

Project Title

Improving Preparation of Sodium Nitroprusside in Operating Theatres: Less Wastage
More Efficient

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital

Healthcare Family Group(s) Involved in this Project

Medical

Applicable Specialty or Discipline

Cardiology, Surgery

Project Period

Start date: Jan 2022

Completed date: Mar 2022

Aims

- To reduce the number of vials used in the preparation of Sodium Nitroprusside for Cardiothoracic Surgery in the Operating Theatre from a median of 8 vials/Week to 4 vials/week within the next 6 months.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Project Category

Care & Process Redesign, Quality Improvements, Workflow Redesign, Clinical Practice Improvement, Productivity, Cost Saving

Training & Education, Learning Approach, Team Based Learning

Keywords

Intravenous Vasodilator, Cardiothoracic Surgery, Changed Standard of Practice

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- care
- education
- research



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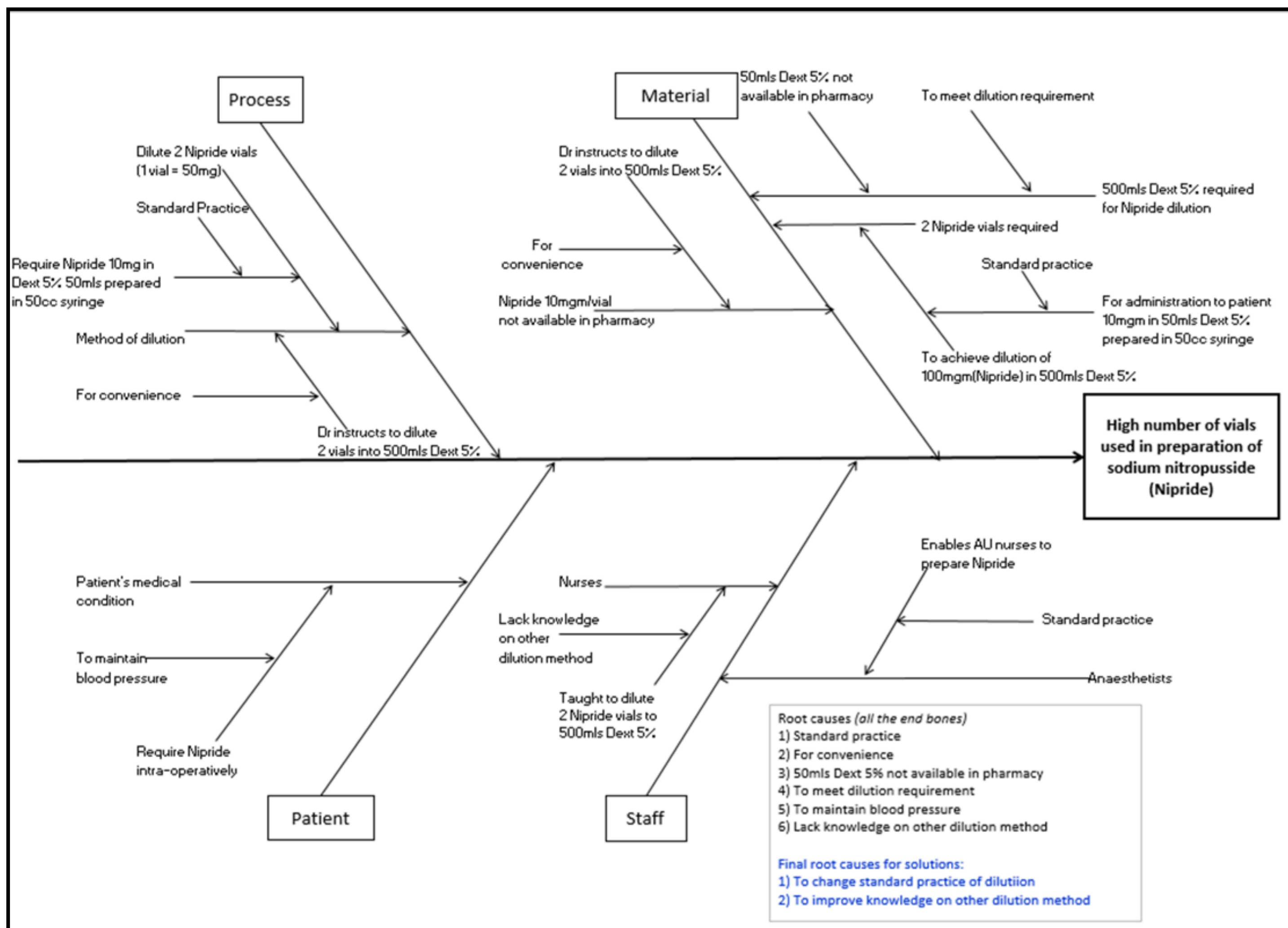
Background of the problem

