

Improvement of PONV Documentation, Treatment and Rescue Therapy in the PACU

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Purpose

PONV in the PACU persists as an issue in our hospital, with consequences such as increased PACU length of stay, increased morbidity, and decreased patient satisfaction. This leads to inefficiencies at an enterprise-wide level. While there is a substantial amount of literature focused on PONV prophylaxis, PONV rescue treatments in the PACU setting are not as well-researched, and no definitive consensus has been reached on best management practices.

There is a lack of standardization in the approach to treatment of PONV in the PACU, leading to inconsistencies in the evaluation and outcomes of post-operative patients.

Study Aims:

- Determine incidence of PONV in PACU
- Evaluate the approach to administration of various pharmacologic interventions used for PONV treatment
- Determine the percentage of patients that receive any antiemetics in the PACU

Investigation Methods

- Chart Review (Jan. 24-Feb. 11, 2022) of sample population of 35 patients in PACU to determine what current documentation exists on both the nursing and physician side for PONV
- Literature review for existing PONV treatment
- Informal discussion with PACU nursing regarding assessment, documentation and treatment of PONV

Chart Review Results

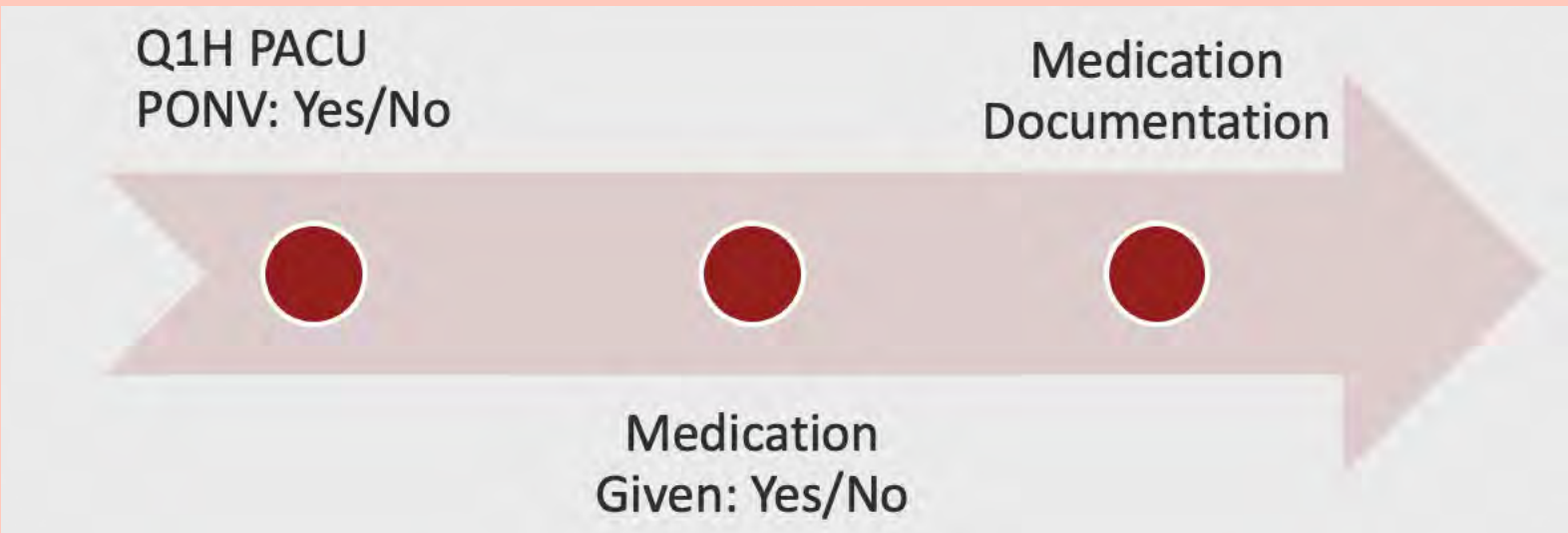
Results (Jan. 24-Feb. 11, 2022)	Data (N=35)	Findings/ Discussion
Documentation of PONV	20.0%	- Documentation of PONV was found from anesthesia post-procedure notes or surgery postop check notes. - There is currently no mandatory documentation of PONV . - Nursing does not have a consistent method to document PONV
Received at least 2 agents for PONV intraoperatively	68.5%	- The majority received dexamethasone and ondansetron - Seven patients (20%) received 3 agents, with the 3rd agent most often being a low dose propofol infusion.
First-line rescue agent in PACU was ondansetron	80.0%	- Other agents: metoclopramide, diphenhydramine, prochlorperazine, and scopolamine patch. - Unclear whether patients who received an antiemetic were experiencing PONV or were given additional prophylaxis in the setting of their risk factors.
Received 2 rescue antiemetics	25.7%	- The second agent was often one with a different mechanism of action from the first. However, one patient received ondansetron 4 mg IV as first-line and 8 mg ondansetron oral dissolved tablet as a 2nd rescue agent. - It is difficult to ascertain if diphenhydramine was administered for PONV as opposed to other indications such as pruritis/allergies - 3 (8.57%) patients received a scopolamine patch in PACU (ordered by the surgical team) prior to other rescue agents.

