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MEDICINE

IMPROVING VALIDITY OF HEPATIC VENOUS PRESSURE GRADIENT MEASUREMENTS (HVPG): A QUALITY IMPROVEMENT PROJECT

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BACKGROUND

HVPG is the gold standard method of diagnosing and assessing treatment response of clinically significant portal hypertension (CSPH). Inconsistencies in HVPG measurement can be affected by variability in catheter positions within the hepatic vein and differences in inter-operator practices.

AIMS AND OBJECTIVES

To improve the validity of HVPG measurements from 80% to 100% for all patients who undergo HVPG measurement in Singapore General Hospital (SGH) in a 15 month period (April 2021 - July 2022).

Validity defined as[1]:

1. Free hepatic vein (HV) – inferior vena cava (IVC) pressures ≤ 2mmHg, OR
2. Medial catheter position in the HV

METHODS

- Quality improvement (QI) project was performed using the Plan-Do-Study-Act (PDSA) model
- 3 most significant final root causes identified via pareto chart as
    1. Lack of intraprocedural replicable readings
    2. Suboptimal catheter position
    3. Inaccurate free HV pressure

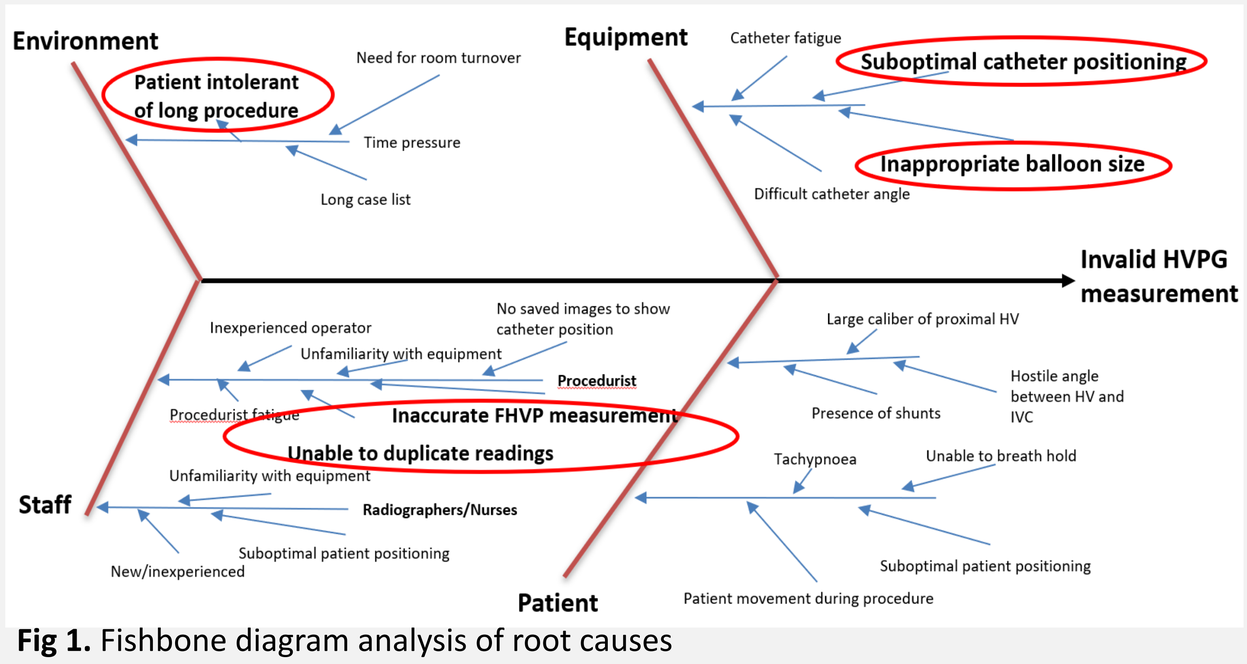

Fig 1. Fishbone diagram analysis of root causes

INTERVENTION:

1. Standardized protocol for triplicate readings and ensuring images of catheter positions saved via a protocolized proforma and checklist
2. Operator education during cross-disciplinary intra and inter-departmental meetings at each PDSA cycle
3. Introduction of larger 7Fr balloon catheter

- Data involving the test of change, namely catheter position accuracy and accuracy of FHVP-IVC was prospectively measured over a 15-month duration with data analyzed each month

