Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Saint S, Greene T, Krein SL, et al. A program to prevent catheter-associated urinary tract infection in acute care. N Engl J Med 2016;374:2111-9. DOI: 10.1056/NEJMoa1504906

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

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I. Supplementary Tables

Table S1. Overview of On the CUSP: Stop CAUTI Educational Activities

Educational Activity	Details	When Provided
Onboarding Calls	Two orientation webinars, one for the State Leads, and a separate one for the hospital units, along with six joint onboarding webinars, covering topics such as team building, data collection, and an introduction to CUSP.	Months 1-3
Learning Sessions	Three in-person or virtual meetings for participating unit teams organized by the State Lead. Included both in person and web-based presentations from national faculty focused on technical aspects of CAUTI prevention, CUSP implementation, data expectations and trends, and guidance on program participation.	Learning Session 1: Months 0-1 Learning Session 2: Months 8-9 Learning Session 3: Months 17-18
Monthly National Content Calls	Phone calls or webinars, led each month by national faculty focusing on either technical aspects of CAUTI prevention or CUSP safety culture topics.	Months 4-18; rotating between CAUTI and CUSP topics every other month
Monthly Coaching Calls	Phone calls with the State Leads and all participating units in that State. Supported by national program faculty from MHA and extended faculty from APIC, SHEA, ENA, and SHM, to address CUSP and CAUTI questions.	Months 3-6 led by MHA staff Months 7-18 led by State Lead.
Independent Self-Study	Materials were available on the program website on both CUSP and CAUTI topics, including a detailed implementation guide and recorded versions of previous presentations. These materials are now available on the AHRQ website (www.ahrq.gov/cautitools)	Months 1-18

CUSP = comprehensive unit-based safety program. CAUTI = catheter-associated urinary tract infection. MHA = Michigan Health & Hospital Association. APIC = Association for Professionals in Infection Control and Epidemiology. SHEA = Society for Healthcare Epidemiology of America. ENA = Emergency Nurses Association. SHM = Society of Hospital Medicine. AHRQ = Agency for Healthcare Research and Quality.

Table S2. Catheter Utilization and CAUTI Rates by Unit Type and Study Period

	Study Period	Hospital Units (no.)	Catheter-days	Patient-days	Catheter Utilization	CAUTI (no.)	NHSN CAUTI Rate*	Units with Zero CAUTI
Non-ICU	Baseline1	532	61853	299816	20.6%	155	2.51	77.4%
	Baseline2	535	59067	291698	20.2%	170	2.88	79.4%
	Baseline3	535	57911	292868	19.8%	158	2.73	77.9%
	Implementation1	519	57252	286199	20.0%	130	2.27	81.3%
	Implementation2	504	54007	273881	19.7%	122	2.26	81.5%
	Sustainability1	488	53843	265345	20.3%	106	1.97	83.4%
	Sustainability2	467	47859	254152	18.8%	107	2.24	82.4%
	Sustainability3	428	40306	218792	18.4%	71	1.76	86.9%
	Sustainability4	362	35058	192393	18.2%	68	1.94	85.1%
ICU	Baseline1	360	69177	115701	59.8%	166	2.40	73.1%
	Baseline2	366	67123	110442	60.8%	170	2.53	70.8%
	Baseline3	364	65274	106846	61.1%	189	2.90	72.8%
	Implementation1	361	64920	104447	62.2%	149	2.30	74.0%
	Implementation2	351	65418	106662	61.3%	177	2.71	69.2%
	Sustainability1	342	64832	102011	63.6%	185	2.85	67.8%
	Sustainability2	321	59311	92772	63.9%	184	3.10	68.8%
	Sustainability3	295	52957	84448	62.7%	127	2.40	71.5%
	Sustainability4	264	46127	80032	57.6%	110	2.38	75.0%

CAUTI = catheter-associated urinary tract infection. ICU = intensive care unit. NHSN = Centers for Disease Control and Prevention's National Healthcare Safety Network.

* NHSN CAUTI rate = number of CAUTI per 1,000 indwelling urinary catheter-days.

Table S3: Comparison of hospital characteristics between all units included in the analysis and all units excluded from the analysis

	All Units		
Characteristic	**Included Units (n=926)**	**Excluded Units (n=208)**	**P-value**
Hospital Bed size†	239 ± 224	200 ± 199	0.02
ICU	40.3%	34.1%	0.10
Teaching Hospital	10.5%	5.3%	0.02
Rural Hospital	31.4%	38.9%	0.04
Critical Access Hospital	13.0%	14.4%	0.57

ICU = intensive care unit.
† Hospital bed size results reported as mean ± standard deviation. All other results reported as percentages.

