



# Staying Connected: A Novel Way to Secure Tubes and Drains to Reduced Patient Harm

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**Kathleen Vollman**

ADVANCING NURSING THROUGH KNOWLEDGE & INNOVATION



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# Disclosures

- ▲ Consultant-Michigan Hospital Association Keystone Center
- ▲ Subject matter expert on Catheter-associated Urinary Tract Infections (CAUTI), CLABSI, Hospital-Acquired Pressure Injury (HAPI), Safety culture for Activity Hospital Association(AHA)
- ▲ Consultant and speaker bureau
  - △ Stryker's Sage business
  - △ Baxter healthcare
  - △ Bioderm Medical
  - △ Potrero Medical

# Objectives

- Discuss nurse's role in reducing patient harm
- Outline the clinical problems with lack of effective tube securement
- Discuss strategies for improving care of tubes and drains



# Resetting the Culture

## Notes on Hospitals: 1859



“It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm.”

- Florence Nightingale

Advocacy = Safety



Protect The Patient From Bad Things  
Happening on Your Watch



Implement  
Interventional Patient Hygiene



**Hand Hygiene**

# INTERVENTIONAL PATIENT HYGIENE

- Hygiene...the science and practice of the establishment and maintenance of health
- Interventional Patient Hygiene....nursing action plan directly focused on fortifying the patients host defense through proactive use of evidence-based hygiene care strategies

**Comprehensive Oral Care Plan**

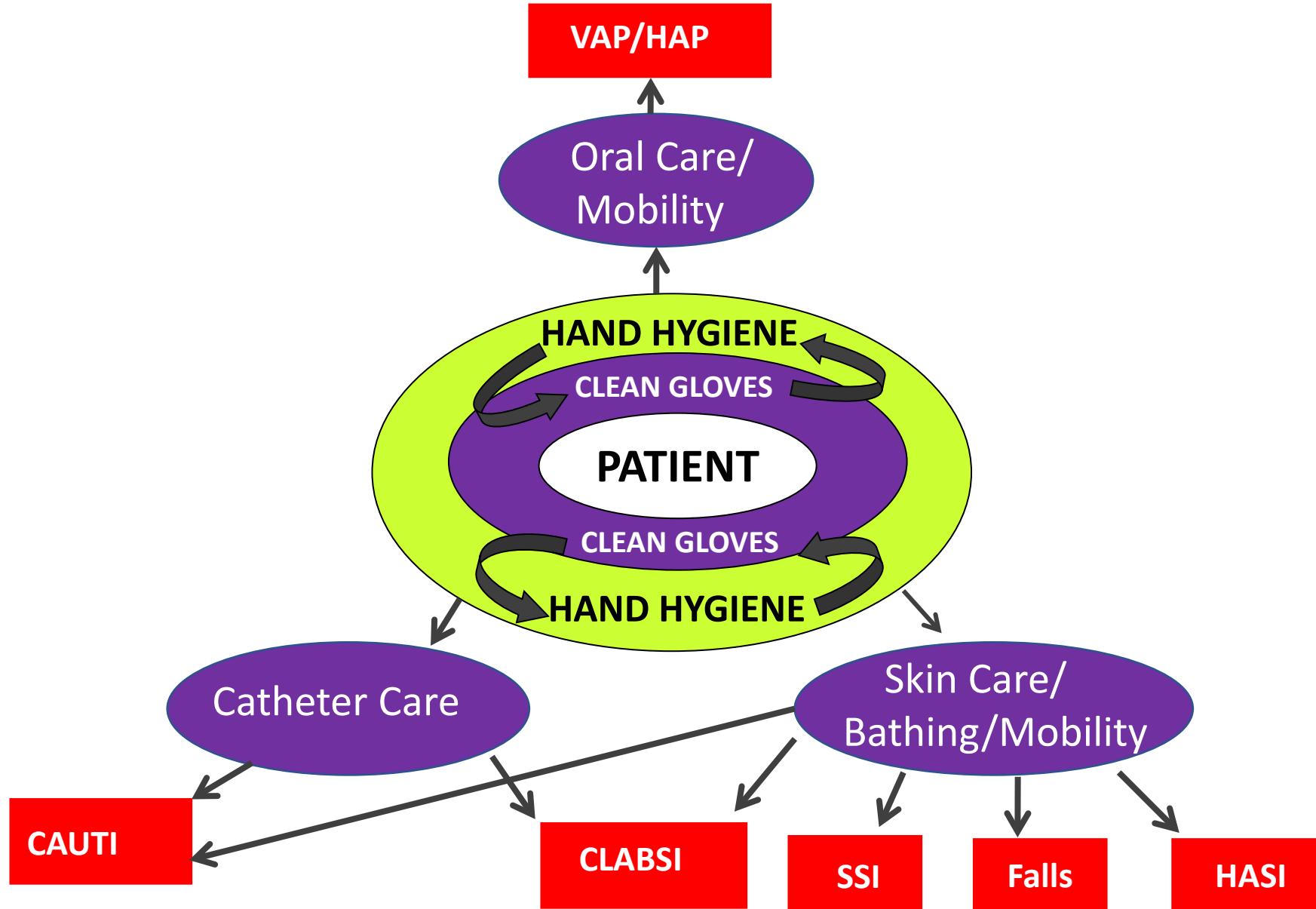
**Incontinence Associated Dermatitis Prevention Program**

