

# Implementing Change to Prevent CAUTI

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*IAN*  
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“Nothing is more difficult to plan nor more perilous to conduct than the introduction of change. The innovator has for enemies all those who have prospered under the old, and only lukewarm defenders in those who may prosper under the new.... When his enemies have the opportunity to attack they do so with the zeal of partisans, while supporters defend him feebly, endangering both the innovator and the cause.”

– Niccolo Machiavelli. *The Prince*, 1513 AD

Consistently Using Evidence-Based  
Practices Remains a Challenge...

# Hand Hygiene Compliance in Healthcare Workers

(Erasmus et al. Infect Control Hosp Epidemiol March 2010)

- Systematic review of 96 studies
- Overall median compliance of 40%
- Lower rates in physicians (32%) than nurses (48%)
- Lower rates “before” (21%) patient contact rather than “after” (47%)

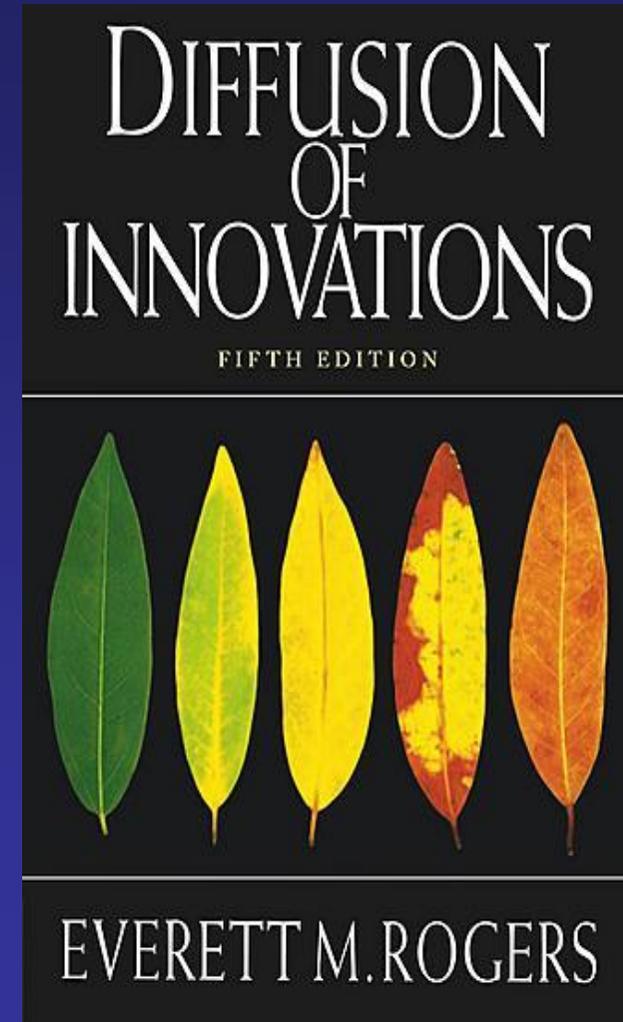
# Given this Gap Between What *Should* Be Done and What *Is* Done...

- Focus on “implementation science”
- “The scientific study of methods to promote the systematic uptake of research findings into routine practice”

(Eccles & Mittman. Implementation Science. Feb 2006)

# “Diffusion of Innovation” Model of Everett Rogers, PhD

- Rogers’ “Diffusion of Innovation” model helps explain why innovations diffuse slowly
- Definitions:
  - Diffusion = spread
  - Innovation = a new practice
- Originally developed for the study of agriculture



# One Possible Systematic Approach

(Skolarus, Ted A., and Anne E. Sales. "Implementation Issues." *Complex Interventions in Health: An Overview of Research Methods* (2015): 265.)

Step 1: Assess practice gaps using current knowledge and current practice

Step 2: Using current knowledge, assess for evidence-based innovations to reduce the practice gap

Step 3: Assess barriers and/or facilitators related to implementing the evidence based innovation

Step 4: Link barriers to evidence-based change techniques

Step 5: Design implementation intervention to overcome barriers

Re-evaluate and go through steps again if necessary



One more approach to consider...

