

# Advanced Practice Providers in Surgical Critical Care

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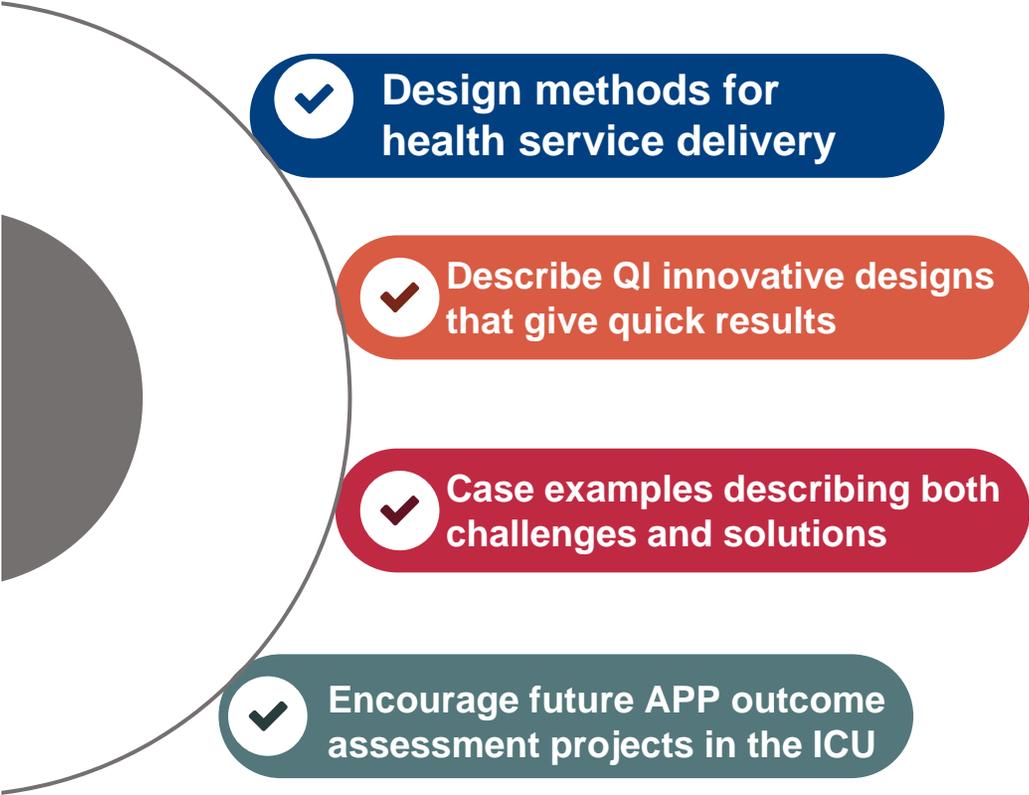
## Quality Improvement

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# Objectives

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## 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**