Table S4: Comparison of hospital characteristics between units included in the analysis and units excluded from the analysis by unit type

	ICUs			Non-ICUs		
Characteristic	**Included Units (n=373)**	**Excluded Units (n=71)**	**P-value**	**Included Units (n=553)**	**Excluded Units (n=137)**	**P-value**
Hospital Bed size†	297 ± 247	268 ± 246	0.36	200 ± 198	165 ± 138	0.06
Teaching Hospital	18.2%	5.6%	0.01	5.2%	5.1%	0.95
Rural Hospital	25.7%	36.6%	0.06	35.3%	40.1%	0.29
Critical Access Hospital	2.9%	8.5%	0.03	19.7%	17.5%	0.56

ICU = intensive care unit.
† Hospital bed size results reported as mean ± standard deviation. All other results reported as percentages.

Table S5: Comparison of participating units with complete data submission to those with incomplete data submission

Characteristic	Complete Data (n=573)	Incomplete Data (n=353)	P-value
Hospital Bed size†	271 ± 248	188 ± 166	<0.001
ICU	43.3%	35.1%	0.01
Teaching Hospital	12.7%	6.5%	0.004
Rural Hospital	29.3%	34.8%	0.08
Critical Access Hospital	10.3%	17.3%	0.002

ICU = intensive care unit.
† Hospital bed size results reported as mean ± standard deviation. All other results reported as percentages.

II. Example Tools from On the CUSP: Stop CAUTI program

1) Toolkit for Reducing CAUTI in Hospital Units.

The final versions of selected CAUTI prevention resources that were developed and applied in the national *On the CUSP: Stop CAUTI* project are now available on the Agency for Healthcare Research & Quality (AHRQ) website (http://www.ahrq.gov/cautitools) as the AHRQ Safety Program for Reducing CAUTI in Hospitals "Toolkit for Reducing CAUTI in Hospital Units." This includes an updated final version of the Implementation Guide for use by any hospital that is trying to improve CAUTI prevention.

On the CUSP: Stop CAUTI Implementation Guide

A Practical Resource for Improving Safety in Your Unit

Prepared for:
Agency for Healthcare Research and Quality (AHRQ)

U. S. Department of Health and Human Services (HHS)

Contract Number: 290-06-00022I-8

Contract Title:

National Implementation of the Comprehensive Unit-based Safety Program (CUSP) to Reduce Catheter-associated Urinary Tract Infection (CAUTI)

Contractor:

Health Research & Educational Trust, Chicago, IL

Prepared by:

Health Research & Educational Trust

Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality

Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality

Ann Arbor VA Medical Center and the University of Michigan Patient Safety Enhancement Program

St. John Hospital and Medical Center

Updates:

November 2012 – Updated Section III narrative on insertion, appendices added.

October 2013 – Resources and guidelines for ED Improvement Intervention participants added.

February 2014 – Resources and guidelines for ED Improvement Intervention updated.

December 2015 – February 2014 version updated with publically available web links after the project website was removed in August 2015. This version of the guide was intended only for use by units participating in the collaborative.

NOTE: In September 2015 a revised final version of this guide was prepared for hospital units to use after the On the CUSP: Stop CAUTI program ended and is available as **AHRQ Pub No. 15-0073-2-EF (http://www.ahrq.gov/professionals/quality-patient-safety/hais/cauti-tools/impl-guide/index.html)**

Table of Contents

I. Project Overview

The Purpose of This Manual

This manual will help your team implement *On the CUSP: Stop CAUTI* in your patient care units that have committed to reducing catheter-associated urinary tract infections (CAUTI) and improving safety culture. This manual describes the collaborative model, presents teamwork and project management tools, delineates roles and responsibilities of unit-level project leaders, and defines measures of success for the program. To assist states and unit teams with the implementation of this project, this manual provides brief overviews of the concepts and processes to be applied as well as more detailed recommendations on how to implement the *On the CUSP: Stop CAUTI* project.

This manual is intended to serve as a resource for your team in implementing *On the CUSP: Stop CAUTI*. It is supplemented by templates, tools, and educational conference calls and webinars, many of which are available in the appendices as well as on the national project web site. [Note: The project web site was removed in August 2015, but publically available project materials can be found at http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html.] Additionally, state-level support is available for unit teams from State Hospital Associations (SHAs).