- 1) Includes several elements of other models
- 2) Uses an easy-to-remember mnemonic
- 3) Developed for an infection prevention project

# Keystone Project: Reducing Bloodstream Infections in Michigan

(Pronovost et al. N Eng J Med 2006)

- Collaborative before-and-after study in 103 Michigan ICUs
- Hand hygiene, chlorhexidine, maximum barriers, avoiding femoral site, removing unnecessary lines plus CEO buy-in

Mean rate: 7.7 per 1000 catheter-days at baseline



1.3 per 1000 catheter-days 18 months after ( $P < 0.002$ )



1.1 per 1000 catheter-days 36 months after

(Pronovost et al. BMJ 2010)

# 4E's Model of Implementation

(Pronovost et al. BMJ 2008)

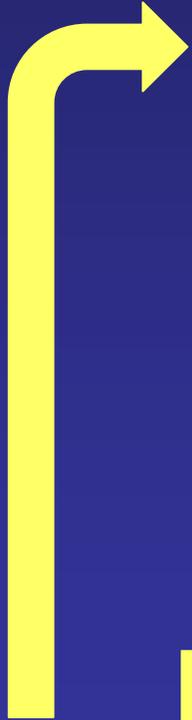
*Needs Assessment: measure baseline performance, identify local barriers, select interventions to implement*

Engage (discuss importance of intervention)

Educate (share specifics of the intervention)

Execute (provide an intervention toolkit)

Evaluate (intended and unintended consequences)



# Outline

- Implementation Science
- Preventing CAUTI
- The Ingredients of Success
- Conclusions



*Implementation*



*Technical*



*Socio-  
adaptive*

# Healthcare-Associated Infections: Common, Costly, & Harmful

**~5-10%**

of hospitalized patients develop a healthcare-associated infection

- ~50% of infections could be prevented
- Preventive practices used inconsistently

# Catheter-Associated Urinary Tract Infection (CAUTI)

- One of the most common infections
- 1/4 of inpatients receive catheters
- 1/3 of catheter days unnecessary
- 1/3 of physicians unaware their patient has a catheter
- 1/3 of the time no order for a catheter

***The Foley also leads to  
non-infectious harms.***

# Annals of Internal Medicine

ESTABLISHED IN 1927 BY THE AMERICAN COLLEGE OF PHYSICIANS

SEPTEMBER 17, 2013

## Determining the Noninfectious Complications of Indwelling Urethral Catheters

A Systematic Review and Meta-analysis

John M. Hollingsworth, MD, MS; Mary A.M. Rogers, PhD; Sarah L. Krein, PhD, RN; Andrew Hickner, MSI; Latoya Kuhn, MPH; Alex Cheng, MD; Robert Chang, MD; and Sanjay Saint, MD, MPH

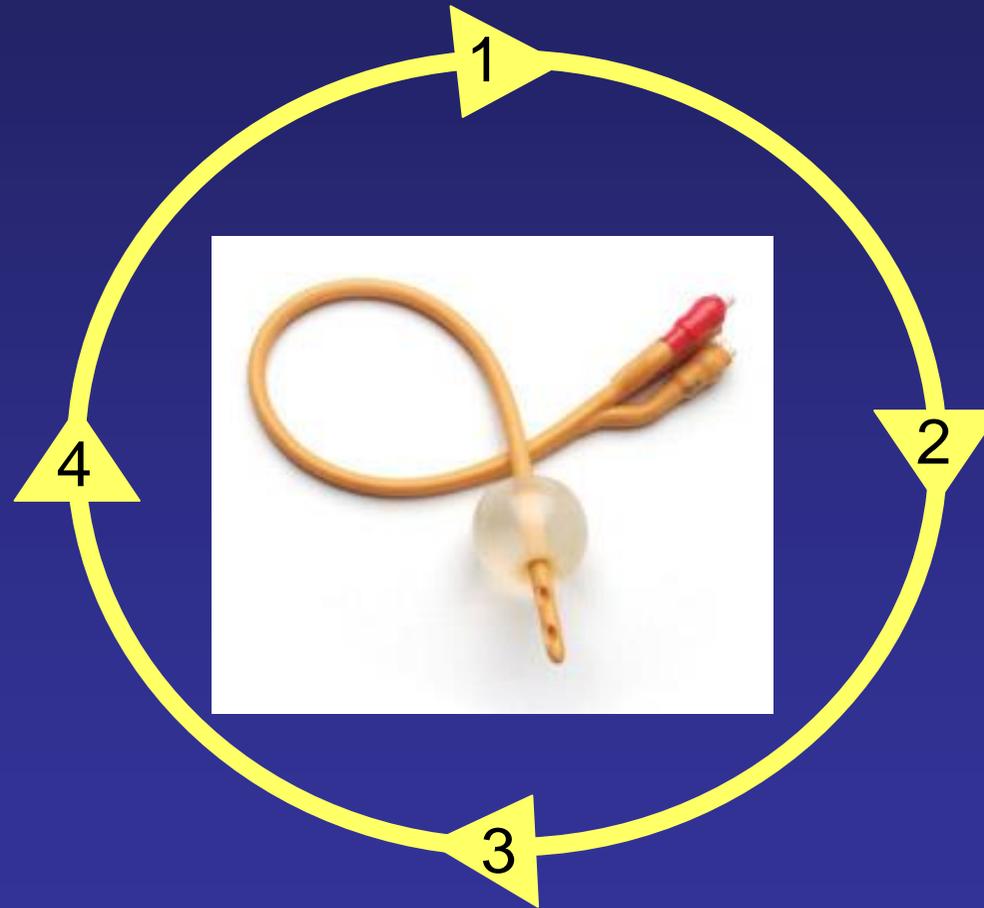
“Many noninfectious catheter-associated complications are at least as common as clinically significant urinary tract infections.”

