CARDIOLOGY 2023

# DECREASING FLAT TIME POST CARDIAC CATHETERIZATION: A QI PROJECT


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# INSPIRATION FOR QI PROJECT:

- Cardiac transplant patient who had recently relocated from Texas came to CHOP and was surprised they had to lay flat for 6 hours post cardiac catheterization and biopsy
- They reported they only had to lay flat for 4 hours at their previous hospital
- QI questions and brainstorming started

# BACKGROUND/PURPOSE

CPRU Post Cardiac Catheterization Standard of care

- 6 hour flat time for femoral artery access
- 4 hour flat time for femoral vein access
- 2 hour flat time for internal jugular access

Goal

- To increase patient satisfaction and comfort by decreasing flat times without increasing rates of site bleeding

# 1ST STEP: LITERATURE REVIEW

- *In pediatric patients post-cardiac catheterization, does a shortened flat-time from 6 hours for femoral arterial access increase the risk or incidence of bleeding from the catheter access site?*
- Evidenced Based Practice literature review was completed examining post cardiac catheterization flat times
- The search was completed in October 2019 using Pubmed, Ovid, Systematic review and google scholar
- The literature review identified 24 articles addressing flat time, femoral access, and bleeding
- Only 2 articles were identified that focused on pediatric patients
    - One reported results of an international benchmarking survey and the second reported a randomized controlled trial

# BENCHMARKING SURVEY

In a Benchmarking survey, Brown, et al. sent a 36 question survey with questions about care and management of patients post catheterization to 113 Pediatric Institutions

- 59 institutions responded
  - 50% - 61.9% reported 6 hr. flat time(with/without heparin) for arterial access
  - 26.9%- 37.5% reported 4 hr. flat time (with/without heparin) for venous access

# PEDIATRIC RANDOMIZED CONTROLLED TRIAL ST. LOUIS CHILDREN'S HOSPITAL, MISSOURI

Raic, et al (2020) completed a randomized controlled trial comparing reduced flat times versus standard care in 119 pediatric patients

Background:

- Pediatric patients were required to lie flat post cardiac catheterization for 4-8 hours
- No current research to support extended pediatric flat time
- Extended flat time in children can result in increased agitation and discomfort from longer flat time can lead to bleeding at site, need for additional sedation and potentially longer hospitalization
- Longer flat time can also lead to increased anxiety in parents
- Longer flat time can lead to increased workload for RN's to maintain the flat time

# RANDOMIZED CONTROLLED TRIAL

- 60 in experimental group- reduced flat times to 2 hours for femoral venous access and 4 hours for femoral arterial access
- 59 in control group- standard care flat times of 4 hours for venous and 6 hours for arterial

## Results:

No statistically significant differences in:

- Incidence of site bleeding
- Need for additional sedation
- Need for critical care admission

## Conclusions:

Flat time can be safely reduced

Based on this research, practice at St. Louis was changed to decrease flat time to 4 hours for femoral arterial access and 2 hours for femoral venous access

# QI PROPOSAL

- Project proposed to Cath Lab director Dr. Gillespie
- Transplant patients, identified for test of change as these patients have smallest catheter size and no interventions
- Cath lab QI lead Dr. Glatz approved & provided  transplant catheterization data
- Consult  QI process support
- Consult Nurse Scientist, Amy Lisanti for IRB submission

# CARDIAC TRANSPLANT CATH DATA

- 388 transplant cardiac catheterizations performed 2018-2020
- 245 included access of a femoral vein and/or a femoral artery

# PDSA (PLAN, DO, STUDY, ACT) METHODOLOGY

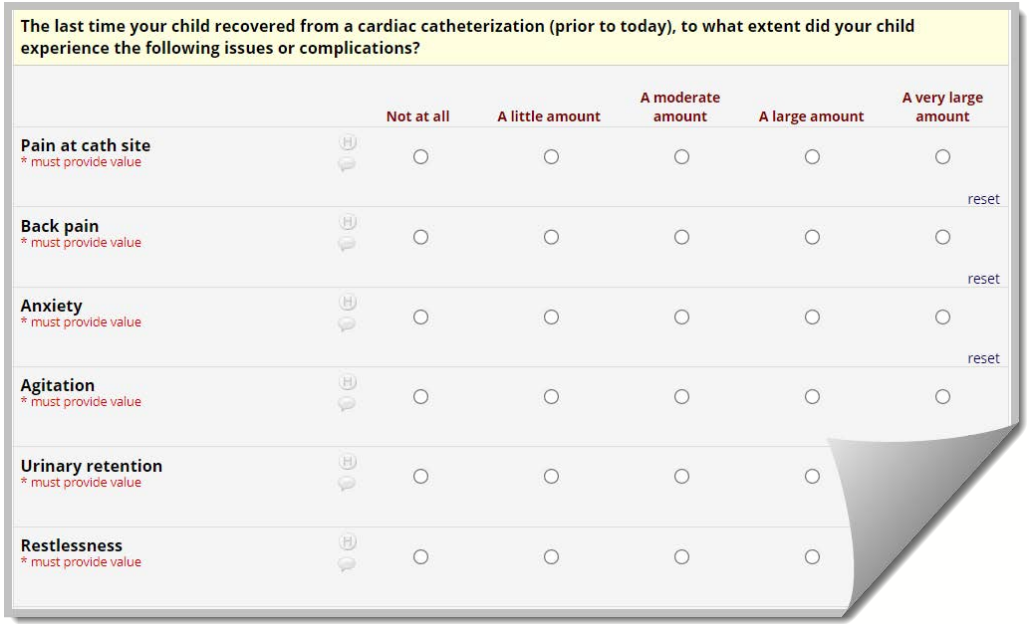
This Quality Improvement project utilized a PDSA methodology