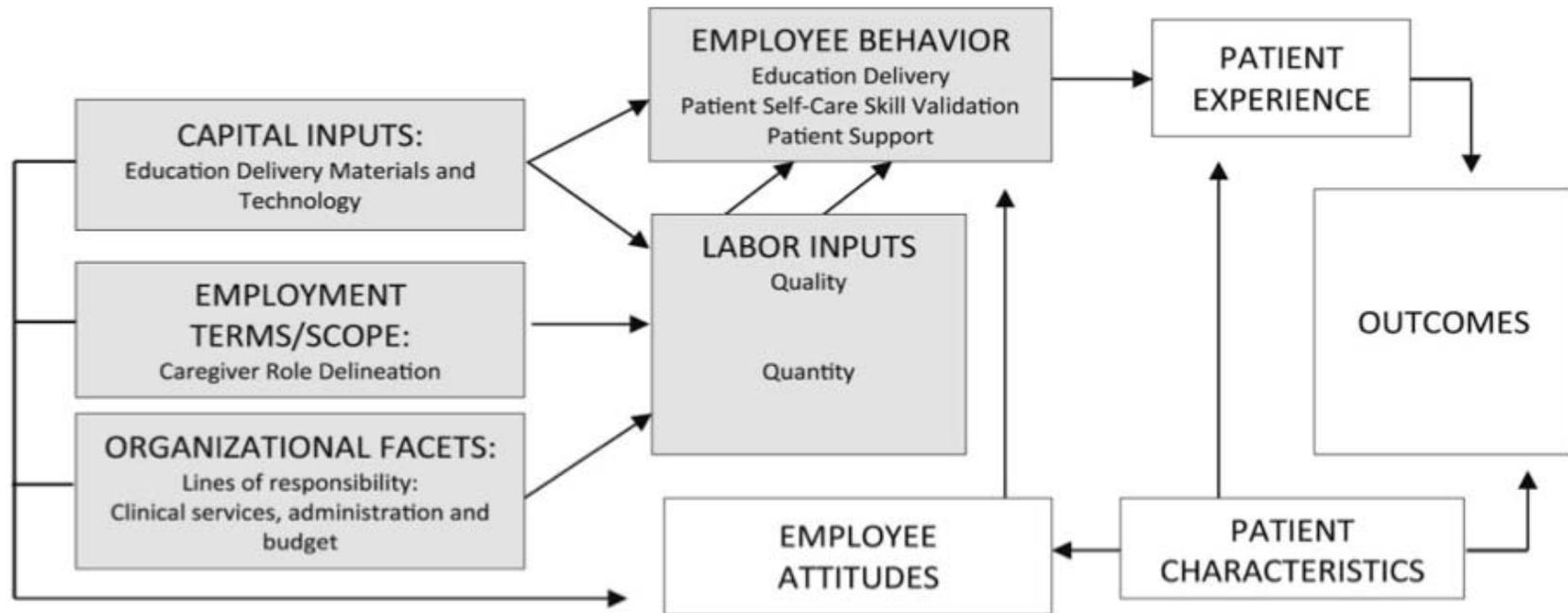
# Gearing up

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- ◆ **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