***How can we reduce catheter use and decrease CAUTI?***

# Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement

4. Preventing Catheter Replacement



2. Maintaining Awareness & Proper Care of Catheters

3. Prompting Catheter Removal

# Preventing CAUTI in Acute Care

(Saint et al. N Engl J Med 2016)

- Federally-funded national program
- Total of 603 hospitals (926 units) in 32 states, DC, & Puerto Rico
- ~60% non-ICU; ~40% ICU
- Non-ICUs: CAUTI reduced by 32% (& decrease in catheter use)
- ICUs: no change in CAUTI or catheter use

*The key intervention was having the bedside nurse assess daily for catheter necessity.*

# Outline

- ✓ Implementation Science
- ✓ Preventing CAUTI
- **The Ingredients of Success**
- Conclusion



# *Implementation*



*Technical*



*Socio-  
adaptive*

*A key ingredient for success  
is taking advantage of  
anchoring heuristic.*

# Taking Advantage of Anchoring Bias

- Infection Prevention: make sure your initial intervention is a success
- Pick the low-hanging fruit first
- Once successful, tackle harder problems



*A 2nd ingredient for success is  
anticipating common people-  
related barriers.*

# Active Resistors





Organizational Constipators

*A 3<sup>rd</sup> ingredient for success is to ensure a culture of excellence, even in just 1 unit.*

# What is a Culture of Excellence?

- Hospital wants to be superb
- Employees are rewarded for exemplary work
- Employees describe their hospital as “the best” and enjoy working there
- Clear goals that can be achieved

Despite control efforts, the burden of health care associated infections in Europe is high and leads to around 37000 deaths each year. We did a systematic review to identify crucial elements for the organisation of effective infection-prevention programmes in hospitals and key components for implementation of monitoring. 92 studies published from 1996 to 2012 were assessed and ten key components identified: organisation of infection control at the hospital level; bed occupancy, staffing, workload, and employment of pool or agency nurses; availability of and ease of access to materials and equipment and optimum ergonomics; appropriate use of guidelines; education and training; auditing; surveillance and feedback; multimodal and multidisciplinary prevention programmes that include behavioural change; engagement of champions and positive organisational culture. These components comprise manageable and widely applicable ways to reduce health care associated infections and improve patients' safety.

(Zingg et al. Lancet Infect Dis 2015)

# Culture of Mediocrity

- Happy to be “average”
- Constipators are prevalent
- Leadership is considered ineffective
- Over-performers are rewarded by ....
- Underperformers are not held accountable

*A 4<sup>th</sup> ingredient for success is figuring out how to engage the clinicians in the hospital.*



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Contents lists available at [ScienceDirect](#)

## American Journal of Infection Control

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)

AJIC  
American Journal of  
Infection Control

Original article

### Engaging health care workers to prevent catheter-associated urinary tract infection and avert patient harm



Mohamad G. Fakh MD, MPH<sup>a,b,\*</sup>, Sarah L. Krein PhD, RN<sup>c,d</sup>,  
Barbara Edson RN, MBA, MHA<sup>e</sup>, Sam R. Watson MSA, MT<sup>f</sup>, James B. Battles PhD<sup>g</sup>,  
Sanjay Saint MD, MPH<sup>c</sup>

# Physicians...

- Play a significant role in shaping care in the hospital
- Tend to be fairly autonomous; may not be employed by the hospital
- Primarily interested in treating illness – typically not trained to focus on improving safety and preventing harm
- Likely unaware of safety efforts in the hospital; most have limited time to volunteer for supporting the safety agenda
- Change may not be readily embraced

# How to Engage Physicians?

(James Reinertsen, IHI innovation Series White Paper, 2007)

1. Develop a common purpose (patient safety, efficiency)
2. View physicians as partners (not barriers)
3. Identify physician champions early
4. Standardize evidence-based processes
5. Provide support from leadership for the efforts of the physician champion

# Overcoming Resistance: Finding a Member of the Tribe

- A chief of staff (and a surgeon): “...surgeons are very tribal so what you need to do if you have something that you think is a best practice at your hospital...you need to get...either the chair of surgery or some reasonable surgeon...If you come in and you’re an internist ...into a group of surgeons ...the first thing we’re going to do is we’re going to say, ‘Look, you’re not one of us’...the way to get buy-in from surgeons is you got to have a surgeon on your team.”