**Pressure Ulcer Prevention**

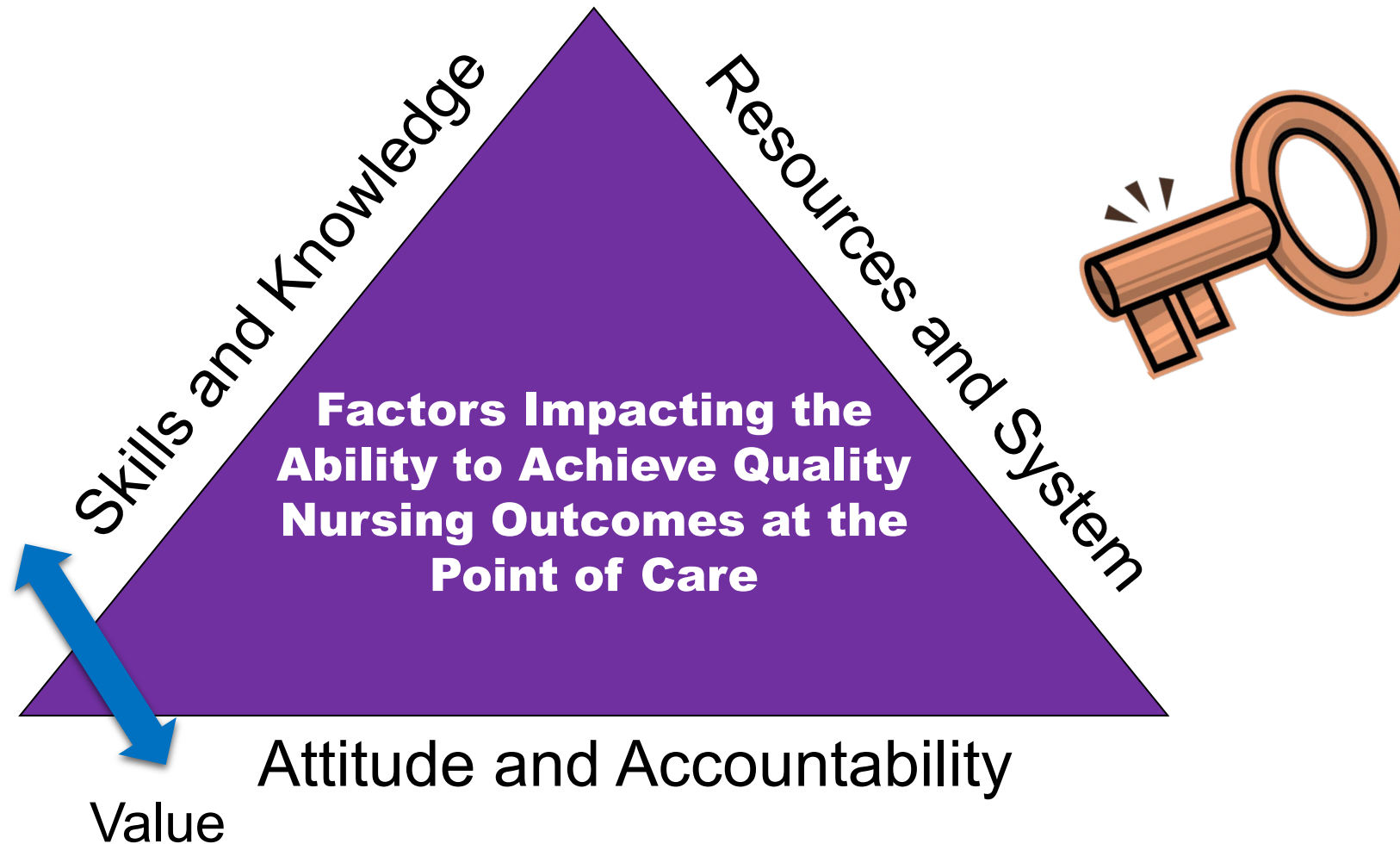
**Catheter Care**

**Bathing and Assessment**

# INTERVENTIONAL PATIENT HYGIENE(IPH)




# Achieving the Use of the Evidence






# Tubes, Tubes and More Tubes

 PEG  
tubes

 Chest  
tubes

 Urinary  
Catheters

 Surgical  
Drains

 Ventricle Assist  
Device



The role of securement for devices is to limit movement, reduce transmission of external skin bacteria into the insertion site, and reduce the occurrence of accidental dislodgement



# PEG Tubes

- ▲ Longer duration nutritional support
- ▲ External length of the tube should be marked/documentated and periodically checked
- ▲ Wait 3-6 hrs after placement to use for feeding
- ▲ Stoma/catheter care:
  - △ Clean daily with mild soap and dry site
  - △ Wk 1-2 provider may request antiseptic cleansing
  - △ Lightly cover with gauze first 1-2 weeks
  - △ Daily rotation of tube clockwise/counterclockwise to reduce pressure injury
  - △ Secure excessive tubing to abdomen
  - △ Med delivery-liquid or dissolved medications



# PEG Tubes/Complications

🔗 Complication rates range from .4% to 22.5%

## Minor

- Granuloma formations
- Wound infection
- Stomal leakage
- Catheter obstruction

## Major

- Hemorrhage
- Ileus
- Aspiration
- Buried bumper syndrome
- Tube dislodgement

Nurses Impact  
to Reduce  
Complications?