# QI GOAL AND PDSA CYCLES

- Goal - to increase patient satisfaction and comfort post cardiac catheterization, without increasing rates of bleeding
- PDSA - incremental shortening of flat time for targeted transplant population
- Excluded
  - Intensive care unit recovery
  - Hematologic disease
  - Clinical judgement of the interventionalist

# QI PROJECT METRICS

- Patient/family satisfaction and comfort survey
- Pain scores
- Analgesia/sedation medications given in recovery



The last time your child recovered from a cardiac catheterization (prior to today), to what extent did your child experience the following issues or complications?

| | Not at all | A little amount | A moderate amount | A large amount | A very large amount |
|---|---|---|---|---|---|
| **Pain at cath site** * must provide value | ○ | ○ | ○ | ○ | ○ reset |
| **Back pain** * must provide value | ○ | ○ | ○ | ○ | ○ reset |
| **Anxiety** * must provide value | ○ | ○ | ○ | ○ | ○ reset |
| **Agitation** * must provide value | ○ | ○ | ○ | ○ | ○ |
| **Urinary retention** * must provide value | ○ | ○ | ○ | ○ | |
| **Restlessness** * must provide value | ○ | ○ | ○ | ○ | |

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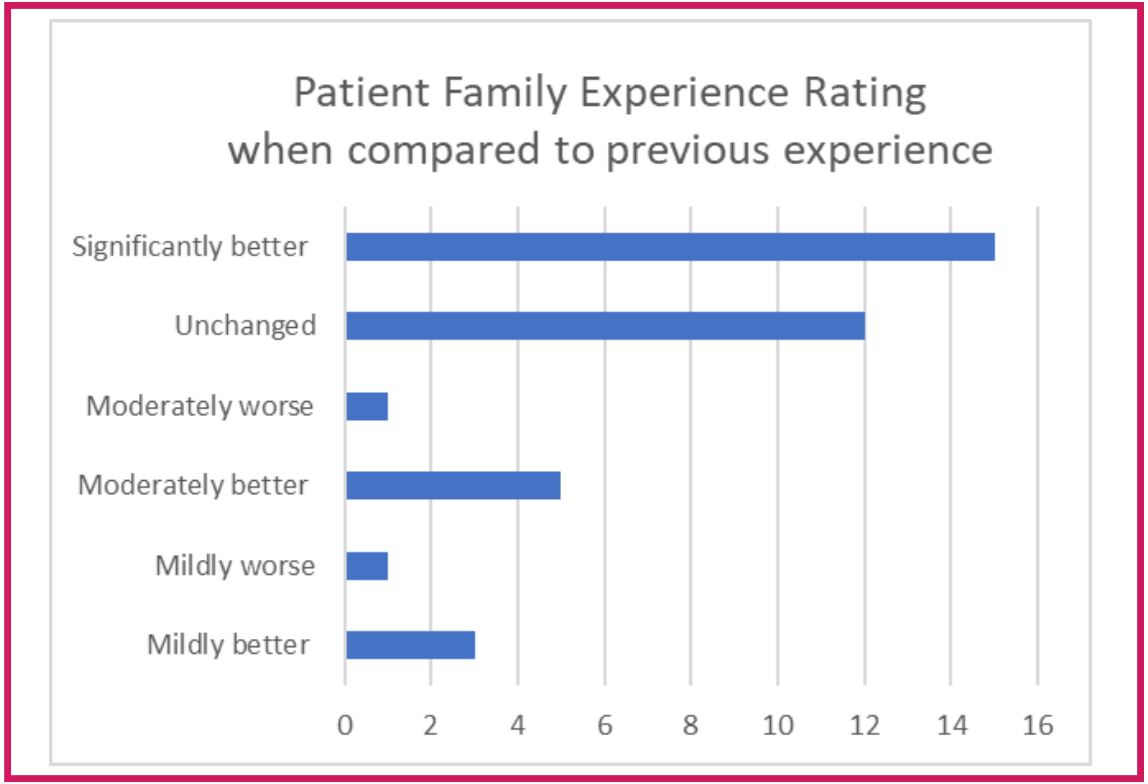
# PDSA CYCLE 1

- 3 months
- Flat time was reduced from 6 hours to 5 hours
- The patients remained in the CPRU for 1 hour of monitoring
- 19 patients were in this PDSA cycle
- 2 patients required additional sedation in the CPRU
- 2 patients reported pain score of 4 on scale of 1-10
    - one was headache