(Saint et al. Joint Comm Journal Qual Safety 2009)

# CAUTI Physician Champion: Reasons for Them to Support the Champion (or Become One...)

Infectious Disease Specialists	Urologists
<ul style="list-style-type: none"><li>• Reduce CAUTI</li><li>• Reduce antibiotic use</li><li>• Reduce potential of increased resistance and <i>Clostridium difficile</i> disease</li></ul>	<ul style="list-style-type: none"><li>• Reduce trauma (mechanical complications):<ol style="list-style-type: none"><li>1. Meatal and urethral injury</li><li>2. Hematuria</li></ol></li></ul>
Hospitalists	Geriatricians
<ul style="list-style-type: none"><li>• Infectious and mechanical complications</li><li>• Potential catheter complications prolonging length of stay</li><li>• Often salaried physicians with incentives based on hospital-based quality and efficiency</li></ul>	<ul style="list-style-type: none"><li>• Many elderly are frail</li><li>• Urinary catheters are placed more commonly in elderly inappropriately</li><li>• Urinary catheters increase immobility and deconditioning</li></ul>

# CAUTI Physician Champion: Reasons for Them to Support the Champion (or Become One...)

Rehabilitation Specialists	Surgeons
<ul style="list-style-type: none"><li>• The urinary catheter reduces mobility in patients: “one-point restraint”</li><li>• Rapid recovery (improvement in ambulation) may be hampered by the catheter</li></ul>	<ul style="list-style-type: none"><li>• Surgical Care Improvement Project: Remove catheters by postop day 1 or 2</li><li>• Inappropriate urinary catheter use may negatively affect the surgeon’s profile</li><li>• Risk of infection and trauma related to the catheter</li></ul>
Intensivists	Emergency Medicine physicians
<ul style="list-style-type: none"><li>• Intensivists can support the evaluation of catheter need before transfer out of the ICU</li></ul>	<ul style="list-style-type: none"><li>• Up to half of the patients are admitted through the emergency department (ED)</li><li>• Inappropriate urinary catheter placement is common in the ED</li><li>• Promoting appropriate placement of urinary catheters in the ED will reduce inappropriate use hospital-wide</li></ul>

# How to Engage Nurses?

1. Develop a common purpose (patient safety)
2. View nurses as partners (not barriers)
3. Identify nurse champions early
4. Standardize evidence-based processes (and make the right thing to do, the easy thing to do)
5. Provide support from leadership for the efforts of the nurse champion

# Removing Urinary Catheters

- Nursing workload can be an issue
- A Nurse: “...convenience unfortunately is a high priority ...especially with urinary catheters...the workload will be increased if you have to take [patients] to the bathroom or you have to change their bed a little more often ....”

(Saint et al. Infect Cont Hosp Epid 2008)

# Overcoming Barriers

- Nurse buy-in is key to success
- A physician administrator: “Because the nurses on the geriatrics unit wanted to have their patients regain mobility...they viewed mobility as very important ...versus the other units where the nurses didn’t necessarily feel that was a real goal..”
- A nurse champion is critically important!

# Identifying the “Champion”

Successful champions tend to be intrinsically motivated and enthusiastic about the practices they promote:

“I have a certain stature in this hospital...People know that I’m very passionate about patient care so...I get positive reinforcement from them...they’re happy to see me...because ...they know that I’m thinking about what’s best for the patient...”

***Time for a couple of cases...***

# Case#1

- A hospital has initiated a protocol in which nurses assess for catheter presence and appropriateness every day on floor patients using agreed-upon criteria.
- A post-op patient (hip replacement) has a urinary catheter 3 days after surgery. The nurse believes that this does not meet appropriateness criteria and asks the patient's surgeon if she can remove the urinary catheter.

# Case#1, continued

- The orthopedic surgeon states: “Once you go to medical school, you can tell me how to care for my patients.”
- The surgeon is quite prominent and has threatened, in the past when confronted, that he will take his patients to a rival hospital.
- What do you suggest?

# CASE DISCUSSION

# Case#2

- A hospital has a higher SIR than they would like and passes a policy at the Clinical Executive Committee that all unnecessary catheters should be removed as soon as possible using a nurse-initiative removal protocol.
- The physicians are completely behind this policy and are extremely supportive.

