

Project Title

Peripheral Administration of Vasoactive Agents In The Emergency Department And Intensive Care Unit: A Nurse-Driven Quality Improvement Initiative

Project Lead and Members

Project lead: SSN Trang Thi Thuy Linh

Project members: SSN Teu Pu Yin Alaine, APN Chong Yu Hooi Agnes, SSN Lau Sheue Man Heather, SSN Hafirah Binte Abdul Jabbar, SSN Aye Wint Khin, Pharmacist Wong Fui Chung Christina, Dr Goh Ee Ling

Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group Involved in this Project

Nursing, Medical, Pharmacy

Applicable Specialty or Discipline

Internal Medicine, Intensive Care, Radiology

Project Period

Start date: Jun 2022

Completed date: Jun 2023

Aims

Our project aims to evaluate the safety of peripheral administration of vasoactive agents within a written protocol for patients in ED and ICU

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

We leverage on the strengths of each team member in a multi-disciplinary workgroup and establish essential groundwork prior to implementation. Clear communication with ground staff and encouraging feedback enables us to improve the process. Engaging all relevant stakeholders is crucial for a successful collaboration.

Conclusion

See poster appended/ below

Project Category

Care & Process Redesign

Quality Improvement (Clinical Practice Improvement)

Keywords

Peripheral Administration, Vasoactive Agent, ED, ICU, DVD, PIV, CVC, Catheter, Intravenous

Name and Email of Project Contact Person(s)

Name: Trang Thi Thuy Linh

Email: Trang_Thi_Thuy_Linh@nuhs.edu.sg

PERIPHERAL ADMINISTRATION OF VASOACTIVE AGENTS IN THE EMERGENCY DEPARTMENT AND INTENSIVE CARE UNIT: A NURSE-DRIVEN QUALITY IMPROVEMENT INITIATIVE

SSN TRANG THI THUY LINH, SSN TEU PU YIN ALAINE, APN CHONG YU HOOI AGNES, SSN LAU SHEUE MAN HEATHER, SSN HAFIRAH BINTE ABDUL JABBAR, SSN AYE WINT KHIN, PHARMACIST WONG FUI CHUNG CHRISTINA, DR GOH EE LING

