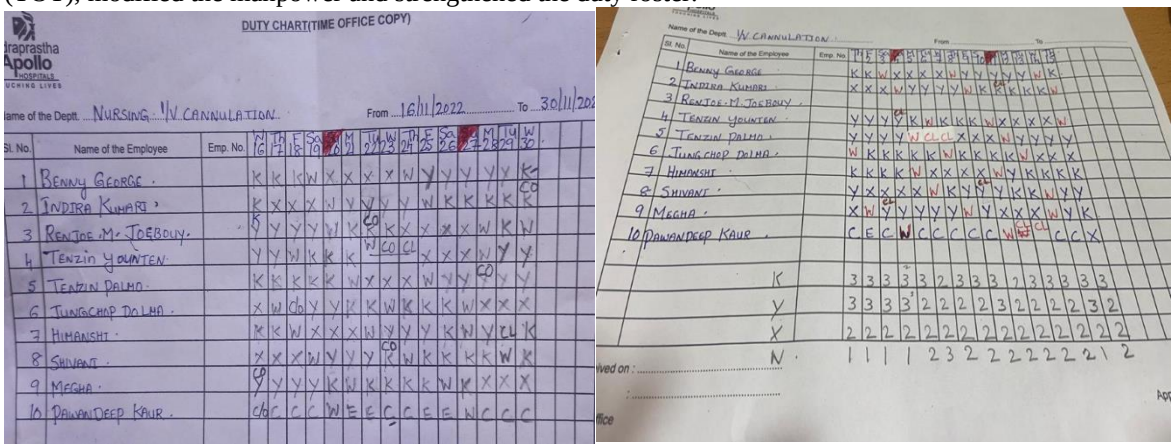

Figure 3: Duty roster of IV team for a month

Introduction of Uniform IV Cannulation Tray

Even though different departments were using an IV tray, it was not uniform. Introduced an IV Cannulation tray as a campaign initiative in each and every department which including Clave Connector/ IV Extension, IV Advanced kit, Vein detector (Optional), Pre-filled syringe flush, IV Cannula and Gloves. The cannulation team verbalised that the implementation of the uniform IV tray made their job easier and less time consuming.


Figure 4: Uniform IV Cannulation tray implemented during intra phase of the campaign

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Distribution of VIP Score Posters and Pocket Cards

Visual cues help us to recollect and incorporate the things rather than only listening. At this stage of the campaign, before starting the reinforcement trainings the custodian distributed the VIP score posters and pocket cards to the nursing departments and nurses respectively. The posters placed in the notice boards so that each time it will remind the nurses about the importance of the VIP score monitoring and documentation.

Figure 5: Images of VIP score card and poster distribution

Reinforcement Trainings

The outcome-based trainings given on techniques of IV cannulation, VIP Scoring, Complications of IV Cannulation, Identification and management of IV Complications. The Cannulation techniques were hands on practices with the help of IV arm. Emphasised each nurse to follow the VIP score in the nurse's notes and identify the differences between the phlebitis, Thrombophlebitis, infiltration and Extravasation.

Figure 6: Images of re-inforcement trainings

Post-Phase

The post- phase of the campaign had conducted from 15 December 2022 to 28 December 2022. During this phase the custodians conducted the audits on the same points and post- test also obtained from the nurses to assess the effectiveness of the training programs and to find out the knowledge gain compared to the pre-test.
The findings of the audit report are shown in the below table

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Table 2: Audit Observations during Post-Phase

Observations	Score
VIP Score followed in each shift	147
Early Signs observed • Pain • Swelling • Redness • Dislodgement	20 6 6 8 0
Compliance on Transparent dressing	219
Labelling with date and time	70.91%
Average IV Cannula days	2.22
Reasons for Re-cannulation • Early Signs and Symptoms • Infiltration • Phlebitis • Others	 44 0 0 13

The cannulation team also maintained their tracker. In the month of December 2425 cannulations were done by the team with a uniform cannulation tray which was identical in all the units. Out of this, 2169 were new admission, 12 due to infiltration and one was due to phlebitis. Eight occlusion cases were there and 235 cannulations done due to the presence of early warning signs. The VIP score and nursing documentation were done in majority of the cases.

IV. RESULTS

Significant difference was evident in the pre and post audits as well as in the knowledge score between both the pre and post phases of the campaign. The cannulation team also stated that it was really comfortable for them to do cannulate the patients with a pre prepared IV cannulation tray that equipped with uniform articles.
The comparison of pre and post audits were given in the below images.