## Case#2, continued

- The unit manager and floor nurses on 1 of the 8 units are fully supportive; the nurses on the other 7 are not. Foley use is greatly reduced in this 1 unit; the other units have limited improvement.
- Overall, with all units combined, not much improvement in either catheter use or CAUTI rates are seen.
- What do you do?

# CASE DISCUSSION

*A final ingredient for success is considering sustainability at the outset.*

# Sustainability

- Desired benefits are maintained or improved
- The prevention practice loses its separate identity and becomes part of the hospital routine
- Can you hardwire the practice at your hospital?
- We will discuss sustainability in more detail on the March 30, 2017 webinar

Applying these Principles  
to CAUTI Prevention...

Step 1: Form a multidisciplinary  
CAUTI prevention team

# Key Roles and Responsibilities to Prevent CAUTI

<b>Role or Responsibility</b>	<b>Example of Personnel to Consider</b>
Project coordinator	IP, quality manager, nurse manager, nurse educator
Nurse champion (engage nursing personnel)	Bedside nurse, nurse educator, unit manager, charge nurse
Physician champion (engage medical personnel)	ID physician, hospitalist, hospital epidemiologist, urologist, ED doc
Data collection, monitoring, reporting	Infection preventionist, quality manager, utilization manager

(Modified from [www.catheterout.org](http://www.catheterout.org))

# The 6 Steps to Success

- ✓ Form a multidisciplinary CAUTI prevention team
- 2) Develop/modify a CAUTI policy for your institution
- 3) Pick an appropriate unit to start or go hospital-wide
- 4) Track performance and then escalate as necessary
- 5) Once successful, spread to other places
- 6) Consider sustainability at the outset; hard-wiring is worth the effort

# Prior Use of Tiered Approach

American Journal of Infection Control 43 (2015) 254-9



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Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)



Major article

Introducing the No Preventable Harms campaign: Creating the safest health care system in the world, starting with catheter-associated urinary tract infection prevention



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Kelley Sermak MSHSA, RN<sup>d</sup>, Elissa Gaies MD, MPH<sup>a</sup>, Molly Harrod PhD<sup>a,b</sup>,  
Penny Holland MSN, RN<sup>e</sup>, Suzanne F. Bradley MD<sup>a,c</sup>, J. Brian Hancock MD<sup>f</sup>,  
Sarah L. Krein PhD, RN<sup>a,b,c</sup>

*In 7 VA hospitals CAUTI rate decreased by 66% in non-ICUs: 2.4 to 0.8 post-intervention*

# Urine Culture Stewardship in Patients with Catheters

(Modified from Mohamad Fakhri's "Improving the Culture of Culturing")

## Do Not Routinely Order Cultures

For smelly or cloudy urine (not reliable markers of UTI)

For screening in those admitted to the hospital or undergoing non-urological surgery

Standing orders for UA or culture without an appropriate indication

"PAN-culturing" when change in status (confusion, hypotension, fever, leukocytosis)

To document that a UTI is cleared

## Appropriate to Order Cultures

When a patient appears to be septic without an obvious source

Clinical manifestations indicative of UTI (flank pain, pelvic discomfort, or "FUND" after catheter removal)

Prior to urological surgeries in which mucosal bleeding anticipated or TURP

Early in pregnancy (but best to avoid urethral catheters in these patients)

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# CAUTI Guide to Patient Safety (GPS) ([www.catheterout.org](http://www.catheterout.org))

- Brief, trouble-shooting validated guide available on-line  
(Saint et al. AJIC 2014; Fletcher et al. AJIC 2016)
- 10 questions:
  - *Do you have a well-functioning team?*
  - *Do you have a project manager with dedicated time?*
  - *Do you have an effective nurse champion?*
- Help identify the key reasons why hospitals may not be successful in preventing an infection
- Once barriers identified, can help identify possible solutions

# Outline

- ✓ Implementation Science
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# Conclusions

- Implementing change is difficult
- CAUTI is a prototypical patient safety problem: preventing infection is both simple and complex
- Distinguishing technical from socio-adaptive approaches can be helpful
- The final frontier is...

*“the awareness that arises by paying attention on purpose, in the present moment...”*



(Gilmartin. BMJ 2016)

# Applying Mindfulness to Prevent CAUTI

(Kiyoshi-Teo et al. Infect Cont Hosp Epid 2013)

A 2-second “pause” before inserting a Foley...

*Is the Foley truly needed?*

*Am I using proper technique?*

*Do I need to ask for help?*

Most importantly,

Preventing Infection  
is a Team Sport!