Baseline Assessment

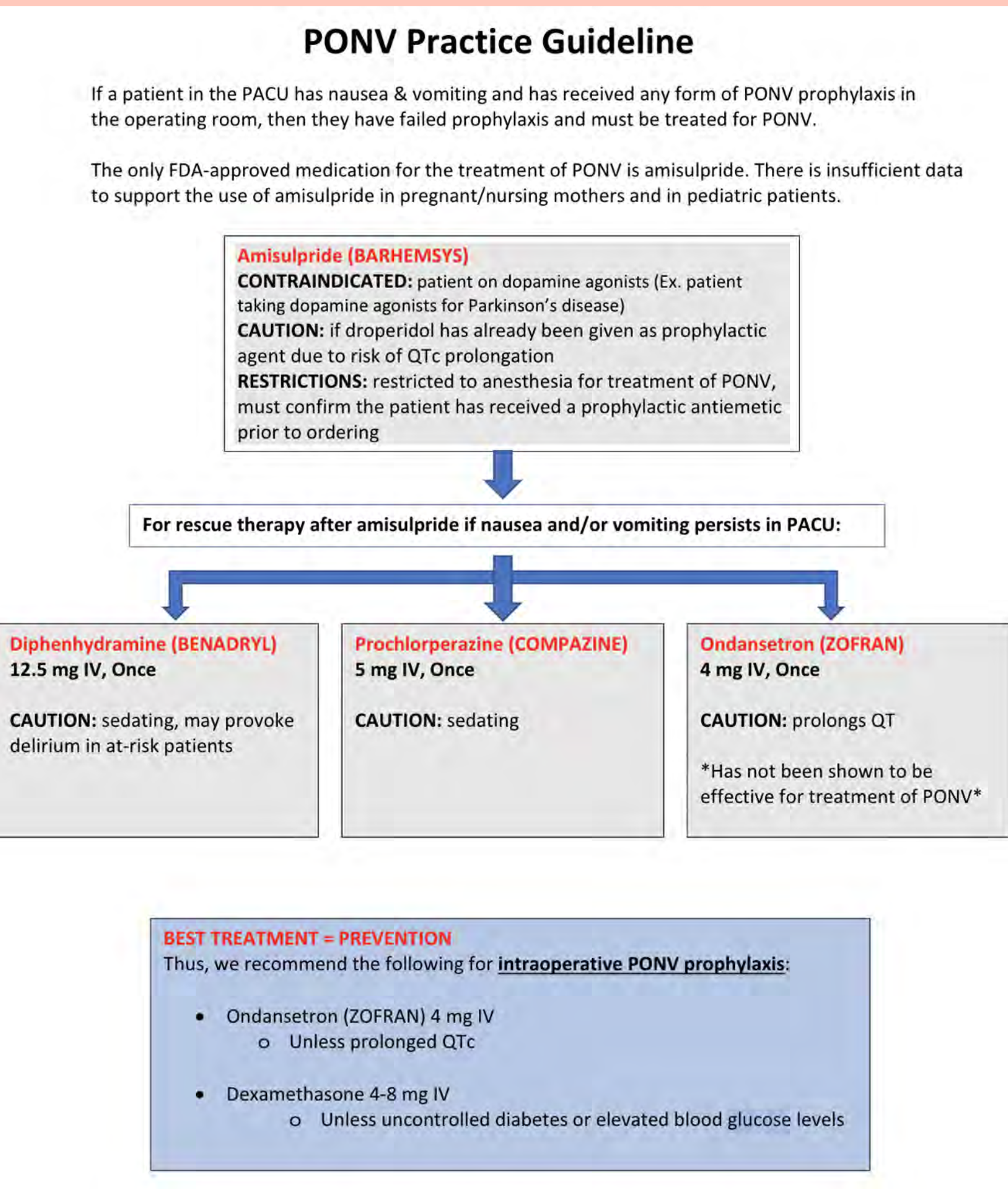
- There was no mandatory or consistent method of documenting the incidence of PONV or its resolution in PACU
- Various rescue therapies for PONV were identified, but there was inadequate documentation to determine their efficacy
- Rescue medications that have therapeutic purposes separate from PONV treatment (I.e., diphenhydramine) are also used
- Impossible to determine the true incidence of PONV in PACU

Proposed interventions

- Standardized mandatory EPIC documentation to identify PONV, allowing for calculation of true PONV incidence and precise identification of pharmacologic therapies used in the PACU
- Studying the various pharmacologic interventions would allow for assessment of efficacy of the interventions and better inform development of an effective treatment algorithm for PONV



Current PONV Algorithm



Future Directions

- Propose EPIC changes and education for improved documentation of PONV in PACU
- Reassess 6 months after implementation

Heat Exhaustion: Reducing Temperature Alarm Fatigue in the OR

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Purpose

- **Temperature monitoring** is recommended for
 - All general anesthesia cases
 - Cases lasting 30 minutes or longer
- Exposure to cold OR temperatures and anesthetic induction may significantly decrease body temperature at the onset of patient care.
- **Hypothermia** impacts wound healing, infection drug metabolism, time to emergence, and myocardial oxygen consumption. **Hyperthermia** can indicate important physiologic or disease states.
- Temperature alarms are frequently triggered as soon as the probes are connected, even as the temperature reading is equilibrating.
- **Alarm fatigue** renders the current alarms largely unhelpful for intraoperative temperature management and can **affect patient safety** by hindering early recognition of a dangerous change in temperature.

Aims: Reduce temperature alarming by 40-50%, as measured by pre/post-intervention surveys. Optimize temperature alarm parameters to reduce alarm fatigue.

Investigation Methods

- **Literature Review:** paucity of clinical recommendations for temperature alarms in OR
- **Electronic Survey** of faculty, residents, fellows, and CRNAs evaluating beliefs & practices for managing temperature alarms
- **EMR Audit:** Analysis of temperatures recorded in first ten minutes of temperature data. Sampled from all ambulatory cases over a two-month period.