# PDSA CYCLE 2

- 3 months
- Flat time was decreased to 4 hours for femoral arterial access
- Patients remained in the CPRU for 1 hour of monitoring
- 17 patients in this PDSA cycle
- No patients required additional sedation
- 2 patients reported discomfort
  - "sore leg"
  - G tube site

# PATIENT/FAMILY SURVEY



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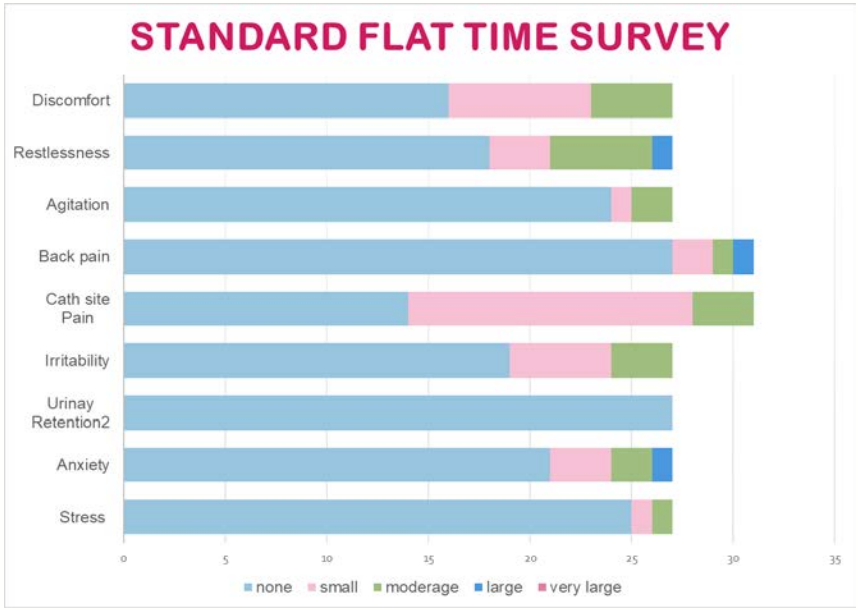


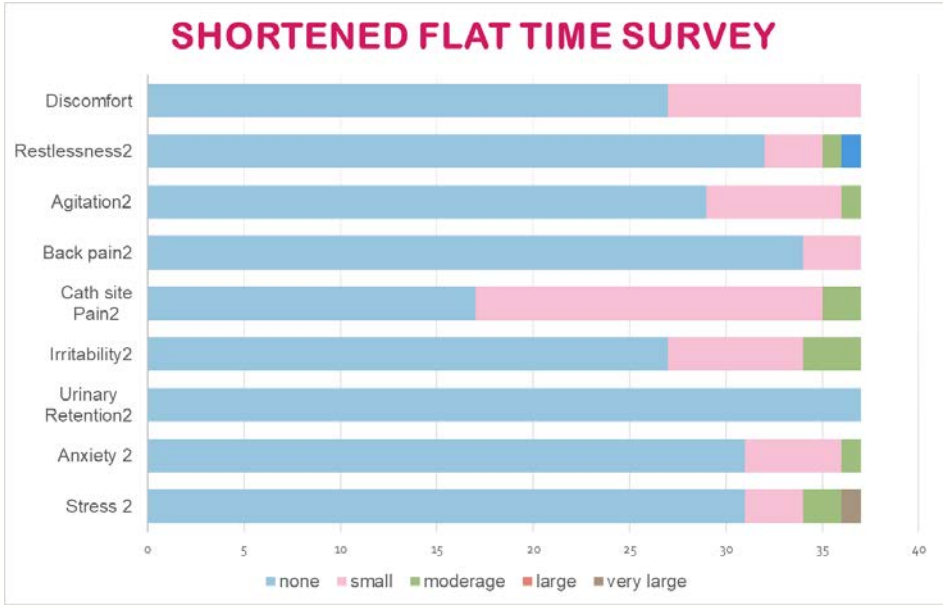


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# RESULTS/DISCUSSION

- NO impact on rate of mild or major site bleeding
- Patient/parent survey results reported same or improved experiences

# PATIENT/PARENT COMMENTS

- Less anxiety with decreased flat time
- Being able to move sooner was positive
- Good for our son's mental health
- NY Presbyterian had 4 hour flat time, so this was not a change
- John Hopkins had 4 hour flat time
- Shortened hospital stay was positive, especially with a 2 hour drive home

# CONCLUSIONS

Flat time successfully decreased to 4 hours for femoral arterial access for:

- Transplant patients undergoing catheterization and biopsy
- Hemodynamic catheterizations
- PDA device closures

# FUTURE GOALS

- Expand 4 hour flat time as standard of care beyond CPRU
- Expand 4 hour flat time to all types of cardiac catheterization
- Decrease femoral venous flat time to 2 hours

Future research may investigate potential causes of site bleeding such as catheter size, bleeding times, use of anticoagulants

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