- SAFETY
- QUALITY
- PATIENT EXPERIENCE

- PRODUCTIVITY
- COST

Background & Aim

❖ Background

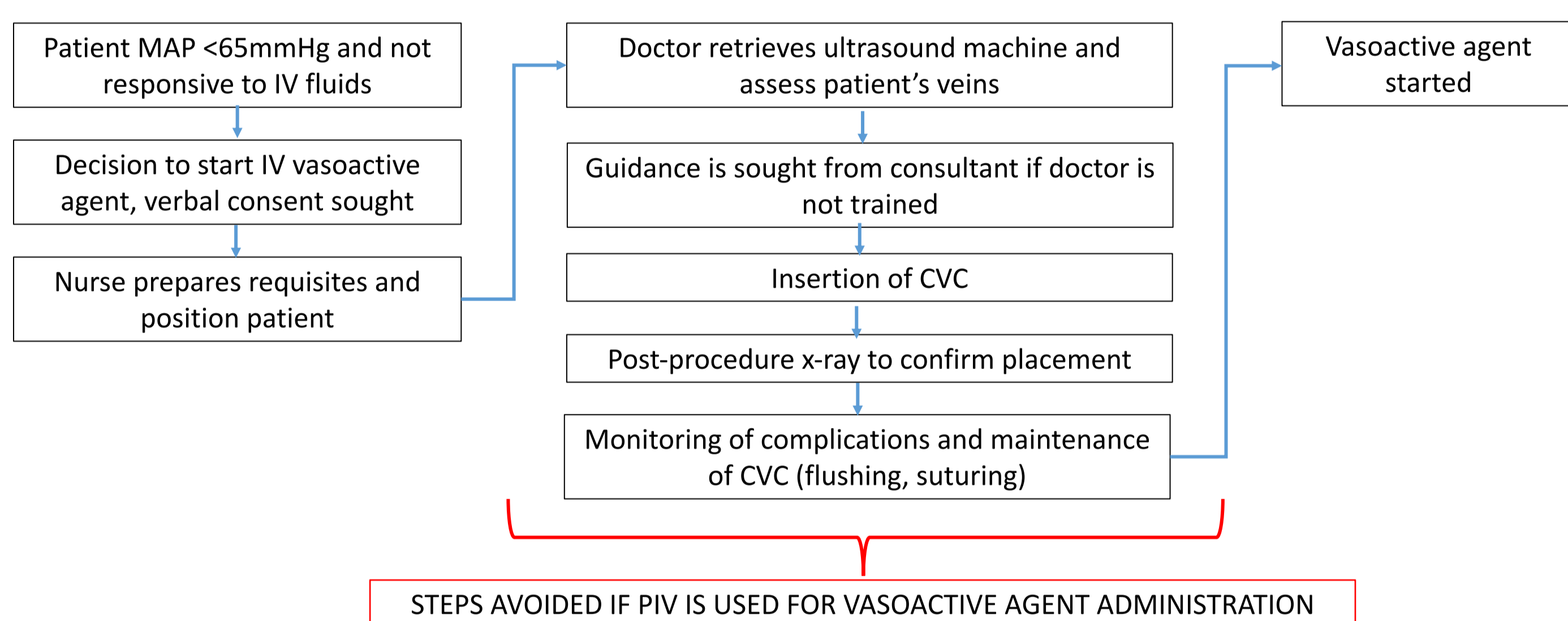
- Vasoactive agents are commonly used in Emergency Department (ED) and Intensive Care Unit (ICU) for critically ill patients
- They are traditionally given via central venous catheters (CVC) instead of peripheral intravenous (PIV) access due to concerns for extravasation
- However, CVC insertion is associated with various complications and delays administration as it takes considerable time to prepare, insert and verify placement
- Initiating vasoactive agents via PIV allows early administration of vasoactive agents and potentially reduces the need for CVC, its associated risks and healthcare costs
- Recent studies have demonstrated the safety of administering vasoactive agents via PIV access when practised within a written protocol

❖ Aim

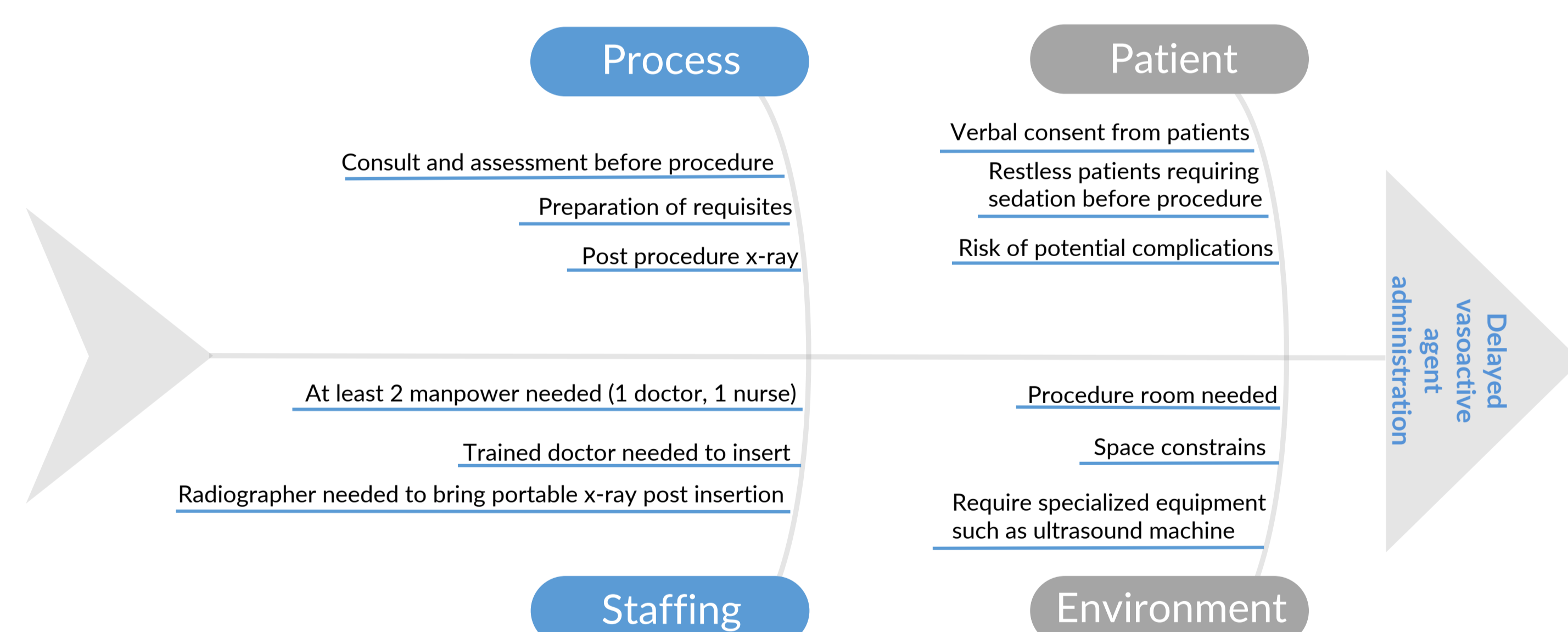
Our project aims to evaluate the safety of peripheral administration of vasoactive agents within a written protocol for patients in ED and ICU