1

### *NEGD*

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

\*Also— Proxy Pretest design



2

### *Separate Pre-Post*

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



3

### *Switching-Replications*

Two group, two phase with three data collection periods



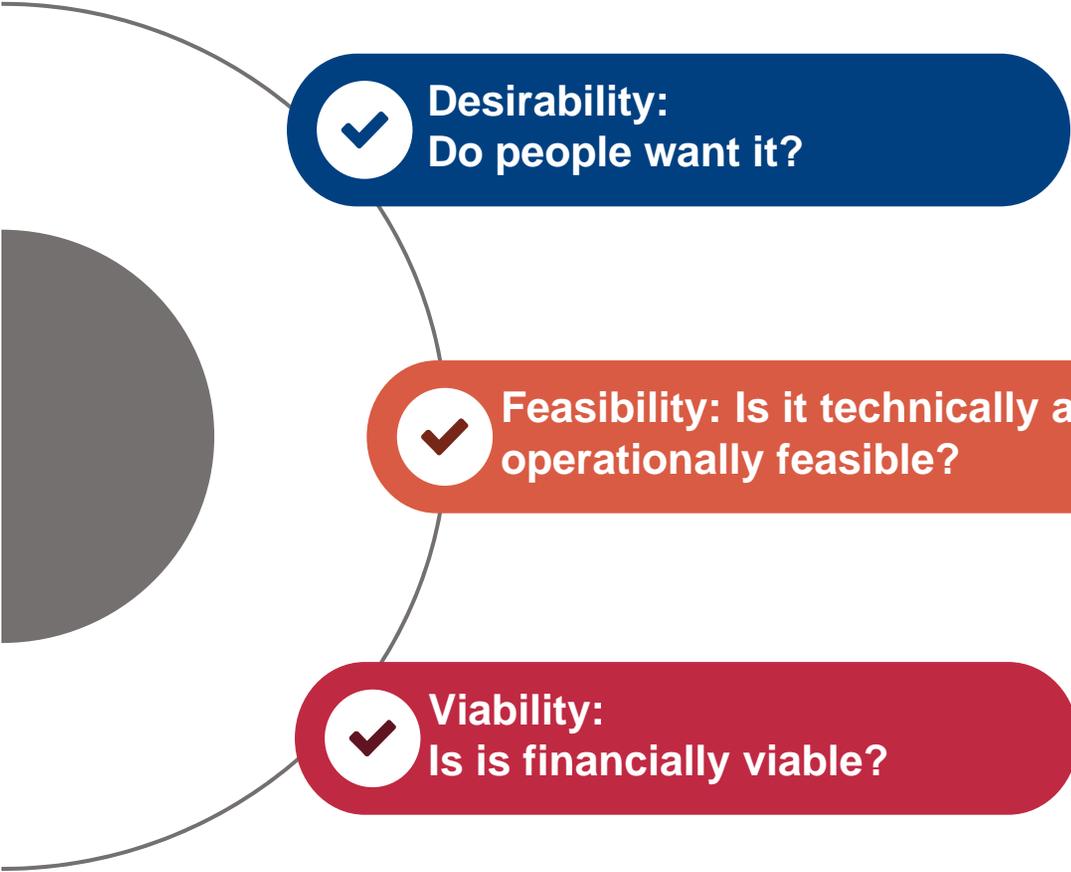
4

### *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...

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✓ **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**

# Pull stakeholders together

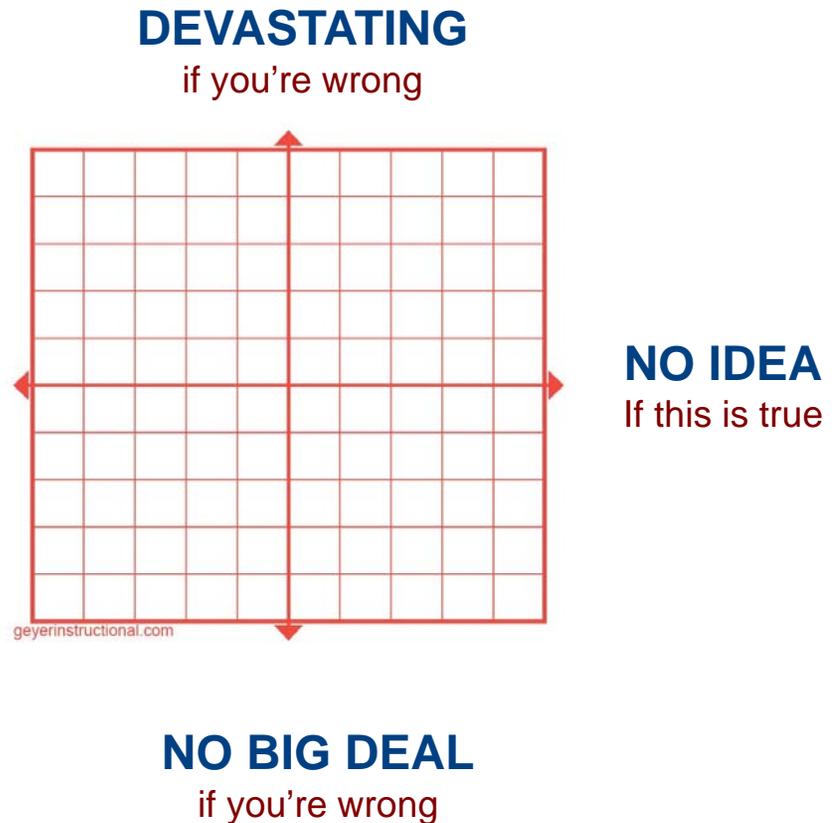
## Prioritize Assumptions

Not all assumptions are created equal

Focus on assumptions that:

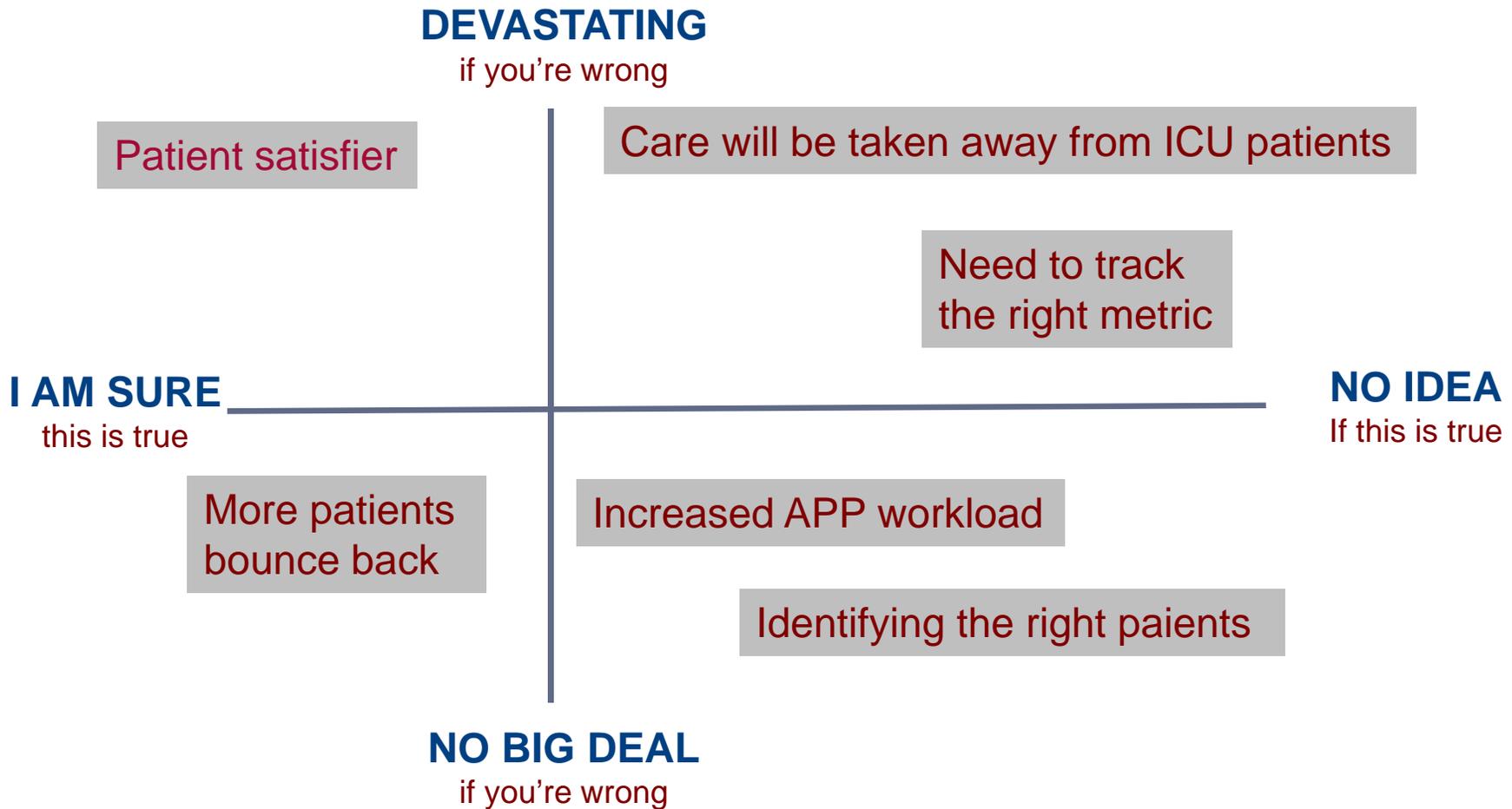
- Are less certain to be true and crucial to your solution
- Will help you learn more about both the solution and the problem