Figure 1: Survey Results

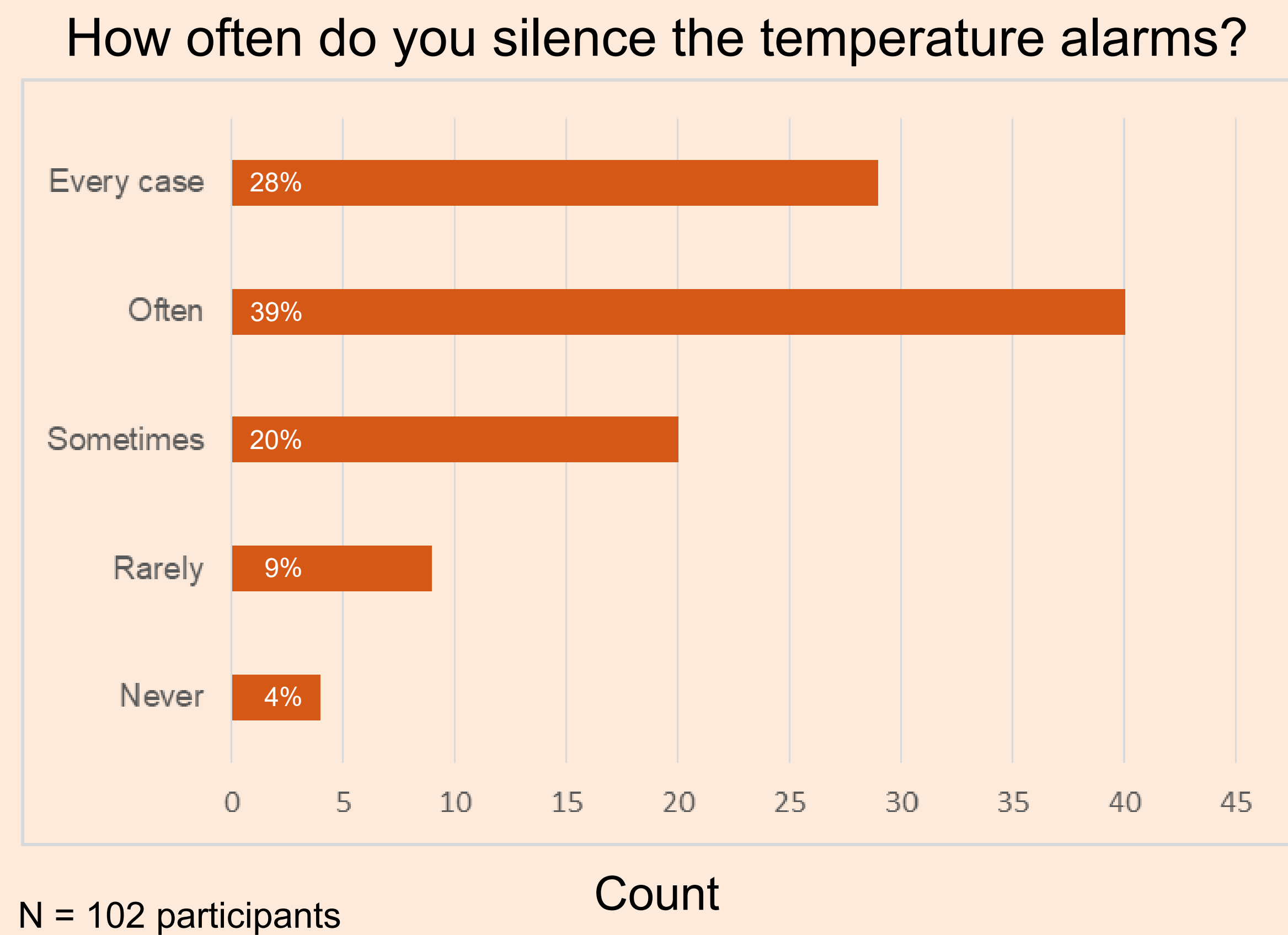
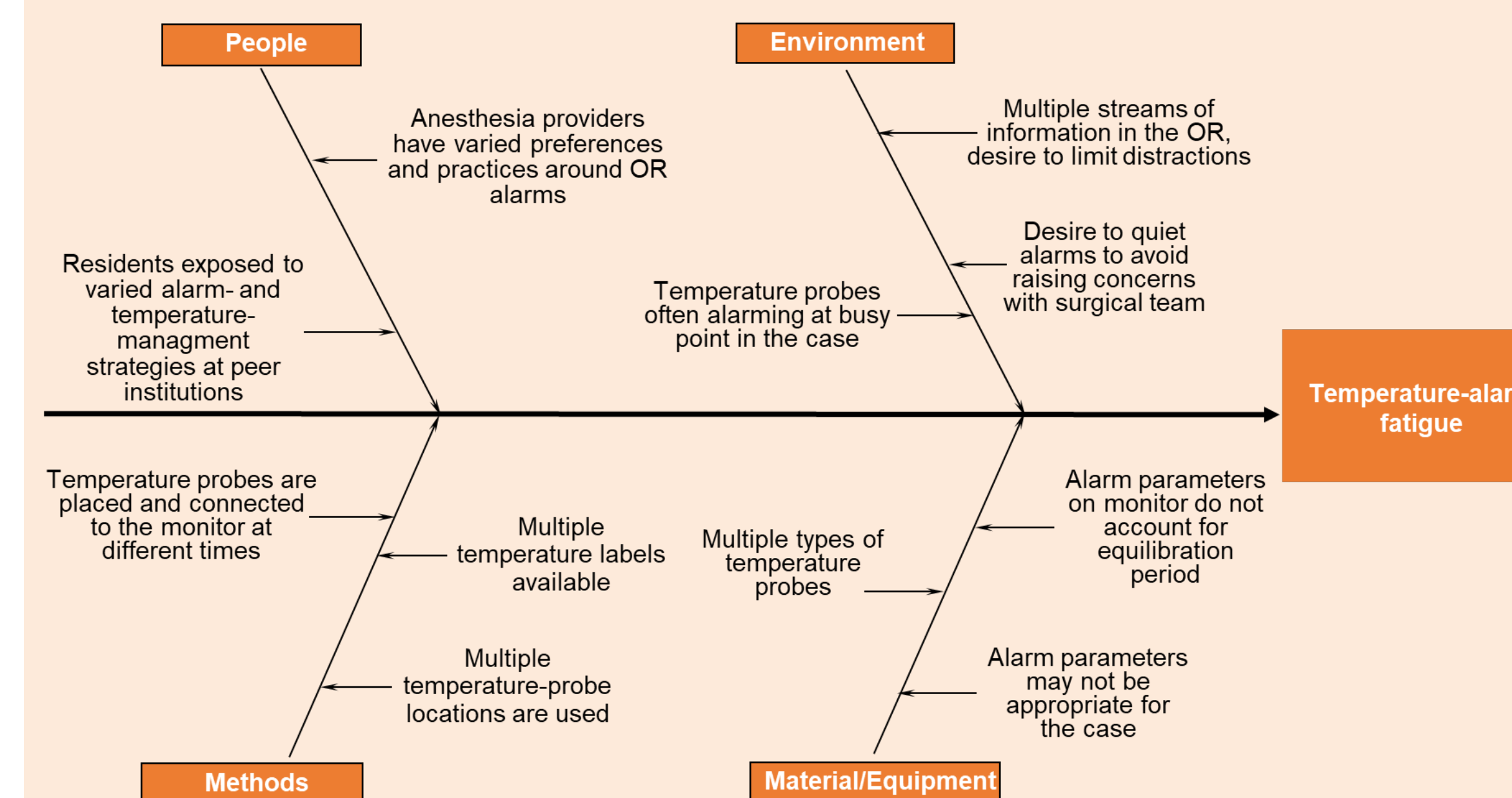