Analyse Problem

Process when a patient requires vasoactive agents

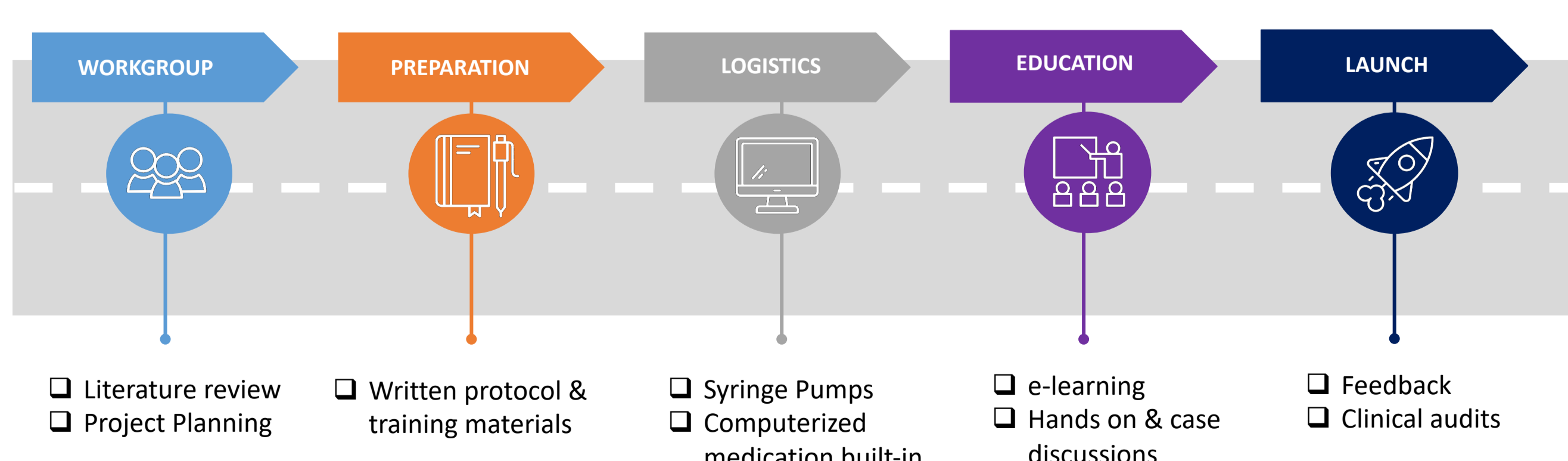


What are the probable root causes?