# Tube Dislodgement

- ▶ Early dislodgement 1-13.4%
- ▶ Clinical and financial burden
- ▶ Prevention:
  - △ **Secure a tube exiting the abdominal wall to the abdomen near the exit site without putting undue tension on it.**
  - △ Secure the tube's distal portion with sufficient slack on the tube to stop it from dislodging during movement.

# Wounds Infection

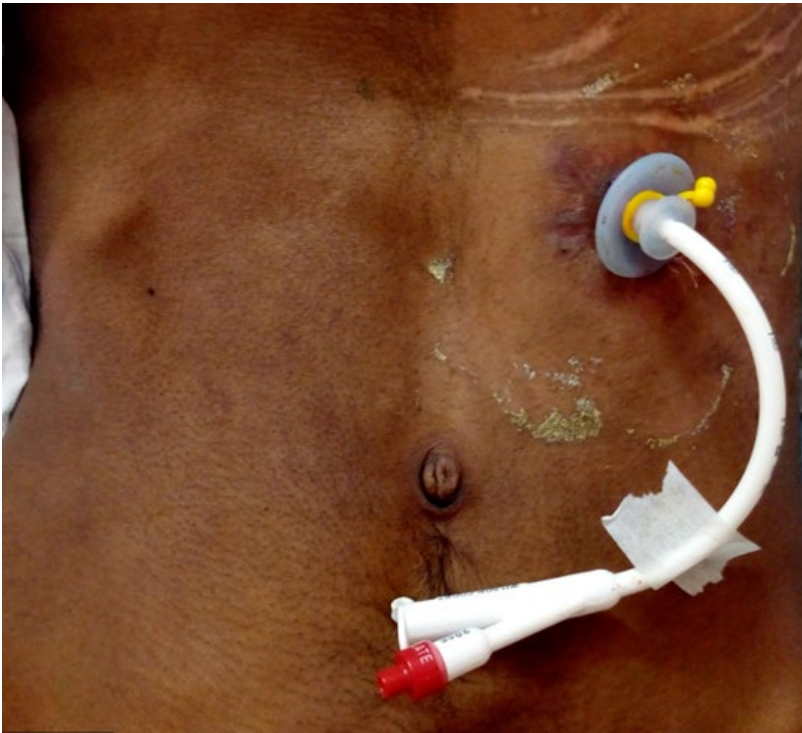
- ▶ Incidence ranges from 4-30%
- ▶ Prevention:
  - △ Regular skin and stomal care
  - △ Prevent excessive traction on the tube

# Clogging

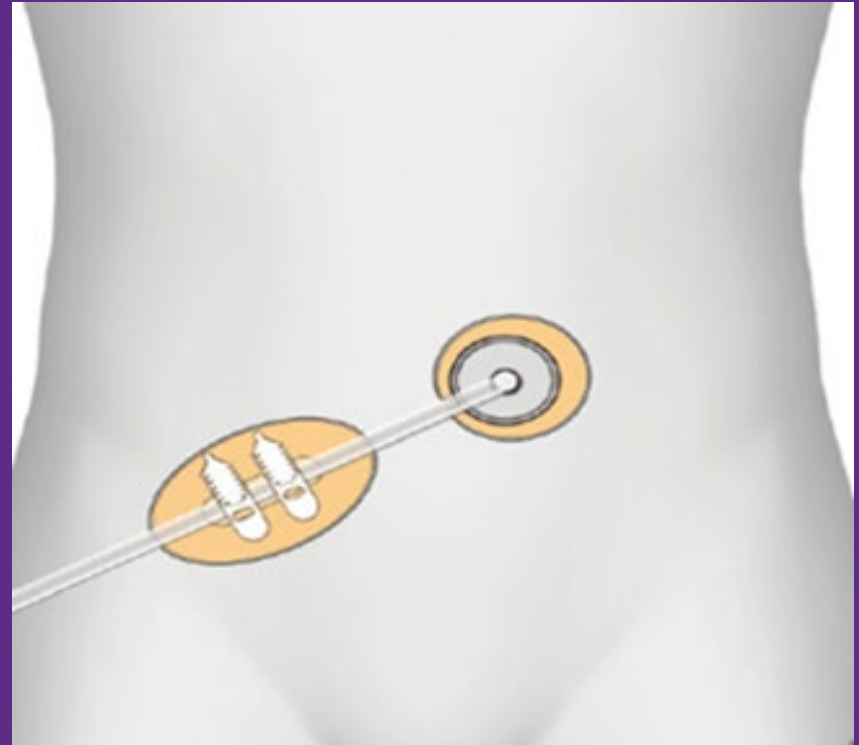
- ▶ Incidence ranges from 23-35%
- ▶ Causes: thick feeds, bulking agents, medications
- ▶ Prevention:
  - △ Flush with 40-50ml before & after medication delivery
  - △ Completely dissolve meds, or use liquid medication
  - △ Warm flushes to be most effective