**I AM SURE**  
this is true

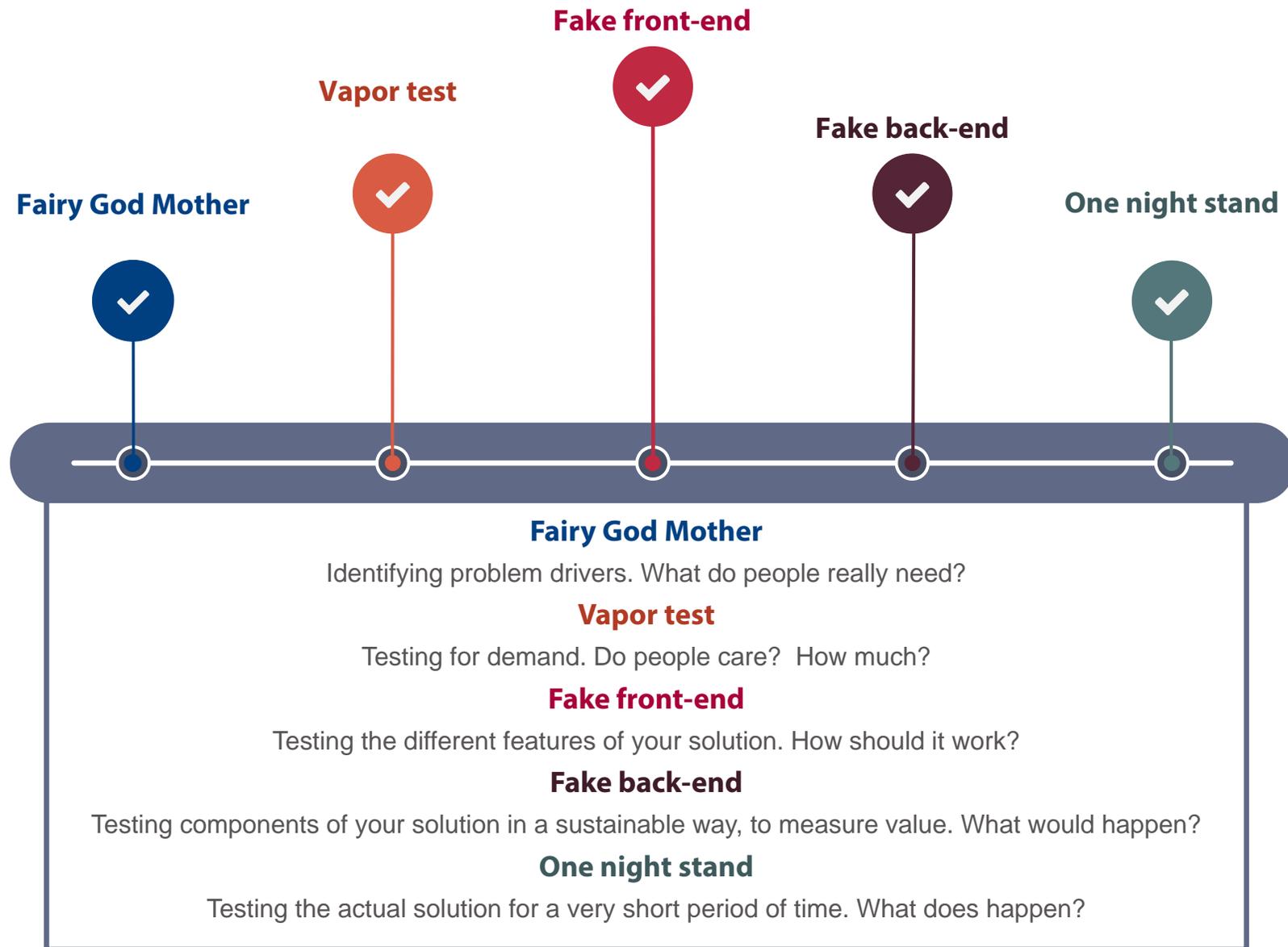


# Assumptions in action

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

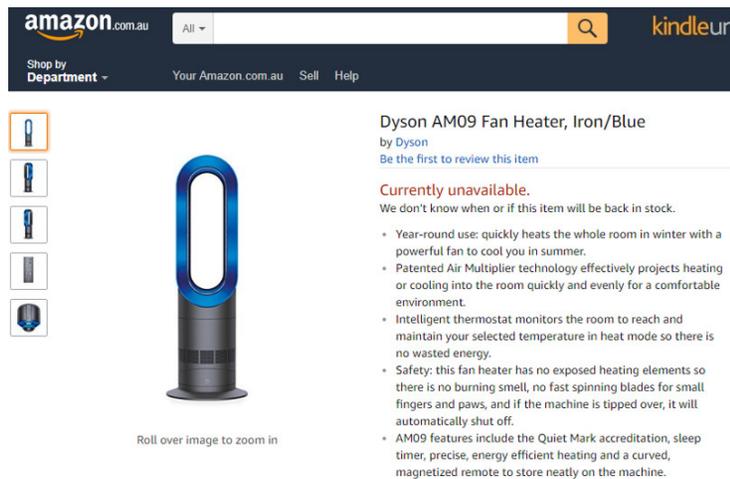


# Design a mini-pilot



# PDSA, rapid cycle QI

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



The screenshot shows the Amazon.com.au product page for the Dyson AM09 Fan Heater. The page header includes the Amazon logo, a search bar, and navigation links. The product title is "Dyson AM09 Fan Heater, Iron/Blue by Dyson". Below the title, it states "Currently unavailable" and "We don't know when or if this item will be back in stock." A list of features is provided, including year-round use, patented Air Multiplier technology, intelligent thermostat, safety features, and Quiet Mark accreditation. A small image of the fan heater is shown on the left, with a "Roll over image to zoom in" prompt below it.

amazon.com.au All  kindleun

Shop by Department Your Amazon.com.au Sell Help

Dyson AM09 Fan Heater, Iron/Blue  
by Dyson  
Be the first to review this item

**Currently unavailable.**  
We don't know when or if this item will be back in stock.

- Year-round use: quickly heats the whole room in winter with a powerful fan to cool you in summer.
- Patented Air Multiplier technology effectively projects heating or cooling into the room quickly and evenly for a comfortable environment.
- Intelligent thermostat monitors the room to reach and maintain your selected temperature in heat mode so there is no wasted energy.
- Safety: this fan heater has no exposed heating elements so there is no burning smell, no fast spinning blades for small fingers and paws, and if the machine is tipped over, it will automatically shut off.
- AM09 features include the Quiet Mark accreditation, sleep timer, precise, energy efficient heating and a curved, magnetized remote to store neatly on the machine.