Protocol Development

- A multi-disciplinary workgroup comprising ICU/ED doctors, nurses and pharmacist is formed for this quality improvement initiative
- We develop a written protocol and provide training for nurses. Syringe pumps were updated and computerized medication orders were built in prior to implementation on clinical grounds.
- Regular clinical audits and feedback were performed to assess for compliance and safety of the protocol



Our Protocol

Vasoactive agents used in this study

| Vasopressor | Concentration | Max Dose |
|---------------|-------------------------------|--------------|
| Noradrenaline | 4mg in 100ml D5W (40µg/ml) | 0.3µg/kg/min |
| Dopamine | 200mg in 125ml D5W (1.6mg/ml) | 20µg/kg/min |
| Phenylephrine | 10mg in 100ml NS (100µg/ml) | 10,000µg/hr |

❖ Initiation Of Therapy:

- The decision to initiate vasoactive agent infusion via PIV must be approved by a senior doctor.
- The PIV access must be placed in the **forearm, antecubital fossae, upper arm, or external jugular vein.** The hand, wrist and foot are to be avoided
- The IV cannula must be **≥ 20G**
- The **MAX DURATION** of therapy is **12 HOURS**

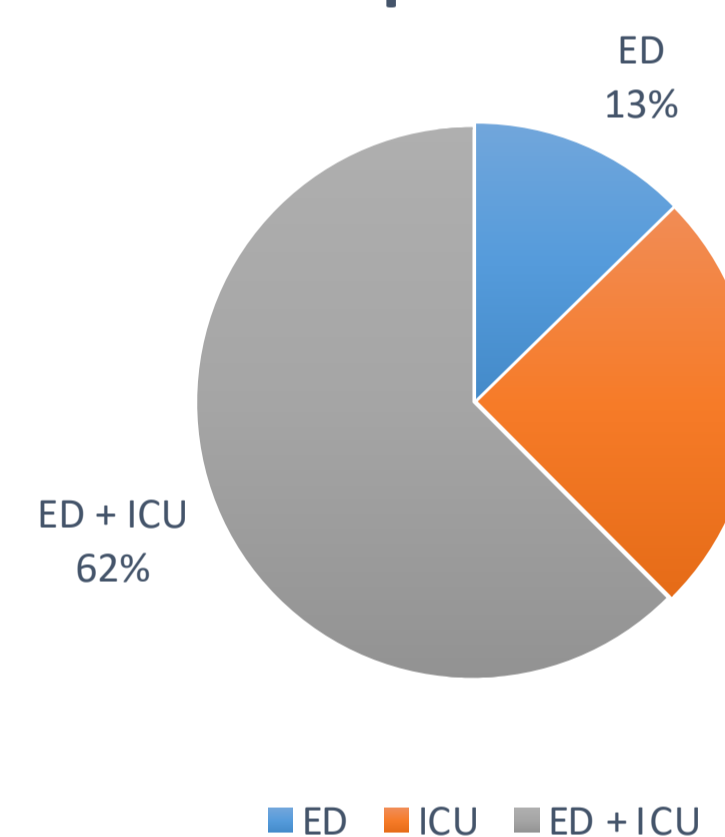
❖ Monitoring During Therapy:

- Close monitoring of IV site must be done strictly **every 30 minutes**
- Assess and grade using **The Infusion Nurses Society Infiltration Scale**

| | The Infusion Nurses Society Infiltration Scale | | | | |
|-------------|--|-------------------------|------------------------------|------------------------------------|---|
| | Grade 0 | Grade 1 | Grade 2 | Grade 3 | Grade 4 |
| Skin Colour | | Blanched | Blanched | Blanched, translucent | Blanched, translucent Tight, leaking Discoloured, bruised, swollen |
| Edema | | <2.5cm in any direction | 2.5 to 15cm in any direction | Gross edema >15cm in any direction | Gross edema >15cm in any direction |
| Pain | | With or without pain | With or without pain | Mild to moderate | Moderate to severe |
| Numbness | No Symptoms | | Possible numbness | | |
| Temperature | | Cool to touch | Cool to touch | Cool to touch | |
| Others | | | | | Circulatory impairment Deep pitting tissue edema Infiltration of any amount of blood product, irritant, or vesicant |