# Which One Prevents Traction on the Tube?

1



2



# ECMO/VAD tubes

Artificial devices that perform partial or full support for a heart and or lungs that are unable to function adequately

## Challenges

- △ Cannula infection-16 to 24 BSI's per 1000 ECMO days
- △ Cannula anchoring
- △ Variation in dressing management and tube securement



<http://www.learnecmo.com/cannulation>

# Survey of Dressings and Securing Methods



- ▶ 396 ELSO registered ECMO coordinators
- ▶ 391 individuals responded from 45 different countries
- ▶ 76% had written guidelines for cannular dressing management
- ▶ 34% rate of dislodgement, migration and accidental decannulation over 5 years
  - △ Cause: Inadequate cannula securement methods primary cause in 28% of reported dislodgements
  - △ Other causes—patient removal, turning and transport—could be related to securement





# LVAD Driveline Dressing Change Protocols: A Need for Standardization

- 15 academic centers advanced heart failure/heart transplant centers
- Content analysis of driveline dressing protocols
- 1388 VADs implanted-median of 95 at each center
- All 15 used CHG for cleansing-no specific scrub length
- Variation in frequency dressing change
- 67% had kit with either CHG-Biopatch (70%) or Silver based (30%)

Item, n (% of 15)	N=15** institutional dressing change protocols
<b>1. The protocol states how often the dressing should be changed for a dry non-draining wound*</b>	12 (80)
a. Once a week (7 days)	5 (33)
b. Two times a week	5 (33)
c. Three times a week	3 (20)
d. One to three times a week	1 (7)
<b>2. Patient positioning: The Protocol states the appropriate/allowable position(s) for the patient to be in while the dressing change is being performed*</b>	2 (13)
a. Laying down	2 (13)
<b>3. Set up</b>	
a. The protocol state that the surface being used is clean	12 (80)
i. ii. Disinfectant (alcohol, bleach, ammonia)	9 (60)
ii. iii. Does not specify how to clean surface	3 (20)
b. Protocol lists all needed supplies	14 (93)
c. Protocol states to collect all supplies before starting the dressing change (or before putting on sterile gloves)	11 (73)
d. Uses a dressing change kit	10 (67)
e. Everyone in room dons masks	6 (40)
f. Only the procedure performer dons a mask	1 (7)
g. The patient and procedure performer wear a mask	8 (53)
<b>4. Sterile technique</b>	15 (100)
a. Protocol includes reminders on how to correctly maintain sterile technique	8 (53)
b. Hand Washing: protocol states must wash hands at some point	14 (93)
i. Specifies duration of hand washing	6 (40)
1. > or = 15 seconds <20 seconds	2 (13)

# Driveline Exit Site Care Protocols for LVAD: Systematic Review



- 11 articles met criteria for inclusion-4 to 285 patients
- 9 retrospective cohort & 2 prospective studies
- LVAD strategies:
  - △ Bridge to transplant/recovery (63%)
  - △ Destination therapy (37%)
- Significant variability in driveline exit site care
- Infection rates: average 13.8% (0-52.6%) 6-44 month follow up
- Most common organisms: Staphylococcus aureus & pseudomonas aeruginosa

# Driveline Exit Site Care Protocols for LVAD: Systematic Review



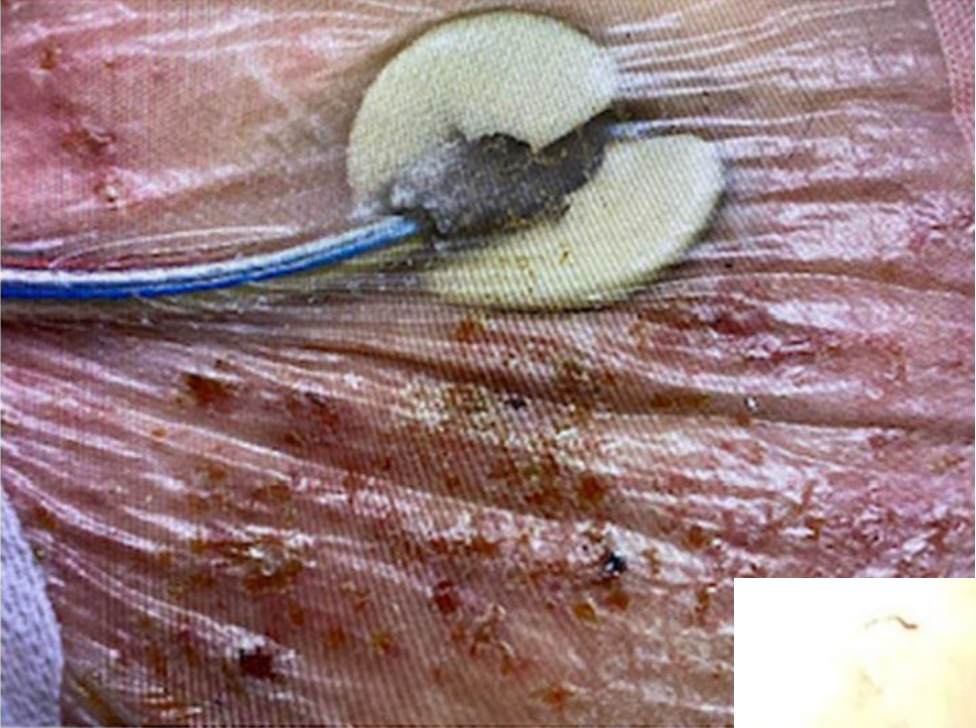
## 🔹 Driveline exit cleaning agents

- △ CHG to clean site
- △ If irritation to CHG povidone-iodine used

## 🔹 Dressing material for driveline exit site

- △ Sterile gauze & silver dressing most frequent
- △ Infection rates:
  - Silver dressing compared to sterile gauze 7.5% vs. 15.8%
  - Used CHG to clean and silver to dress first infection at 180 days
  - Foam compared to sterile gauze: 19% vs. 13%
  - Foam & CHG dressing 7.6%