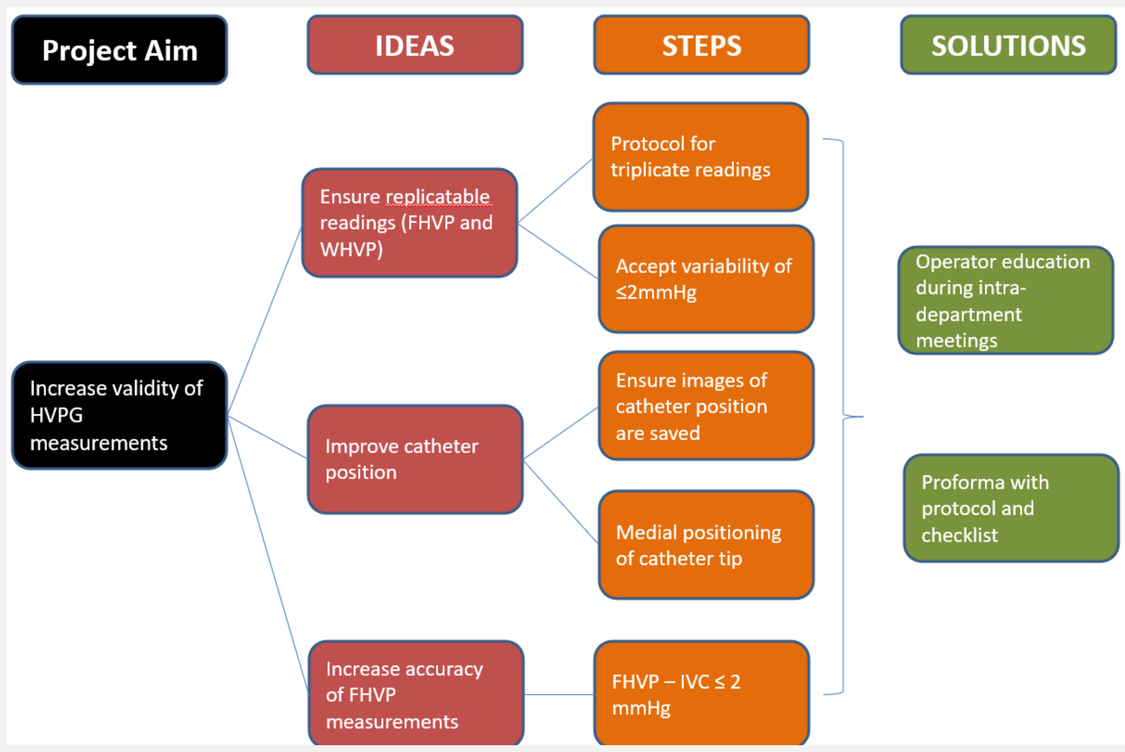

Fig 2. Driver diagram of ideas, steps and solutions

RESULTS:

Pre-QI: Baseline mean validity of HVPG measurement was 78%. Improvement demonstrated with each PDSA cycle with sustained improvement demonstrated in the third cycle. Mean validity post-implementation was 95% (p=0.045, chi-square test)

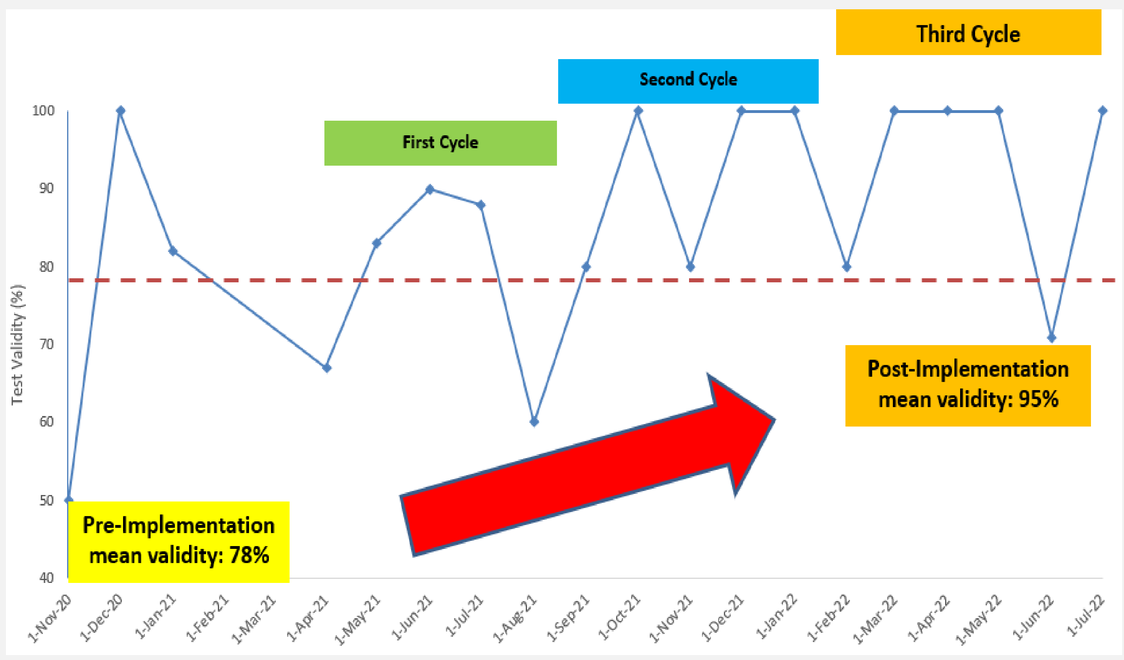

Fig 3. Mean HVPG test validities pre and post implementation

CONCLUSION:

- Through a QI project, demonstratable clinical and statistically significant improvement in the validity of HVPG was achieved
- Post-intervention parameters for HVPG measurement have become recognized quality metrics within the department
- Outcomes will be continuously monitored via regular internal audit for sustainability

1. Tey TT et al. Singapore Med J. 2016.