Figure 2: Fishbone Diagram



Current Alarm Parameters at NYP

- Current alarm limit ranges:
 - 36-39°C: Ttym, Tvesic, Tcereb, Tamb
 - 36-38.3°C: Trect, Tcore, Tskin, Tesoph, Tnaso, Tart, Tven
 - 35-38.3°C: Temp
- **Only “Temp” has a minimum temperature of 35°C**
- Based on our audit, temperature readings are **typically below 36°C before equilibration**, causing both an audio and visual alarm when the temperature probe is connected.

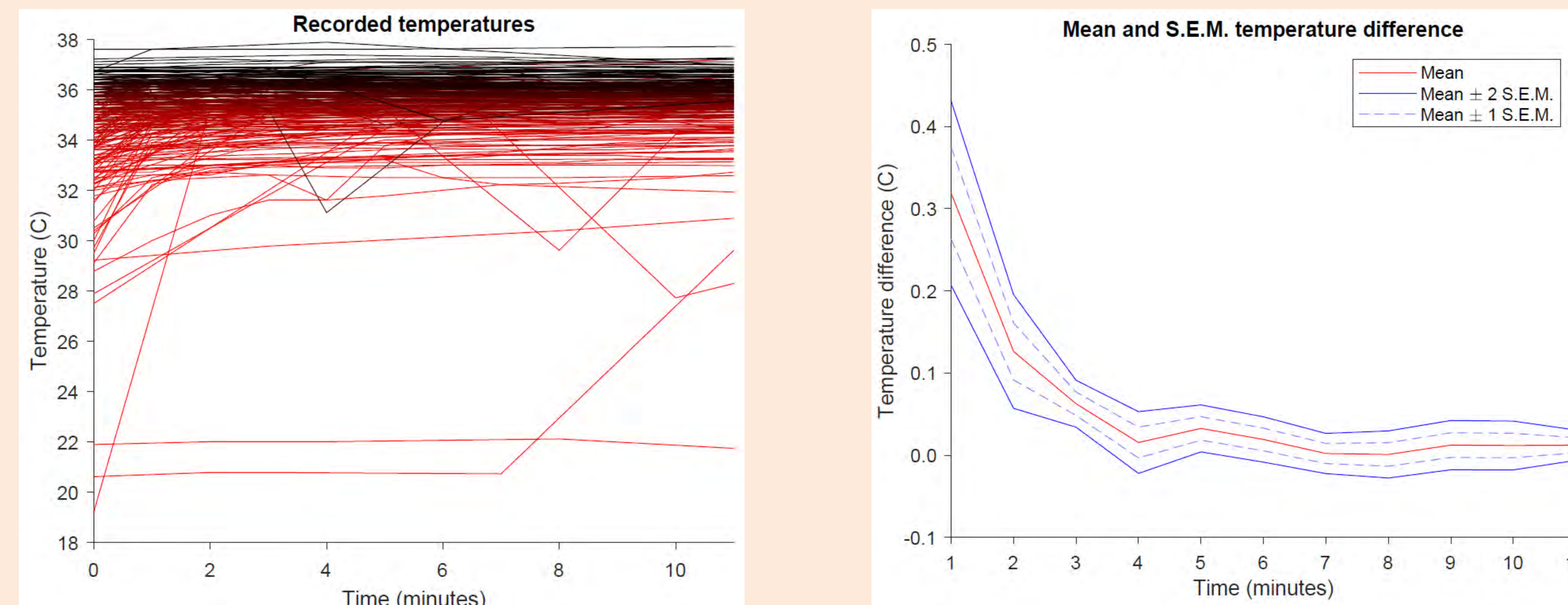
Proposed Solutions

- **Implement** “smart alarms” that allow 7-10 minutes of equilibration before alarming
- **Adjust** the default ranges for temperature labels
- **Require** selection of a temperature label when a probe is connected to the monitor (e.g., Tskin, Tesoph, Tnaso)

Future Directions

- **Discuss** possible systems changes with our equipment management team
- **Collaborate** with Biomed, Epic, and anesthesia providers to implement smart alarms and encourage use of temp site labels
- **Create** new parameters for the different temperature labels to decrease inappropriate alarms based on the location of the measured temperature
- **Collect** data and complete a post-intervention study to determine whether the implemented changes improve alarm fatigue and decrease unnecessary alarming

Figure 3: Time for Temperature Readings to Reach a Steady State



Results from 363 ambulatory cases performed during August and September of 2021.