Sodium Nitroprusside is an intravenous vasodilator used in cardiothoracic surgery. The current method of dilution for Sodium Nitroprusside is tedious, which required injecting 2 vials of mentioned drug into a 500mls of Dextrose 5% solution and then withdrawing only 50 ml for infusion during surgery. Anaesthetic Unit (AU) nurse will discard the balance 450mls at end of surgery. This method has resulted in a high number of vials used in the preparation of Sodium Nitroprusside. The usage of Sodium Nitroprusside vials in 2021 was 496 vials, costing the department \$35,712 (\$72/vial). The team aims to reduce the number of vials used in the dilution of Sodium Nitroprusside, without any compromise to patient safety.

Mission Statement

To reduce the number of vials used in the preparation of Sodium Nitroprusside for Cardiothoracic Surgery in the Operating Theatre from a median of 8 vials/Week to 4 vials/week within the next 6 months.

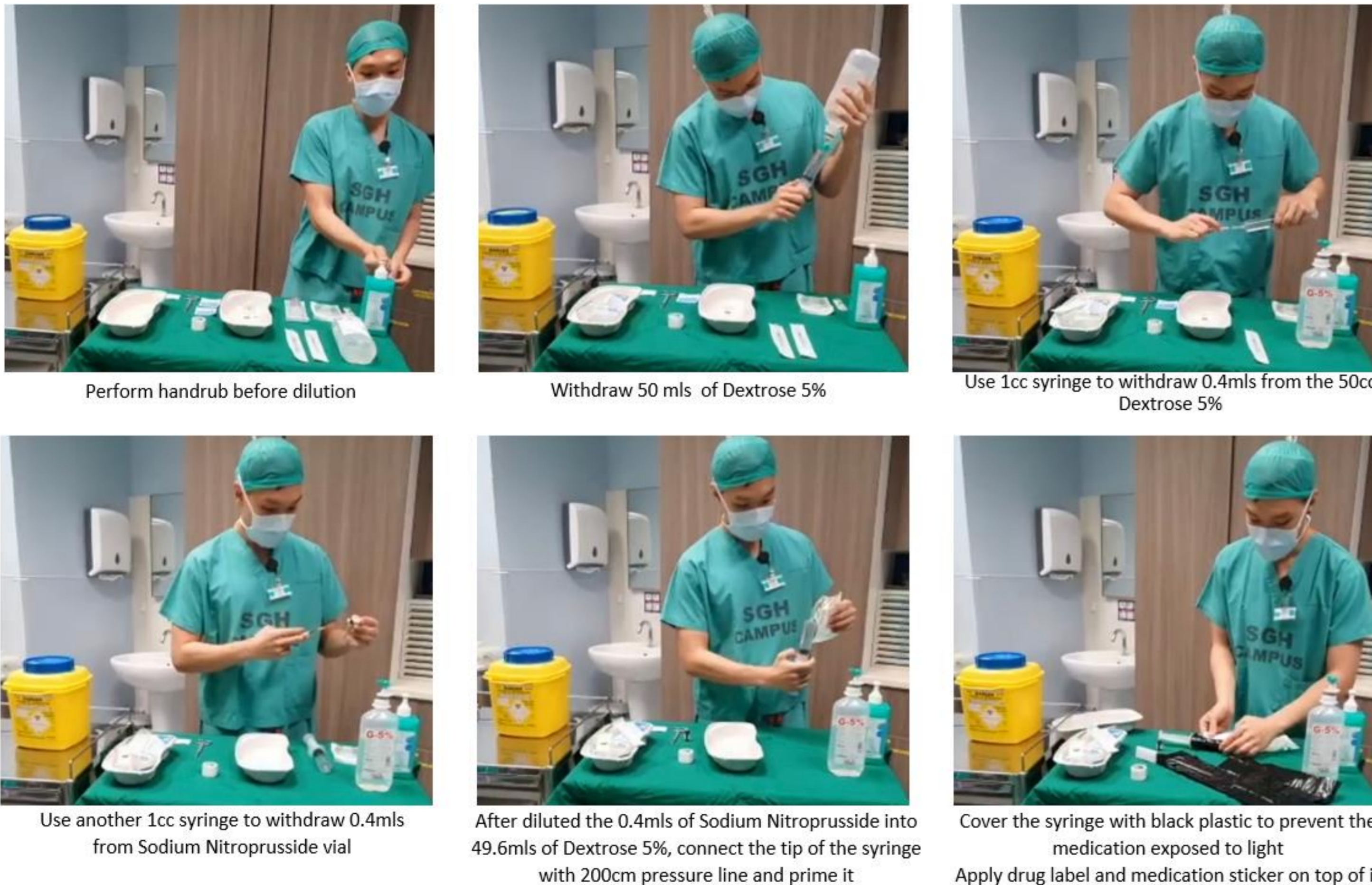
Analysis of problem



Interventions

PDSA 1 : Changed Standard of Practice: Approval for the new method of dilution for Sodium Nitroprusside was obtained from Pharmacist and acknowledged by the Cardiac Anaesthetists. The steps on dilution has also been reviewed by the Infection Prevention Nurse to exclude infection related issues such as risks of contamination during preparation and dilution.

PDSA 2 : Conducted Staff Education: The new steps on Sodium Nitroprusside dilution with a single vial was video-recorded.