Roll over image to zoom in

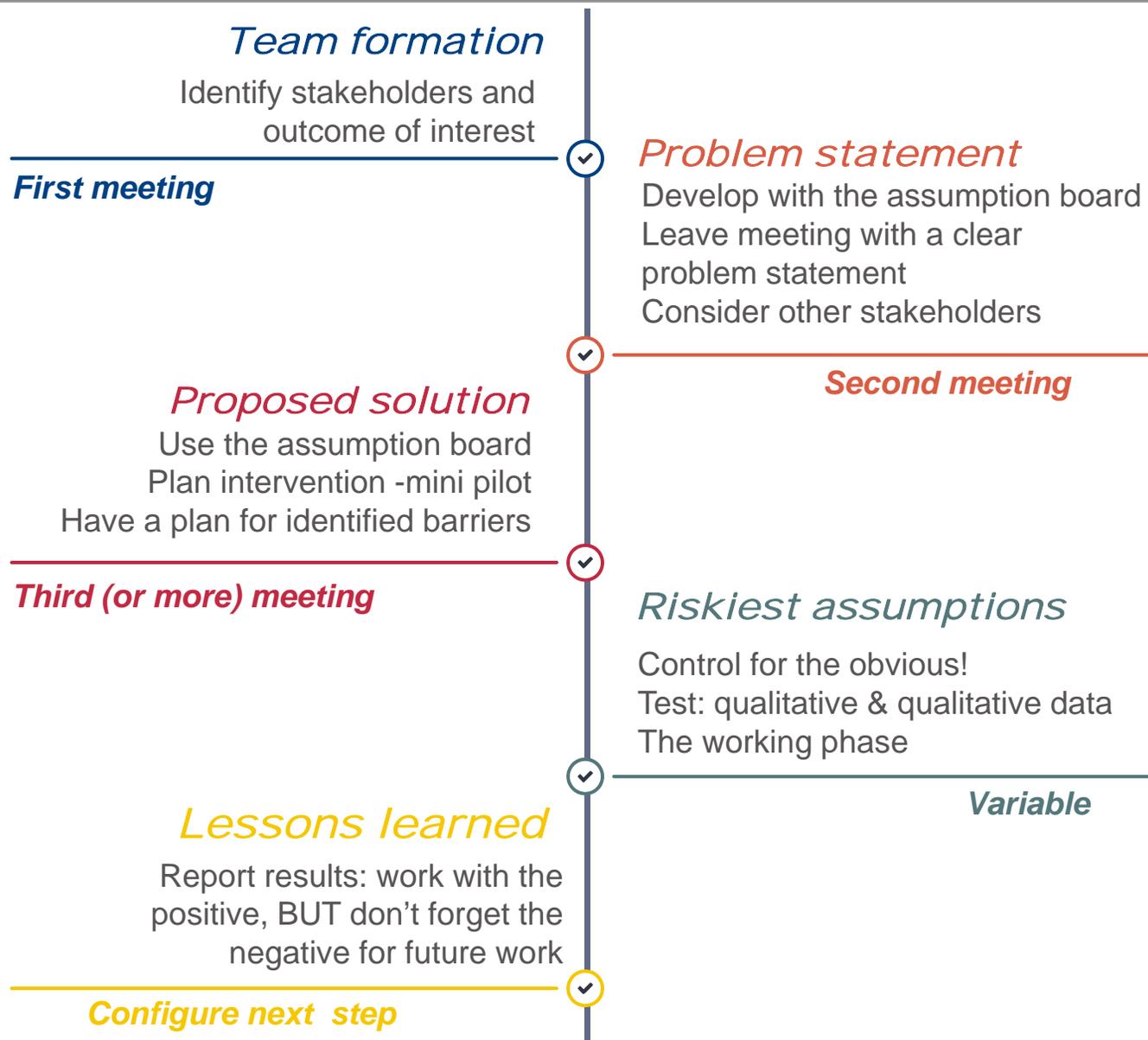


The advertisement features a blue and green background. On the left, there is a framed image of a woman in a blue uniform attending to a patient in a hospital bed. The text "READY WHEN YOU ARE." is written in large white letters, and "Same Day CT & MRI Services" is written in smaller white letters below it.

READY WHEN YOU ARE.  
Same Day CT & MRI Services

- Vapor Test
- Fake Front End
- Fake Back End

# Pilot blueprint



# Outreach

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- ◆ **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

Pisa, M., Collins, T., Robertson, M., Sicoutris, C., Saucier, J., Bushan, N., . . . Kohl, B. (2012). Use of a critical care nurse practitioner-driven critical care outreach initiative to reduce readmission mortality. *Crit Care Med*, 40(12), 204.

Pisa, M., Collins, T., Saucier, J., Holena, D., Sicoutris, C., Reilly, P., . . . Martin, N. (2014). STRESS (subjective transfer risk evaluation severity score) accurately predicts ICU readmission. *Crit Care Med*, 42(12), A1553.

Penn Medicine Hospital of the University of Pennsylvania

Label Area

**SURGICAL CRITICAL CARE OUTREACH**

Date: \_\_\_\_\_ Time: \_\_\_\_\_ (AM / PM)  
Date of SICU Discharge: \_\_\_\_\_

CCNP:  Tara Collins (215-873-7460)  Amanda Martin (215-847-4075)  Alexandra Pendrak (267-324-9574)  
 Mike Pisa (215-531-2399)  Jason Saucier (215-531-2549)  Corinna Sicoutris (215-964-7970)  
 Denise Zappile (215-279-1447)

Active *Issues of Concern* Upon transfer from SICU:

Neuro: \_\_\_\_\_  
 Cardiovascular: \_\_\_\_\_  
 Respiratory: \_\_\_\_\_  
 GI/Nutrition: \_\_\_\_\_  
 Renal: \_\_\_\_\_  
 ID: \_\_\_\_\_  
 Heme: \_\_\_\_\_  
 Endocrine: \_\_\_\_\_  
 Musculoskeletal: \_\_\_\_\_  
 Other: \_\_\_\_\_

Current VSS: T<sub>max</sub> \_\_\_\_\_ °C/°F \_\_\_\_\_ mm Hg \_\_\_\_\_ bpm \_\_\_\_\_ RR

I/O (past 24 hrs): \_\_\_\_\_

Assessment (areas of concern, notable labs, etc):  
\_\_\_\_\_

Issues of concern have been discussed with the primary service and/or SCC attending of the week.  
 Will recommend transferring back to the ICU  
 No recommendation to transfer back to the ICU at this time

No issues of concern were noted.