# Lehigh Valley: QI to Improve Driveline Infections



## 2013-2020

- △ Driveline infection rates 19%
- △ Leads to higher mortality & frequent readmissions

## Intervention

- △ Nov 2020: Placement of a silver patch in driveline dressing kits

## Results:

- △ Nov 2020-Sept 2022: Driveline infections ↓ 19% to 0%
- △ ↓ readmissions:
  - 2021: 30% readmission r/t infections
  - 2022: 0% readmission r/t infections

# Driveline Exit Site Care Protocols for LVAD: Systematic Review



## 🔗 Anchoring Devices:

- △ When using an anchoring device, silver-based dressing and CHG cleansing infection rates 6-7.4% not till 180 days
- △ Higher when using same anchor but CHG and foam dressings: infection rates 5.4-21.3%
- △ Tapes reported higher infection: 27%

## 🔗 Frequency of Site Care

- △ Weekly with a kit, CHG cleanse, silver dressing and anchor: infection rate 6%-180 days out
- △ Daily dressing change: infection 12-13%
- △ More frequent > infections

## 🔗 Using a Kit:

- △ 2 studies:
- △ CHG cleanse, silver dressing & anchor device vs. historical group: 7.5% 180 days vs. 15.8 154 days
- △ Silver dressing and anchor device kit vs. historical gauze with no anchor: 11% reduction

# Previous Practice → New Cannula Site Care Bundle

- ▲ Variation in dressing sizes/use multiple dressings
- ▲ Biopatch too small
- ▲ Site cleaning supplies inadequate
- ▲ Differing anchor devices



- ▲ 1 - 4" x 6" chlorhexidine impregnated dressing
- ▲ 1 – cavilon barrier (medium)
- ▲ 1 – Prevantics swabstick (additional one)
- ▲ 1 Cath-grip dual anchor



## Key question

Is there a standardized left ventricular assist device (LVAD) driveline exit-site care protocol?

## Key finding(s)

This systematic review reveals a marked variability in driveline exit-site care protocols without a standardized driveline dressing technique.

## Take-home message

The LVAD driveline exit-site care protocols that include chlorhexidine, silver-based dressing and anchoring device might be best in reducing driveline infection rates.



An anchoring device should be used to prevent driveline exit-site trauma.<sup>[4,7,8,12,14,15,18,34,37]</sup>

- Silver-based dressing should be used in infected/high infection-risk wounds.<sup>[7,15,18]</sup>
- Foam-based dressing should be used in exudate wounds.<sup>[8,19]</sup>
- Sterile gauze dressing should be used in healed dry wounds as a cost-effective material.<sup>[4,8,12,15,19]</sup>



# Drainage tubes

## ▲ Purpose:

- △ Active bleeding assessment/leaks
- △ Discharge fluid or air from the body

## ▲ Variation in dressing and fixation methods to skin

## ▲ Complication:

- △ Chest tube dislodgement-32% of complications
- △ Skin injury from adhesives

## ▲ Prevention:

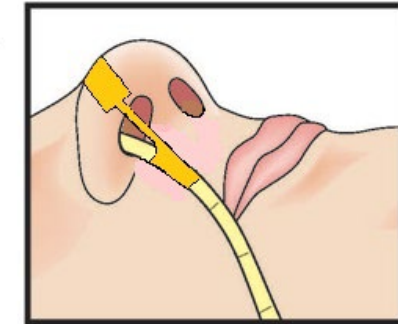
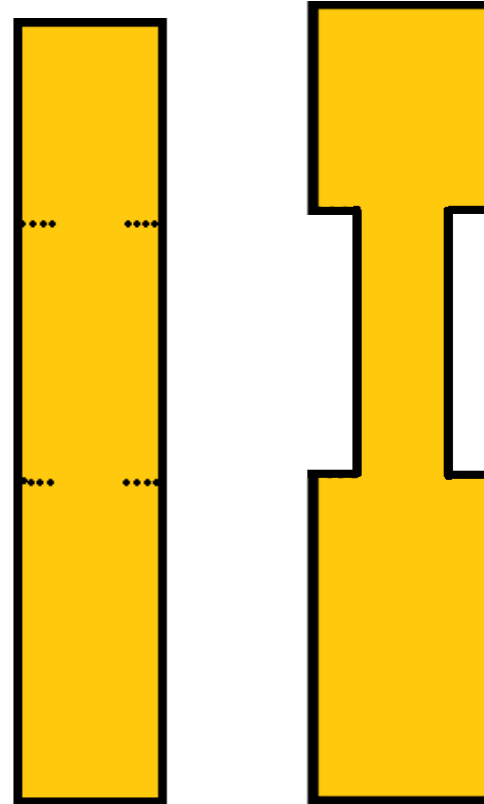
- △ Standardized dressing and fixation strategy