Implementation of Novel Screening Tool to Improve Identification of Chronic Pain Patients During Preoperative Assessment Process

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The identification and management of chronic pain patients in the preoperative screening process, particularly those on chronic opioid therapy, is a critical focus in the field of pain management. Currently, there is no effective method to identify patients at high-risk for perioperative pain, and a history of chronic pain is often not elucidated until the day of surgery. Patients with chronic pain are thus sometimes admitted to the hospital without a thorough perioperative pain management plan delineated.

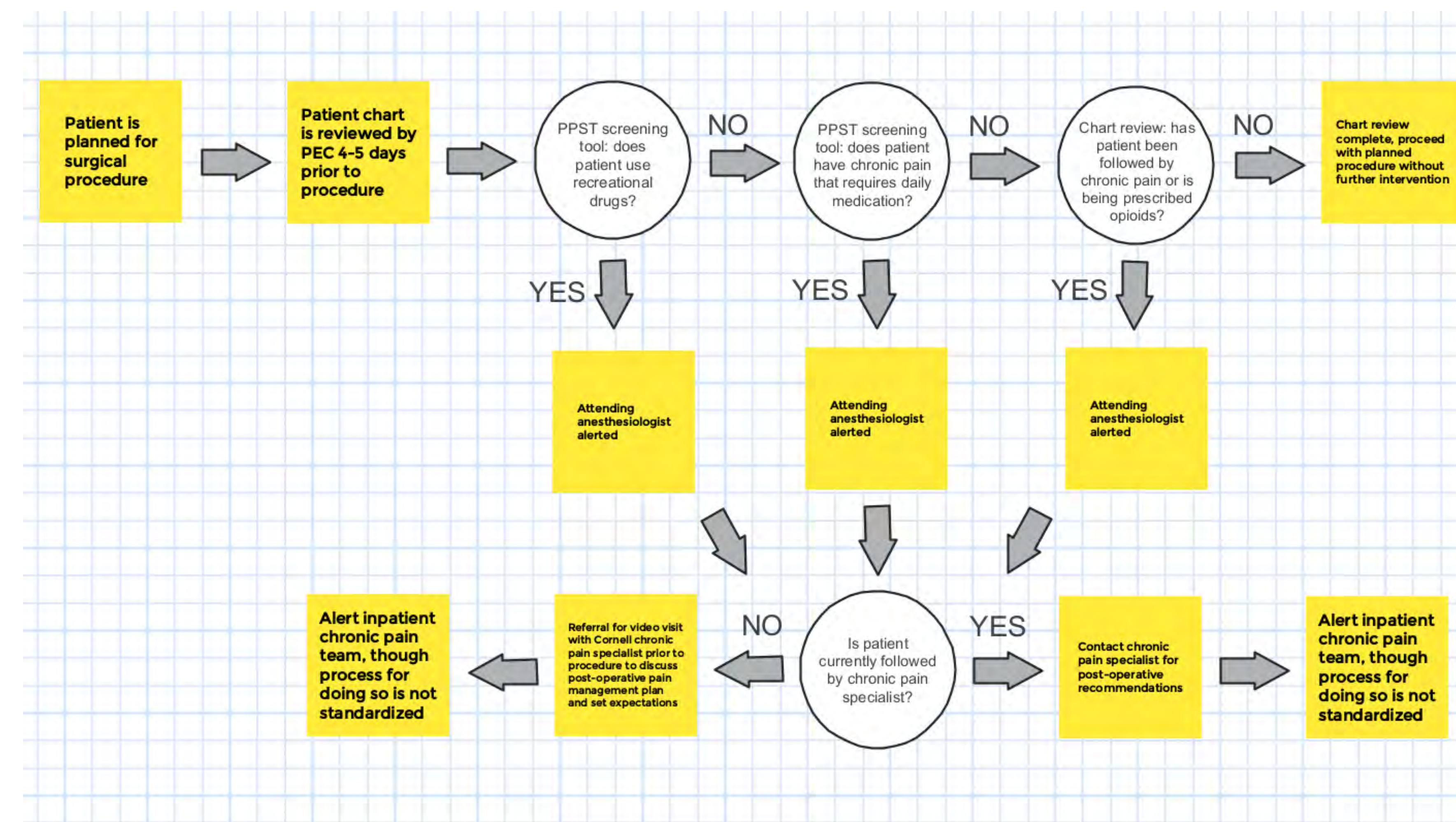
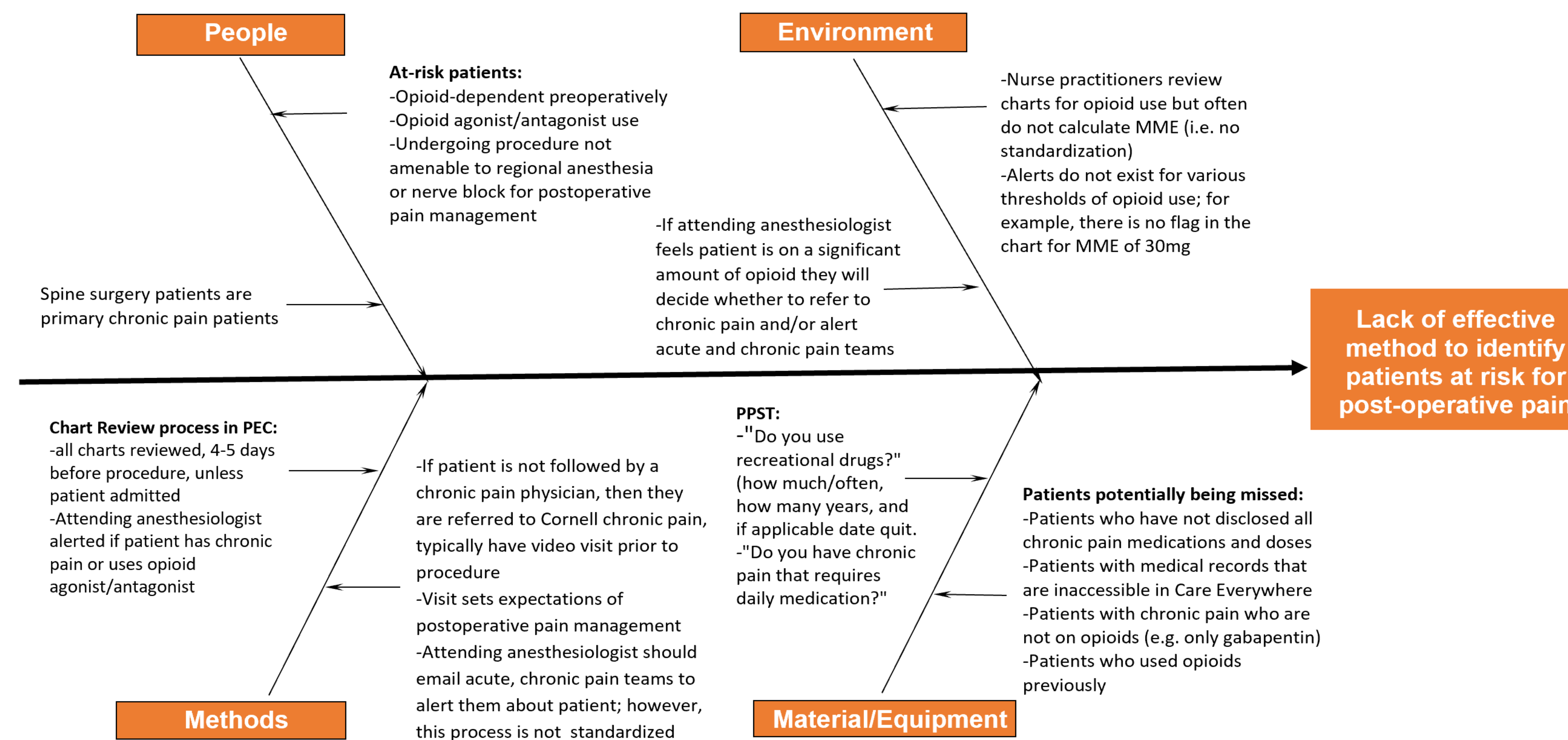
Aims:

- Understand the **current preoperative evaluation process** in screening for chronic pain patients at NYP-Weill Cornell
- Evaluate literature** for validated preoperative screening tools
- Create a novel perioperative screening tool** to better capture chronic pain patients

Literature Review

- Two promising examples of preoperative screening tools for high-risk of prolonged perioperative opioid use or difficult to control pain were uncovered.^{1,2}
- However, no data on the implementation of a screening tool to detect patients currently with chronic pain were found.
- Interviews** with leadership at the **Pre-anesthesia Evaluation Center (PEC)** to determine current processes for screening preoperative patients for chronic pain and opioid use

Current Pre-operative Evaluation Clinic Workflow and Challenges



New questionnaire



Pre-Operative Evaluation of Patients with Chronic Pain Survey Questions:

- Do you use alcohol (>14 drinks/week) or recreational drugs?
a. Yes
b. No
c. Unsure
- Have you seen a physician for chronic pain in past 6 months?
a. Yes
b. No
c. Unsure
- Are you on any daily medication for chronic pain? (anti-depressants, antiepileptics, opioids)
a. Yes
b. No
c. Unsure
- Have you taken prescription or non-prescription opioids in the last 6 months?
a. Yes
b. No
c. Unsure
- Do you take buprenorphine or methadone?
a. Yes
b. No
c. Unsure

Additional Comments:

Future Directions

- Select appropriate patient cohort for implementation
 - Spinal surgery patients:** 368 patients had an outpatient pain clinic appointment in 2021 followed by surgery between Jan and June 2022.
 - Of these, 65 patients (18%) had spinal surgeries
- Interview** stakeholders (e.g., preoperative clinic staff, outpatient chronic pain teams, inpatient perioperative pain teams) to assess acceptance and success of implemented changes

1. Allen D, et al. Journal of Shoulder and Elbow Surgery. 2019. 28(11):2225-2231.

2. Yi Zhang, et al. The Spine Journal. 2020. 20(8): 1184-1195.

Improving Incentive Spirometry Use in the PACU

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Purpose

Postoperative pulmonary complications are common and may lead to adverse patient outcomes, such as early postoperative mortality, ICU admission, and prolonged hospital stay.

Incentive spirometry is a simple and cost-effective method to prevent atelectasis in postoperative patients, improving postoperative oxygenation and decreasing postoperative pulmonary complications.

Problem: Incentive spirometry (IS) use in the PACU is not standardized.

Goal: To increase IS use in PACU by 15% in a 4-month period.