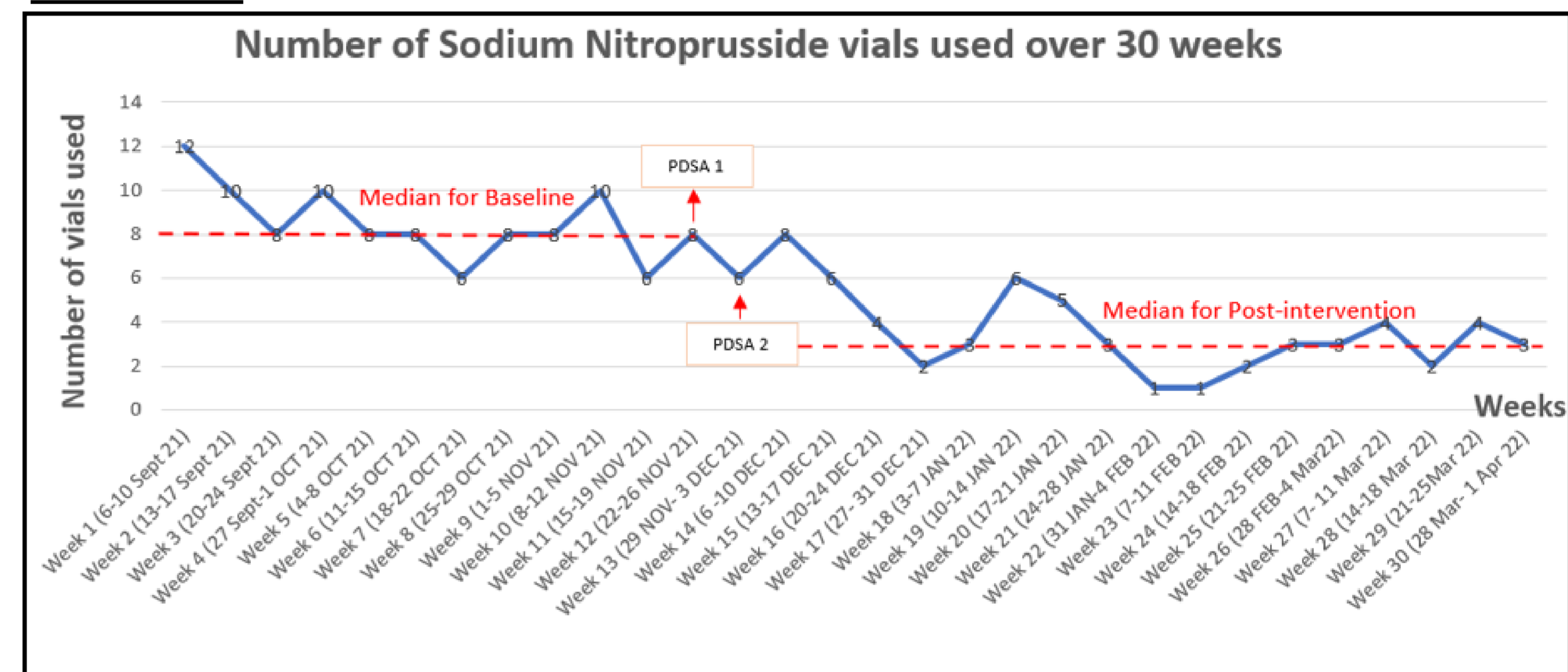


Interventions

Multiple sessions were held. AU nurses watched video and members conducted practical demonstrations. These were carried out in the afternoon when staffing is adequate due to the overlapping shift.

When the teaching sessions completed, a week after, AU nurses performed return demonstration on the new Sodium Nitroprusside dilution. This is to ensure they know and understand the new dilution method and are able to do it competently and safely.

Results



Number of vials used from Jan 2022 to Mar 2022 = 40 vials (first quarter).

Estimated number of vials used for 2022 = 160 vials (\$11,520)

Total number of vials saved : 496 vials - 160 vials = **336 vials (68%)**

We have met our objectives of reducing usage of Sodium Nitroprusside vials by more than 50% .

Total cost savings: \$35,712 (2021)- \$11,520 (2022) = **\$24,192**

Sustainability Plans

Team members are assigned routinely, to perform audit in the Operating Theatres. This is to ensure all the Staff Nurses are practicing according to the new standard procedures of Sodium Nitroprusside dilution using a single vial per patient.

We continue to collect feedback, which are generally positive, from the AU nurses and Anaesthetists. Guidelines for dilution are available and placed in all the Cardiac Operating Theatre requisition file for reference.