# NGT's

## Securement

△ Prep skin



Intended to last 3 days

### △ Purpose:

- △ Tx of ileus/bowel obstruction
- △ Adm of medication
- △ Adm of enteral nutrition
- △ Stomach lavage

△ EBR: not needed prophylactically for decompression in post op setting

△ Chest x-ray confirmation on initial placement

- △ Gastric content return
- △ Capnography

### △ Complications:

- △ Incorrect placement
- △ Pressure injuries-4.8%-8.1%

# Urinary Catheters



## Indications

- △ Perioperative use for selected surgical procedures
- △ **Urine output in critically ill patients**
  - Only when fluid status or urine CANNOT be assessed by other means
- △ Management of acute urinary retention and urinary obstruction
- △ Assistance in pressure ulcer healing for incontinent patients
- △ Comfort during end-of-life care

## Core Recommendations

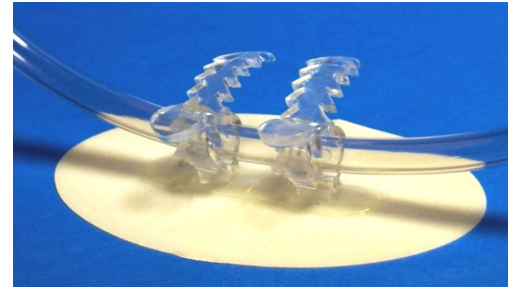
- △ Insert catheters only for appropriate indications (1B)
- △ Leave catheters in only as long as needed (1B)
- △ Ensure that only properly trained persons insert and maintain catheters (1B)
- △ Insert catheters using aseptic technique and sterile equipment (1C)
- △ Consider use of alternatives (II)
- △ Maintain a close drainage system (1B)
- △ **Secure the system (1B)**
- △ Maintain unobstructed urine flow (1B)
- △ Key the collecting bag below the level of the bladder at all times (1B)



# Securement

## 🔗 The Problem:

- △ Risk of dislodgement
- △ Compromised skin integrity
- △ Patient discomfort
- △ Variation in practice



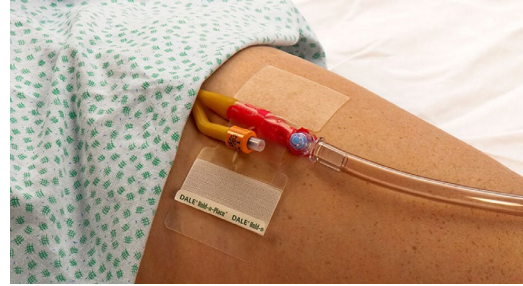
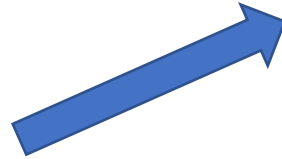
## 🔗 Prevention

- △ Adequate skin prep
- △ Commercially available anchoring device vs. tape
- △ Placed in kits (if possible)