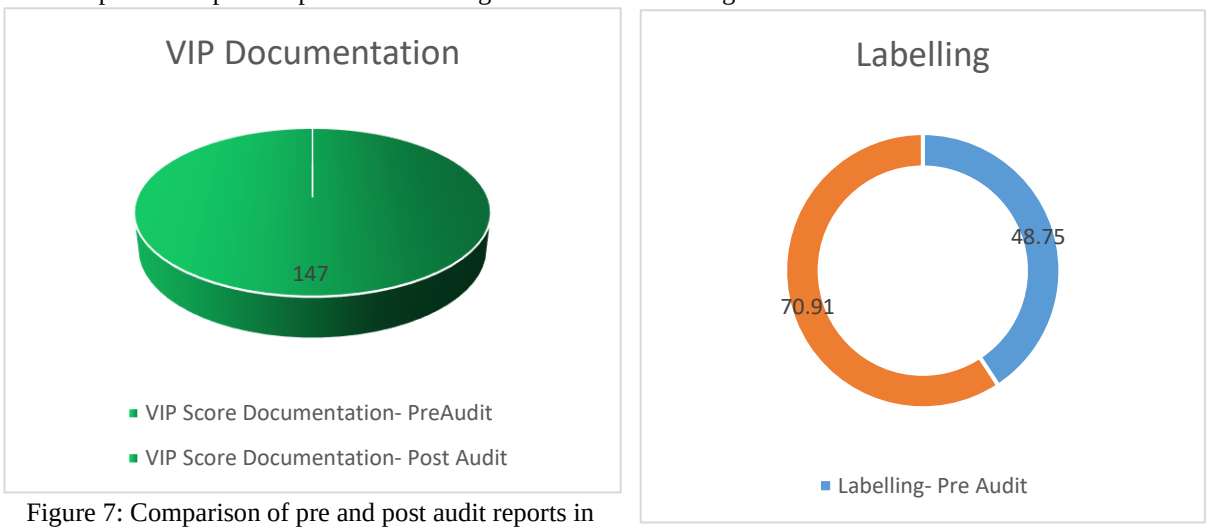

Figure 7: Comparison of pre and post audit reports in terms of VIP documentation and labelling

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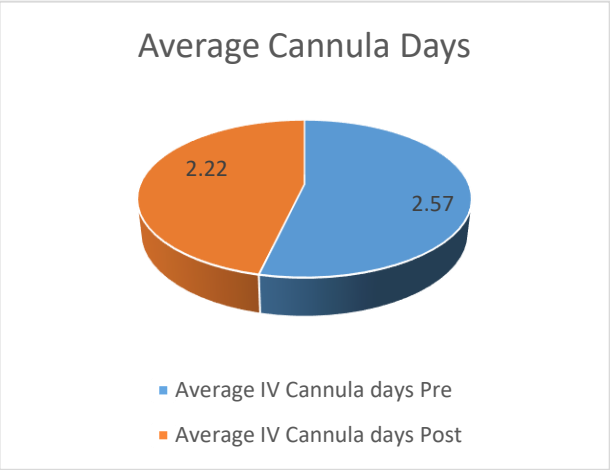

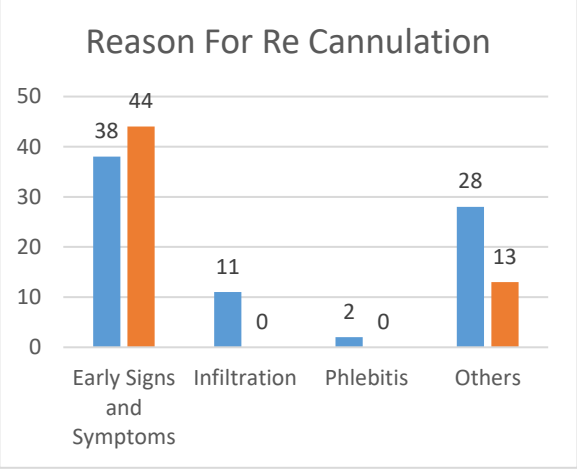

Figure 8: Comparison of pre and post audit reports in terms of average cannula days and reasons for re- cannulation.

The average pre- test score was 2.04 whereas the average for post-test is 3. 51. The pre-test was obtained from 324 candidates and post-test attended by 201 candidates. The comparison of the scores are given below.

Q No	No of Correct Answers- Pre Test	No of Correct Answers- Post Test	Percentage- Pre Test	Percentage- Post Test
1. Mechanical Phlebitis can caused by the folowing;Except	71	117	21.9%	58.21%
2. Phlebitis is the inflammation of ----------layer of superficial vein	109	99	33.64%	49.25%
3. According to VIP score canula need to resite, if the score is equal to or above	155	135	47.83%	67.16%
4. The size of a grey coloured canula is	269	187	83.02	93.03%
5. Leakage of non vesicant in to the extravascular tissue is known as	61	94	18.83%	46.77%

Figure 9: Comparison of pre and post test scores and percentages

V. DISCUSSIONS AND CONCLUSIONS

Patient safety and clinical outcomes are the ultimate aim of nursing care. Almost 90%of the inpatients in the hospital is having an IV access and more than 40% is having continuous infusions. It is important to maintain the patency assess the proper function8ing of the line. The campaign was a great success in terms of imparting knowledge and awareness among the nurses and strengthening the prophylactic assessment and documentation.
The campaign concluded with a systematic sustainment plan that including at least one training on the topic per month, hands-on training on quarter basis, continuation of audits and usage of uniform cannulation tray and on-job trainings by the cannulation team.

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