Advanced Practice Providers in Surgical Critical Care

Quality Improvement

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Objectives

Describe how to design a successful QI project in the ICU

Design methods for health service delivery

Describe QI innovative designs that give quick results

Case examples describing both challenges and solutions

Encourage future APP outcome assessment projects in the ICU

Why is this important?

“Without change there is no innovation, creativity, or incentive for improvement. Those who initiate change will have a better opportunity to manage the change that is inevitable.”

-William Polland

Advanced practice providers are uniquely prepared to improve science and innovation in this setting and shape their future role
Gearing up

- Always room for improvement; What’s your big idea!? 
- Might academic theory be helpful to organize yourself?

- Plan ahead…
- What metrics are you hoping to move?
- Who are the stakeholders?
  - Onboard them in the planning process
- Will this significantly change the workflow?
- Consider writing it up!... you’re already doing the hard work!
  - When to consider:
    - IRB
    - Stakeholder panel
Organizational theory

- Health care is a complex environment
- Identifying relationships early-on will help planning
- And if you take the leap of identifying a model: research analysis, prediction modeling, and conceptual soundness

Minnick et al. Outcome Model from Kleinpell, 2017
Basic design structures

**Build Comparisons**

In order to see how far you’ve come, you must have data (or a patient group) to compare your outcome results to:

- Identify intervention effect
- Build causal inference
- But lacking the ability to randomize the sample

**NEGD**

Nonequivalent groups design— is the most frequently used design in health care: Pre-Post test

*Also— Proxy Pretest design

**Separate Pre-Post**

Pre-test sample is not the same as the post-test sample

**Switching-Replications**

Two group, two phase with three data collection periods

**NEDV**

Nonequivalent dependent variables design—a single-group pre post design with two outcome measures, only one outcome measure is predicted to affect the intervention. (A more complicated version involves pattern matching).
Your idea, your assumptions...

- **Desirability**: Do people want it?
- **Feasibility**: Is it technically and operationally feasible?
- **Viability**: Is it financially viable?

**What is an assumption?**

An assumption is something that must be true for your solution to work.

Testing assumptions can help you de-risk solutions before you invest too many resources.
Prioritize Assumptions

Not all assumptions are created equal

Focus on assumptions that:
• Are less certain to be true and crucial to your solution
• Will help you learn more about both the solution and the problem

- **I AM SURE**
  - this is true
- **DEVASTATING**
  - if you’re wrong
- **NO IDEA**
  - If this is true
- **NO BIG DEAL**
  - if you’re wrong

Pull stakeholders together

If you’re wrong

- **DEVASTATING**
- **NO IDEA**
- **NO BIG DEAL**
Assumptions in action

What might be anticipated in the creation of a post ICU follow-up program?

- **DEVASTATING** if you’re wrong
- **I AM SURE** this is true
- **NO IDEA** if this is true
- **NO BIG DEAL** if you’re wrong

- Patient satisfier
- Care will be taken away from ICU patients
- Need to track the right metric
- Identifying the right patients
- More patients bounce back
- Increased APP workload
Design a mini-pilot

Fairy God Mother
- Identifying problem drivers. What do people really need?

Vapor test
- Testing for demand. Do people care? How much?

Fake front-end
- Testing the different features of your solution. How should it work?

Fake back-end
- Testing components of your solution in a sustainable way, to measure value. What would happen?

One night stand
- Testing the actual solution for a very short period of time. What does happen?
PDSA, rapid cycle QI

1. Getting the right concept
2. Matching & making the right resource
3. Finding the right outcome to measure

- Vapor Test
- Fake Front End
- Fake Back End
Pilot blueprint

**Team formation**
Identify stakeholders and outcome of interest

*First meeting*

**Problem statement**
Develop with the assumption board
Leave meeting with a clear problem statement
Consider other stakeholders

*Second meeting*

**Proposed solution**
Use the assumption board
Plan intervention - mini pilot
Have a plan for identified barriers

*Third (or more) meeting*

**Riskiest assumptions**
Control for the obvious!
Test: qualitative & qualitative data
The working phase

**Lessons learned**
Report results: work with the positive, BUT don’t forget the negative for future work

Configure next step

Variable
Outreach

- **Description:**
  High risk SCC patients are seen 24 to 48 hours post ICU discharge by an SCCS APP to bridge communication and follow-up concerns with the primary surgical team.

- **Theory:** Labor Input (Quality) > Employee Behavior > Patient Experience > Outcomes

- **Design:** NEGD, pre-post intervention—retrospective baseline data.
Outreach

- Primary goal is to reduce the mortality of patients readmitted to the SICU by intervening on critical care issues earlier.
- Secondary aim is to bridge communication on high risk patients.
- PDSA: STRESS score


Database & monthly report card

- **Know your own data!**
  - Challenges with the electronic patient attribution system

- **Description:**
  - Surgical critical care demographic and complication tracking completed by the APP group daily and reported out monthly to the attendings, fellows and residents.

- **Goal:**
  - Primary aim is to track quality and complication rates from month-to-month to highlight opportunities for internal improvement. Secondary aim is to have a reliable data-set for variance explanations in length-of-stay, cost or other administratively mediated variables.

- **Theory:** Capital inputs > Organizational facets > Labor inputs (quality & quantity) > Patient characteristics > Patient outcomes
Database & monthly report card

- Knowing your data—allows you to “control” for…
Green Sheet

- **Description:**
  - Surgical patients discharged from the SICU in conjunction with the outreach program are enrolled into a coordinated respiratory and primary surgical team early intervention. Patient can only be enrolled on select surgical wards that are trained on the process. Within the first 2 hours of floor admission, then daily for 72 hours, RT and Primary Team must address the identified issues and goals written on the Green Sheet and communicate with the RN at these identified times.