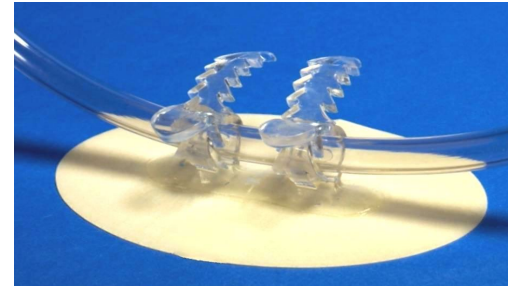


# Types of Securement

 Anchoring



 Locking devices



 Tissue adhesives



 Subcutaneous securement



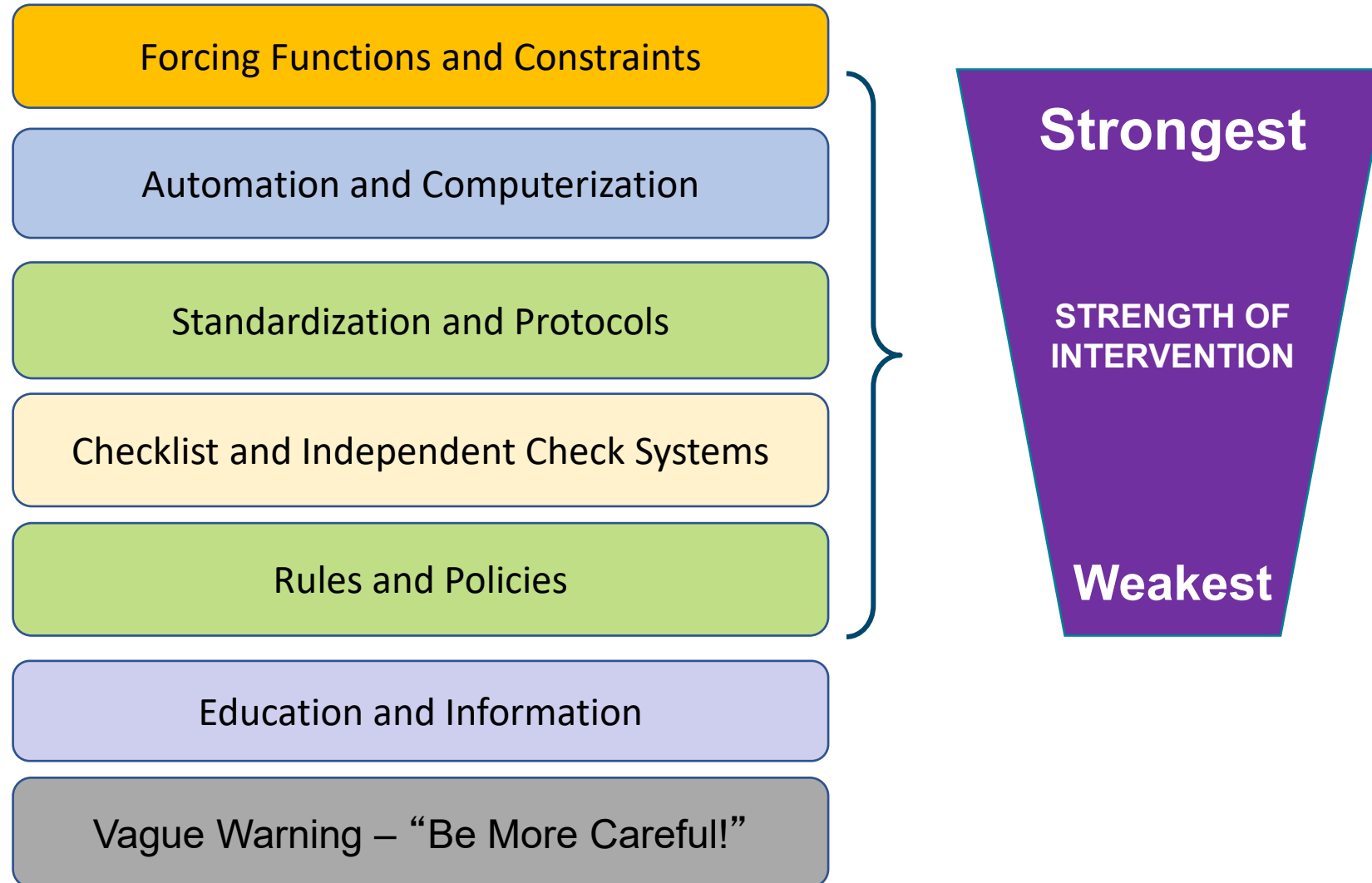
 Sutures



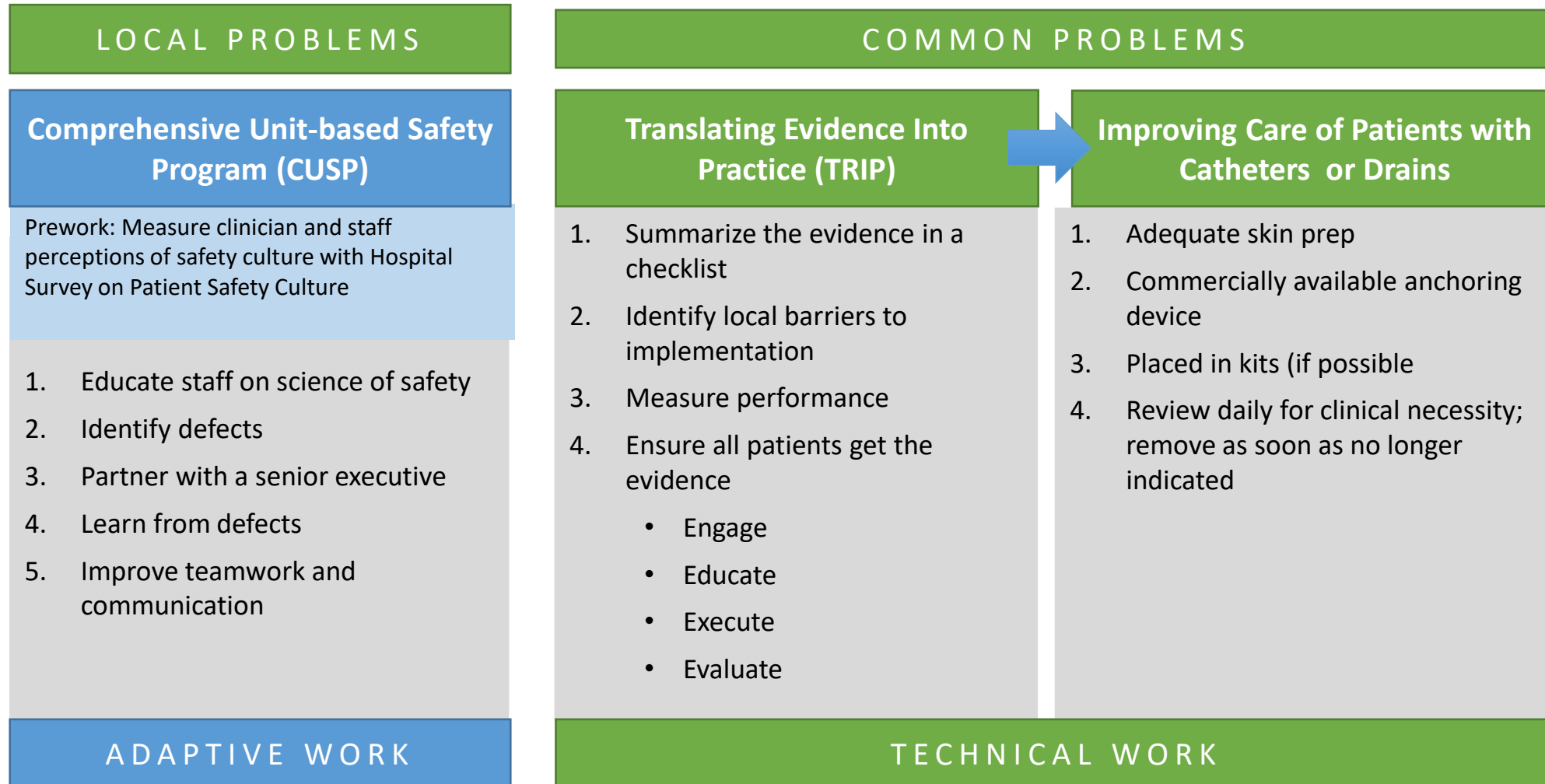


# Evaluating Practice to Reduce Harm

# Building Resiliency into Interventions

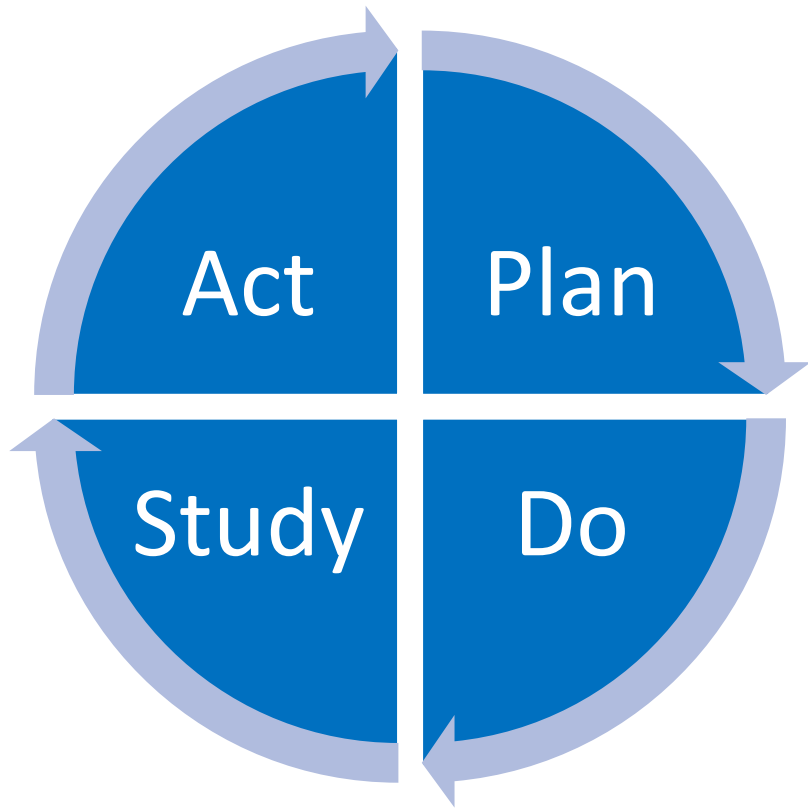


# Model for Improving Care<sup>1-4</sup>





# Why Bother Testing a Change?



What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

**Rapid Cycle Test of Change**



# Principles for Tests of Change

- ▶ Test to evaluate if a new idea or innovation will work
- ▶ Test small (low hanging fruit or quick wins), and usually less than 4 weeks in duration
- ▶ Engage those interested in testing
- ▶ Identify what the question you're trying to answer is
  - △ Identify what data you need to answer the question
- ▶ Collect data over specified time period for pre-post comparison
- ▶ Make informed changes based on data analysis
- ▶ Test under a wide range of conditions

## PDSA: Planning small test of change

In order to accomplish your AIM, what ideas are you going to test in your organization?

Small tests of change	<u>What</u> do you need to test this idea?	<u>Who</u> will be involved in the tests?	<u>How</u> will you educate/inform the participants?	<u>Where</u> will the test occur?	<u>When</u> will the test occur?	<u>How</u> will you know it is successful?

When will you compare what happened to what you predicted? When will you decide what to do next?

Small test of change	What did you predict will happen?	What happened?	What are the next steps?

**PLAN:** What will happen if we try something different?

**DO:** Let's try it! Describe what actually happened when you ran the test.

**STUDY:** Did it work? Describe the measured results and how they compared to your predictions

**ACT:** What's next? Describe what changes to the plan will be made for the next cycle.



A person with a backpack is silhouetted against a vast, snow-capped mountain range under a clear blue sky. The person is standing on a rocky outcrop, looking towards the mountains. The mountains are rugged and covered in snow, with some peaks catching the light. The overall scene is one of a high-altitude, mountainous landscape.

# WHEN WOULD NOW BE A GOOD TIME TO DO THIS?

It is not enough to do your best;  
you must know what to do, and  
**THEN** do your best.

~ *W. Edwards Deming*



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