Quality Problem

Pediatric patients with pulmonary hypertension (PHTN) are a high acuity, low frequency population. To mitigate the risk of precipitating a potentially life-threatening pulmonary hypertensive crisis, health care staff need to take specific precautions.

Background

A pulmonary hypertensive crisis can lead to right heart failure and/or cardiac arrest.
- Occurs when the pulmonary vasculature has a high resistance→little or no preload to the left ventricle & unsustainable afterload to the failing right ventricle
- Can be triggered by multiple inciting factors: e.g., increased cardiac demand, parenchymal lung disease, hypovolemia, or fever

Acute pulmonary hypertensive crisis is a life-threatening emergency with a high risk of cardiorespiratory collapse necessitating cardiopulmonary resuscitation

AIM Statement

This quality improvement project aims to increase the number of inpatient PHTN patients for whom PHTN precautions are applied to 100% by September 2021.

QI Framework

Quality improvement (QI) is commonly used in healthcare settings to improve care delivery. Our overarching goals for this QI project are to improve provider understanding and application of PHTN precautions for pediatric patients with PHTN. The QI project was prompted by an occurrence where PHTN precautions were not applied, precipitating a PHTN crisis for a child.

For this QI project, we used the Institute for Healthcare Improvement’s Model for Improvement framework:

What are we trying to accomplish?
- Summarized in our SMART AIM statement

How will we know that a change is an improvement?
- We will use direct observation and medical record review to examine application of PHTN precautions for every patient with PHTN (a rare event) in the UNMH PICU

What changes can we make that will result in improvement?
- Summarized in figures
- Will be tested iteratively through a Plan, Do, Study, Act (PDSA) process

Cycle 1

Act
- Focus on application of knowledge rather than education of PHTN

Plan
- Increase PHTN knowledge of providers and staff

Study
- Average of 13/15 correct
- Prevention and management most commonly missed

Do
- Create knowledge survey to 21 providers and staff

Cycle 2

Act
- Create visual aid that includes PHTN precautions
- Place poster on door

Plan
- Find an accessible and simple method to reinforce PHTN precautions

Study
- 6 minute from PICU nursing, Medicine, and Pediatric personnel
- PHTN classifications

Do
- Perform literature review on PHTN
- Rounding standards for care regarding PHTN

Cycle 3

Act
- Include more direct and actionable content and language

Plan
- Improve visual aid
- Apply changes based on findings

Study
- Assess feedback from PICU staff

Do
- Display visual aid for nurses and residents

Cycle 4

Act
- Include what to do in action boxes
- Integrate with pathophysiology

Plan
- Update poster
- Delinate responsibilities based on role
- Set expert opinions

Study
- Assess feedback from Pediatric Cardiologist

Do
- Place revised visual aid poster on door
- Obtain feedback from Pediatric Cardiologist

Summary: PDSA Cycles

PDSA Cycle 1 assessed PHTN knowledge of our providers and staff with a survey. Average score was 5 out of 7 correct responses, with questions related to prevention and management of a PHTN crisis being the most missed. After obtaining and analyzing these results, the QI team decided to reduce our future PDSA cycles on education related to PHTN and instead focus on application of knowledge.

PDSA Cycle 2 consisted of researching current PHTN articles from various journals and determining how best to incorporate the findings into an effective visual tool. We created a door poster with the most relevant PHTN information for providers. The poster included brief pathophysiology, classifications, and clinical effects, as well as both prevention and crisis management.

PDSA Cycle 3 comprised of assessing how best to improve the visual tool by obtaining feedback from nursing staff and residents. After synthesizing the responses, we created a more directive title, simplified action boxes, and provided methods to prevent a crisis for both providers and nursing staff.

PDSA Cycle 4 focused on clarifying actions based on provider roles, as well as incorporating expert feedback from our Pediatric Cardiologist. Per their recommendations, the poster was revised to include what NOT to do in the action boxes, tying those actions to pathophysiology, and highlighting specified roles in each action box.

Next Steps

• Continue to conduct PDSAs to test and refine the visual door prompt
• Conduct PDSAs to address:
  - Consistent identification of all patients who require PHTN precautions
  - Systems directed interventions

References and Acknowledgements


Funding provided in part by the NM Human Services Department. Technical assistance provided by Envision NM 2.0.