TO USE THIS FORMAT

The following is the new dilution format for AU nurses to prepare the drug for CTOT.

Sodium Nitroprusside 10mg in 50mls Dextrose 5% solution

Step 1: Use a 50ml syringe to draw 50mls of Dextrose 5% solution.

Step 2: Use a 1ml syringe to draw 0.4mls of Dextrose 5% from the 50ml syringe and discard.

Step 3: Use a new 1ml syringe to draw 0.4mls (10mg) of Sodium Nitroprusside and inject into the 49.6ml of Dextrose 5% to form Sodium nitroprusside 10mg in 50mls Dextrose 5% solution.

Step 4: Cover the 50 ml syringe with the protective sleeve provided and label with drug label.

**Please take note to follow any infection control practices for preparation of IV medications during the process.*

End of document

Guidelines for dilution in all Cardiac Operating Theatre requisition file

Conclusion

Usage of Sodium Nitroprusside depends on the number of operations, patients' acuity and Anaesthetists' preference. Nevertheless, this method of dilution has reduced the number of vials required for dilution from two vials to one vial, meeting the following:

- 1) SGH quality commitment of efficiency by "making full use of resources to improve processes and outcomes" and
- 2) SGH environment commitment by preventing unnecessary wastage, cost savings and nurturing and promoting awareness among our staff.