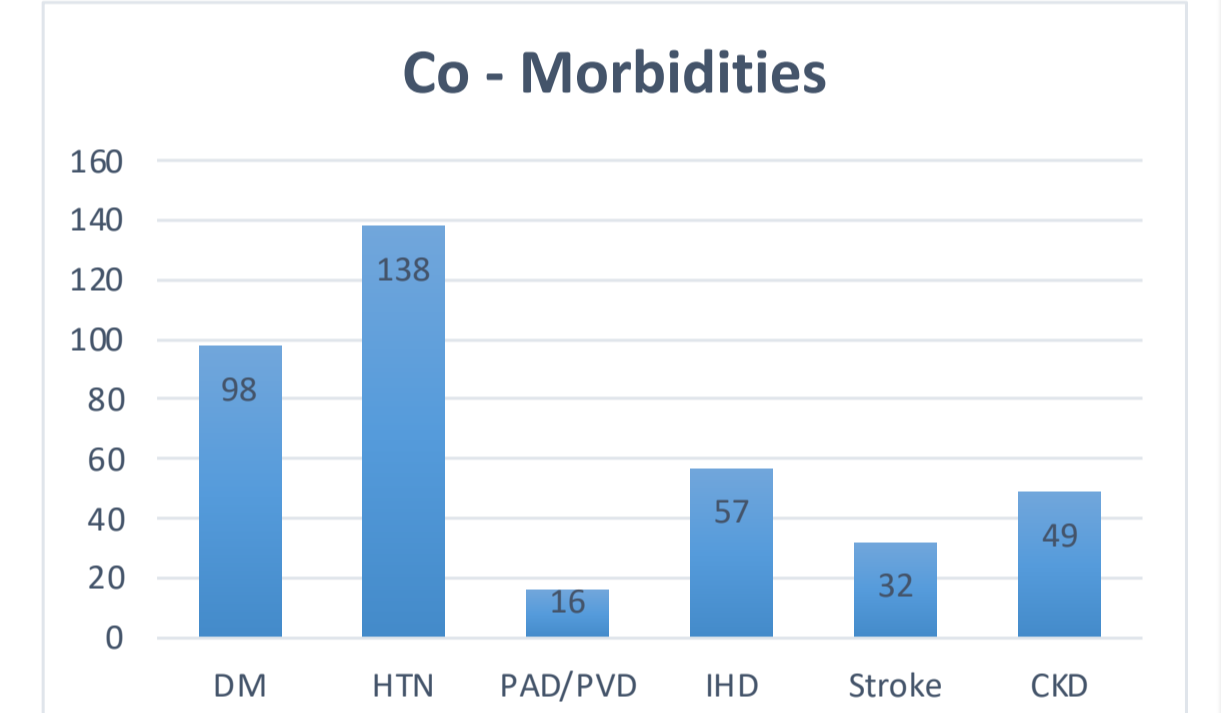
Results

Population

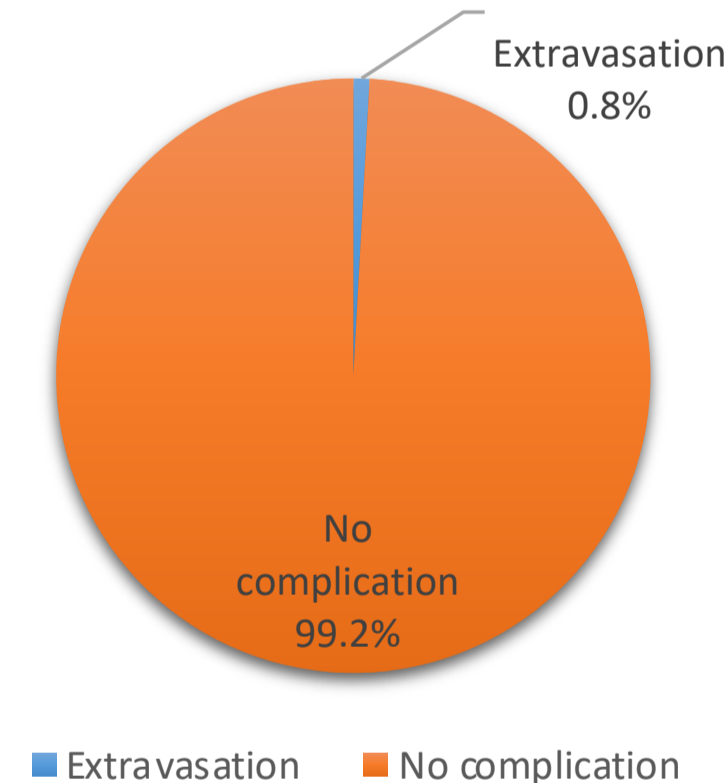


- Duration of data collection: 1 year (June 2022 – June 2023)
- Sample size: N = 229.
- Median age (IQR) = 65 (47,83)

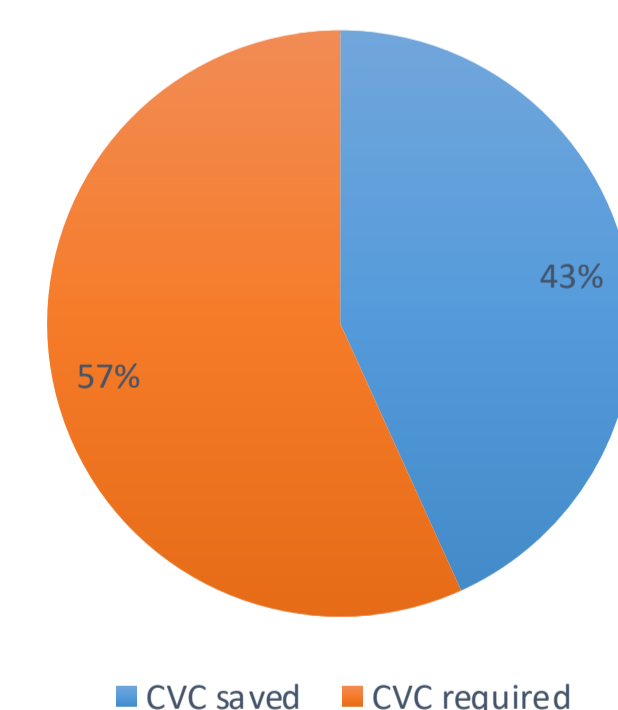
Co - Morbidities



Extravasation



- 2 out of 229 patients (0.8%) developed mild extravasation (grade 1) and did not require any tissue injury treatment. Both incidences were noted to be associated with a breach in the protocol by
 - Infusing beyond recommended duration (16 hours) &
 - Infusing over an PIV access placed at extremity (wrist)



- 42% (n=99) did not require CVC insertion after initiating vasoactive agents via PIV access.
- Out of 99 patients, majority of them (n=70) did not require CVC insertion as they achieved hemodynamic stability.
- Other reasons for not requiring CVC were reported to be demised (n=17) or palliation (n=7).

Spread Changes, Learning Points

What are/were the strategies to spread change after implementation?

- In the initial phase of implementation, workgroup champions engaged staff regularly on clinical grounds to familiarize them with the protocol.
- Regular feedback was elicited to facilitate improvements in work process.
- Continuous training and timely reminders are used to promote protocol compliance
- Moving forward, we aim to integrate checklist and monitoring forms into EPIC to enable easy documentation

What are the key learnings from this project?

- We leverage on the strengths of each team member in a multi-disciplinary workgroup and establish essential groundwork prior to implementation.
- Clear communication with ground staff and encouraging feedback enables us to improve the process.
- Engaging all relevant stakeholders is crucial for a successful collaboration