Investigation Methods

Literature Review:

- Postoperative pulmonary complications (PPCs) are common and lead to adverse patient outcomes, such as postoperative mortality, ICU admission, and prolonged hospital stay.
- Poor patient compliance/ failure to use IS as prescribed is a limitation in RCTs

Chart Review

- 40 PACU patients reviewed from May 14 – June 21, 2021
- 45% (n=18) patients had IS ordered for use in the PACU
 - 7 of the 18 patients had IS documented during their PACU stay

Chart Review Results

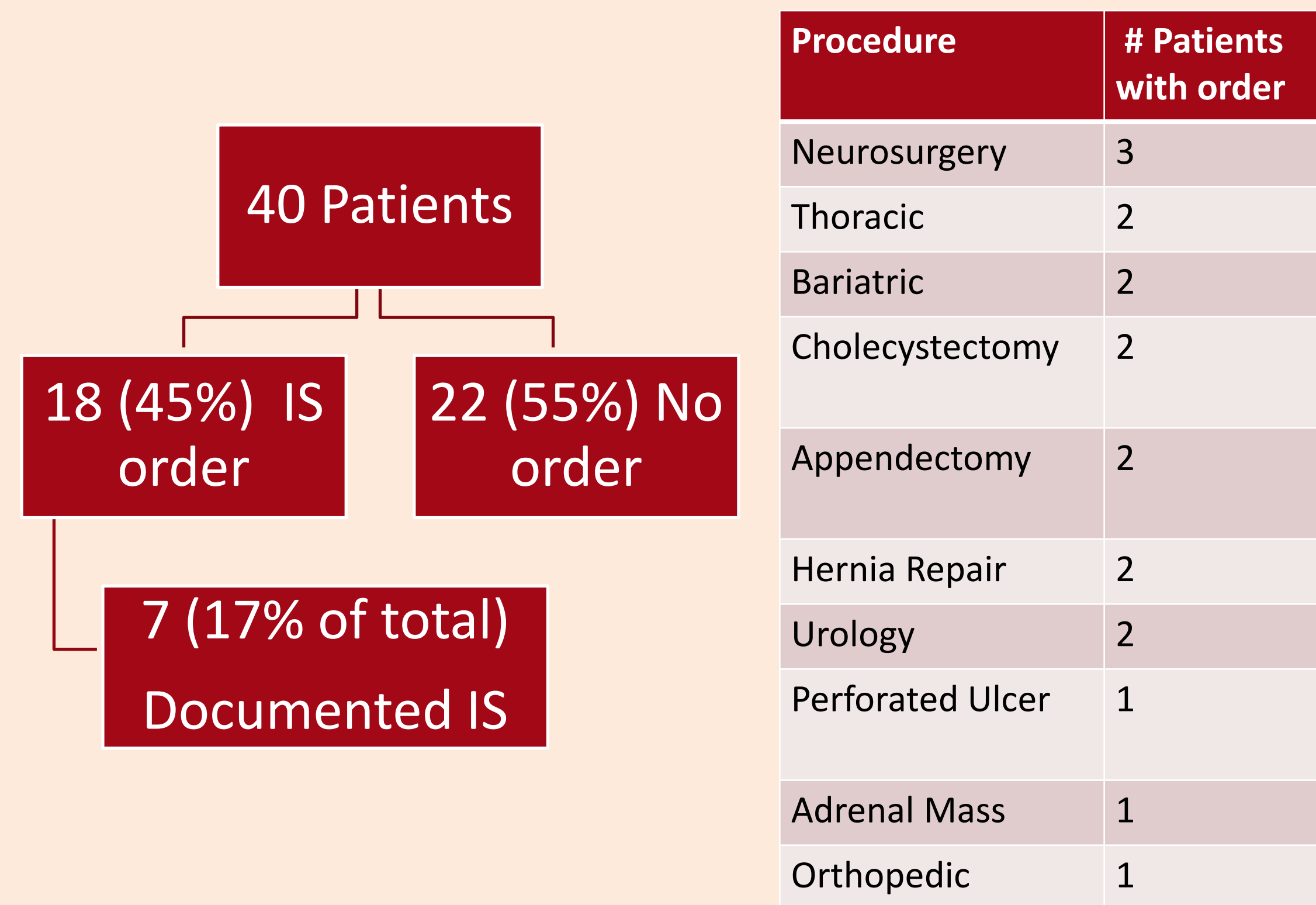
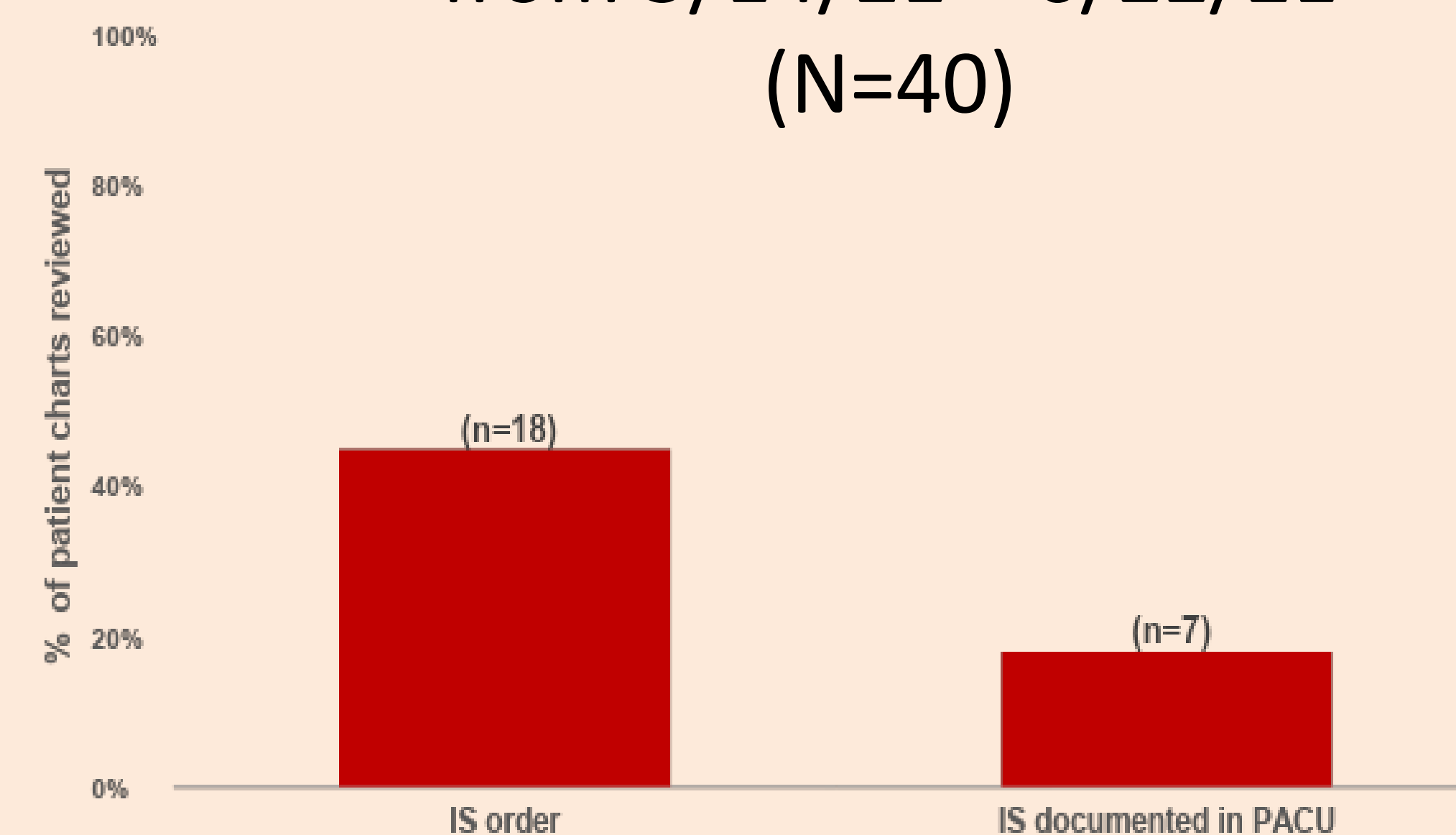