Please call with questions/concerns. \_\_\_\_\_ NP Signature \_\_\_\_\_ Print Name \_\_\_\_\_

DO NOT USE UNAPPROVED ABBREVIATIONS

SICU-005-3 AEL 6/2013

# Database & monthly report card

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- ◆ **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...

The screenshot shows a web-based data entry interface for a patient's demographic information. The patient's name is James Lowe. The form includes fields for Patient Last Name (Lowe), Patient First Name (James), Patient Middle Initial, Med Rec # (0), Surgical Service, CCS Attending, Surgical Attending, CCS Team, Apache II Score (0), Sex, Age (0), Date of Birth, and Race. There are also sections for ICU Visits and Ventilator Days, each with a table for recording data. A Complications Table is also present, with columns for Date of Comp, Complication, and Comments. The interface includes navigation and search controls for each table.

Demographic

Patient Last Name: Lowe  
Patient First Name: James  
Patient Middle Initial:   
Med Rec #: 0  
Surgical Service:   
Diagnosis:   
CCS Attending:   
Surgical Attending:   
CCS Team:   
Apache II Score: 0  
Sex:   
Age: 0  
Date of Birth:   
Race:   
ICU Visits  
Ventilator Days  
Complications  
AI CPG Anemia CPG DVT CPG Shock CPG Stress Ulcer CPG VAP CPG Labs Radiology Nutrition Analgesia + Sedation PI  
Complications Table

# Green Sheet

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- ◆ **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.**



# Bedside echo: education design

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- ◆ **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

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## 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

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- ◆ **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

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## ◆ 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

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- **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

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- **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

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## ◆ 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

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## ◆ 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

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- ◆ **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

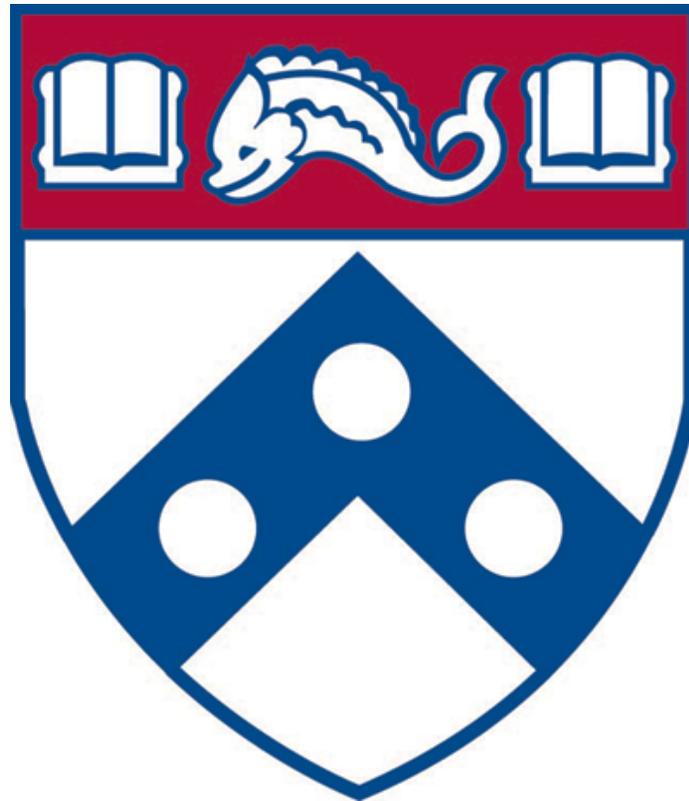
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- ◆ **Description:**
- ◆ **Multidisciplinary intervention that will aim at APPs supplementation of palliative care discussions for patients and families. The project is being reviewed by the Rhoads 5 UBCL and palliative care in conjunction with project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

# References

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- ◆ Kleinpell, R. (2017). *Outcome Assessment in Advanced Practice Nursing* (4th Edition ed.). New York: Springer Publishing Company.
- ◆ Trochim, W. M. K., & Donnelly, J. P. (2007). *Research methods knowledge base* (3rd ed.). Mason, OH: Thomson Custom Pub.



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