- **Goal:**
  - Project goal is to proactively intervene on respiratory related needs that high risk patients have when transitioning from the SICU to the floor. Increased communication and multidisciplinary approach aims to prevent respiratory decline.
Green Sheet

- **Theory:** Organizational facets > Labor inputs (quality) > Patient experience > Outcomes

- **Design:** Separate Pre-Post Design
  - Pre (chart and database review)
  - Post (prospectively collected data)

Bedside echo: education design

- **Description:**
  - Bedside critical care echo curriculum established to validate the accuracy of echo view attainment and interpretation. APPs and Fellow MDs are required to attain 25 recorded echos that are logged with interpretation approval of certified echo proceduralist. Each APP and MD Fellow is required to present three of their findings at the echo conference for further discussion and validation by a trained cardiac echo physician.

- **Goal:**
  - Primary goal is to establish a dedicated curriculum for bedside echo attainment for critical care providers.

- **Some QI projects are as simple as this!**
- **Theory:** Labor input: Quality: APP & Fellows
Mortality review: case study

Description:
- Systematic retrospective chart review of all mortalities at HUP and PPMC on the surgical critical care service. All deaths are reviewed by SCCS APPs and SCCS MD fellows for potentially preventable systematic concerns for improvement.

Goal:
- Primary aim is to develop a focused systematic intervention for process vulnerabilities. Secondary aim is to compare the vulnerabilities by APP model (PPMC vs HUP model). Tertiary aim is to develop a secondary quantitative tool that captures patient and system variables for quantitative comparison.

- Theory: Organization Facets vs Capital Input vs Labor Input (Quant & Quality)
- Design: Cross-sectional, Case study style
  - Building aggregate data to find systemic issues
  - Examining for “potentially preventable” systemic issues
Patient & family ICU experience

- Different from the traditional Quasi-experimental design...
- Initial Question:
  - How can we improve the patient and family experience in the Trauma Surgical ICU?
- Methods:
  - Qualitative exploratory design
    - IRB approved
    - Patient & family interviews
    - Care observations and contextual field notes collected for analysis
Patient & family ICU experience

- Patient & Family Selection
  - Purposeful sample limited to patients/families receiving care in the TSICU
  - Selection plan involved dyads of patients who had potential polar opinions:
    - Low acuity vs high acuity
    - Short stay vs long stay
    - Happy vs hostile
    - Planned admission vs unexpected trauma
    - Strong patient participant vs patient requiring family advocacy
    - Involved family with ICU presence vs family who is unable to be present in ICU
Patient & family ICU experience

• Eight interview questions
  – Overall satisfaction addressed
  – Patient and family expectations
  – Care coordination
  – Physical location accommodations
  – Where to get questions on the care plan answered
  – Frequency of updates
  – Medical care plan comprehension
  – Preparation for transition from ICU

• Observations
  – One hour observation period
  – Captured patient care activities, communication patterns, care environment and physical lay-out
Patient & family ICU experience

- **Content Analysis**
  - Group validation process for content condensation
  - Inter-rater agreement of concepts through:
    - Affinity Mapping
    - Positive to Negative organization chart organization
      - By patient, family and observation
  - **Major Themes**:
    - **Environment**
      - Food (no coffee on floor, food/meal tray issues)—all reported directly from patient or family
      - Noise—ONLY noticed by the observers
      - White boards not updated, ONLY noticed by observers
    - **Communication**
      - Who is my provider?
      - What is my care plan?
      - Expectations
      - Rounds/how do I get updated
      - Patient education
Patient & family ICU experience

Family Intervention Survey:
- Based on content analysis themes of communication and the environment, a random sample of patients and families are filling out a short ranking survey on their preference of interventions:

- _____ When I (the patient) will be able to eat
- _____ When I (the patient) will be able to get out of bed
- _____ When I and/or my family will be able to talk to my doctor
- _____ When I (the patient) will have tests and/or procedures
- _____ When I (the patient) will be able to go home
- _____ When my family can visit
- _____ When I (the patient) will be able to sleep
- _____ How my (the patient’s) pain is being controlled
- _____ Who can we expect to enter the room
Patient & family ICU experience

❖ Focusing on an Intervention
  – Based on the top three ranked attributes
    ○ #1 When will I be able to eat?
    ○ #2 When can my family visit?
    ○ Tied for #3:
      – When will I be able to get out of bed?
      – When will I be able to go home?

❖ Assumption Mapping
  • We used the vapor test/fake back end to understand our resources and the feasibility of these areas
    – Nursing to address some family info
    – Led us to change our focus related to:
      ○ Resources and feasibility
Patient & family ICU experience

- Globally, increasing family communication was a theme noted
  - We have decided to apply to the
    - “Preparation for discharge from the ICU”
    - Creating a more seamless transition with education by a “transition liaison”

- Assumption Mapping
  - Group is working together to build assumption board
  - Plan to maximize resources and set-up with the anticipation of the “extreme events”
Palliative care communication

- **Description:**
  - Multidisciplinary intervention that will aim at APPs supplementation of palliative care discussions for patients and families. The project is being reviewed by the Rhoads 5 UBCL and palliative care in conjunction with project lead APP.

- **Goal:**
  - Aim to have a project hard trigger for a mandatory palliative care intervention, but re-brand it with a new APP name that supplements patient and family needs in the SICU.

- **Design:** Mixed-Method: Separate pre-post intervention & education design with a NEGD pre-post provider section

- **Theory:** Organizational Facets > Labor input quality