Chart review data credit: Jolanta Zabielska, RN

Incentive Spirometry Utilization in PACU

Incentive Spirometry Orders in PACU from 5/14/21 – 6/22/21 (N=40)



Proposed Interventions

- Add incentive spirometry to anesthesia PACU order set
- Coordinate with hospital supply chain to increase IS supply
- Provide education on IS documentation for nursing staff

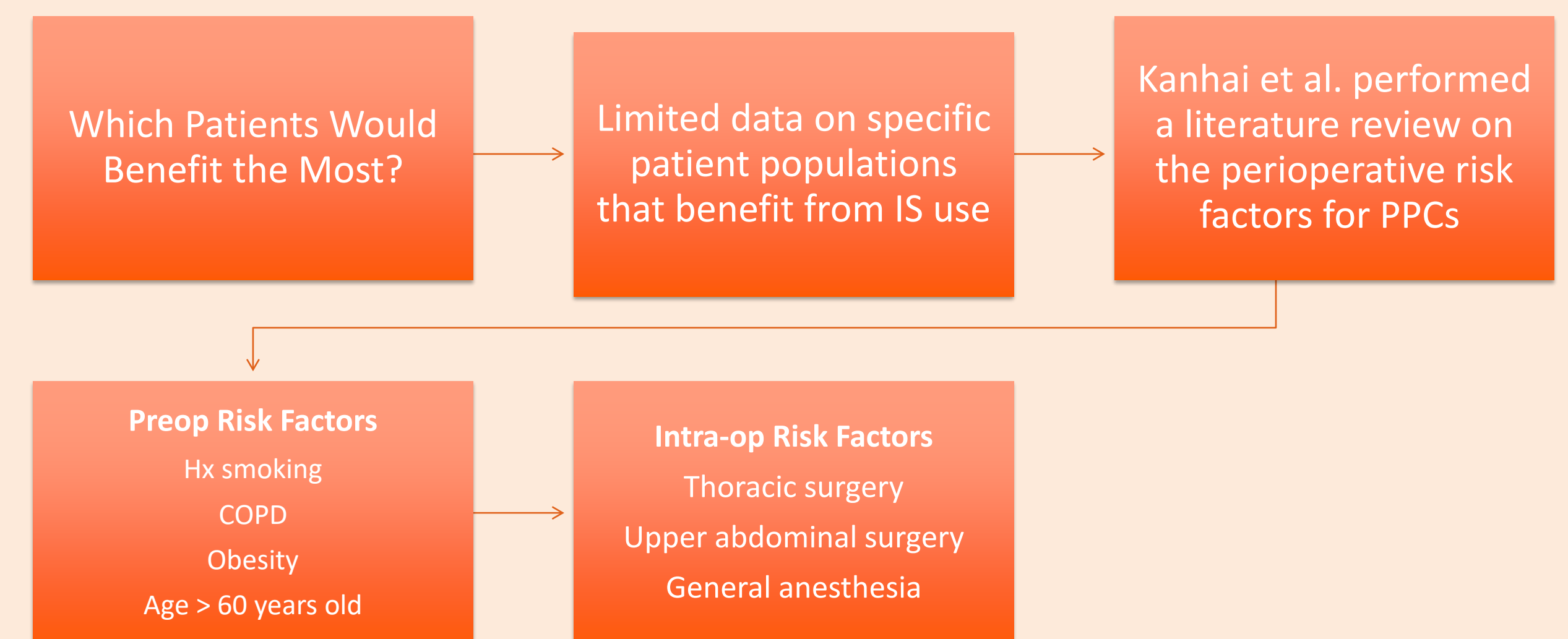
Additional Considerations



The incentive spirometer is made of plastic, and unnecessary use may contribute to environmental damage.



Decide who would benefit the most from postoperative IS, weighing the benefit to patient care against the environmental risk posed by excessive plastic use.



Next Steps

Create recommendations for which patients should be prioritized to have postoperative IS.

Present recommendations to departmental Clinical Practice Committee.

A final recommendation will be presented to the NYP enterprise for adoption into the PACU order set.

Fishbone Diagram