Although this manual provides step-by-step guidance on completing project implementation activities, it is important to acknowledge that these are guidelines to which you should apply your own local experience and expertise.

Problem

Health care-associated infections (HAIs) are one of the most common complications of hospital care. Nearly two million patients develop HAIs annually, which contribute to approximately 99,000 deaths and $28 billion to $33 billion in health care costs.[1] Given the importance of HAIs in reducing costs and improving patient safety, Health and Human Services Secretary Kathleen Sebelius, joined by leaders of major hospitals, employers, health plans, physicians, nurses, and patient advocates, on April 12, 2011 announced the launch of the Partnership for Patients initiative. This new national partnership is intended to save 60,000 lives by stopping millions of preventable injuries and complications in patient care over the next three years. Reducing CAUTI is part of the national HAI initiative, which aims to save up to $35 billion in health care costs, including up to $10 billion for Medicare. CAUTIs are the most common type of HAI in U.S. hospitals and account for 35 percent of all such infections.[2] The estimated total U.S. cost per year for CAUTI is $565 million, and the estimated number of deaths per year is 8,205.[1]

Six hundred thousand patients develop hospital-acquired UTIs each year, and CAUTIs comprise around 75 percent of these cases.[3, 4] Research suggests CAUTIs are preventable and that perhaps as many as 50 to 70 percent of these episodes are preventable.[5, 6]

Patients with indwelling urinary catheters are at greater risk for developing UTIs with risk of bacteriuria increasing with each day of use:

- Per day: ~5 percent
- 1 week: ~25 percent
- 1 month: ~100 percent

The leading risk factors of CAUTI include prolonged catheterization, female gender, and catheter insertion outside of the operating room.[7]

About 15 to 25 percent of patients will have a urinary catheter placed during their hospitalization. Many of these catheters are placed either in the intensive care unit, emergency department, or the operating room. Up to 50 percent of patients from non-intensive medical and surgical units may not have a valid indication for urinary catheter placement thus contributing to the high rate of CAUTI.[7] Approximately one-third of physicians in a 2000 study by Saint et al. were not aware that their patients even had an indwelling urinary catheter.[2]

Due to the magnitude of this problem and because these infections are often preventable, the Centers for Medicare & Medicaid Services (CMS) has included CAUTI on their list of hospital-acquired conditions for which it will no longer reimburse. In a 2007 study, cases with CAUTI resulted in $1,300 to $1,600 in additional cost per patient.[8]

In addition to cost and risk of infection, an even more immediately compelling reason to reduce the use of indwelling catheters is patient discomfort.[9] A report of Veteran's Health Administration patients found that nearly 50 percent of patients found indwelling catheters to be uncomfortable and painful. In addition, indwelling urinary catheters restrict patients' ability to ambulate.[10]

Goals

Recently, there have been demonstrations of a successful approach to reducing the use of indwelling urinary catheters.[11] The Michigan *Keystone: Hospital-Associated Infection* project is a statewide initiative that began in 2007 that is reducing the use of urinary catheters. Over the course of the first two years, the participating units successfully achieved and sustained a reduction of approximately 25 percent in the use of urinary catheters.[12] Based on these efforts and the success in Michigan, the Agency for Healthcare Research and Quality (AHRQ) has funded the Health Research & Educational Trust, the Michigan Health & Hospital Association (MHA) Keystone Center for Patient Safety & Quality, St. John Hospital and Medical Center, the University of Michigan's Patient Safety Enhancement Program, and the Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality (Armstrong Institute) to lead the *On the CUSP: Stop CAUTI* project to reduce catheter-associated urinary tract infections (CAUTI) and to improve unit safety culture. This national project focuses on clinical interventions for indwelling catheters with regard to appropriate insertion and appropriate care and removal. In addition to the clinical interventions, the project focuses on improving unit safety culture using the Comprehensive Unit-based Safety Program (CUSP) developed by the Armstrong Institute.

The national goals of *On the CUSP: Stop CAUTI* are twofold:

1. Reduce mean CAUTI rates in participating clinical units by 25 percent
2. Improve safety culture, as evidenced by improved teamwork and communication, by disseminating the CUSP methodology

The unit-level objectives of the project include:

1. Promote the appropriate use of indwelling catheters
2. Improve the culture of safety, teamwork, and communication
3. Improve proper placement technique and care of the catheter

Solution

To achieve CAUTI reduction, improve unit safety culture, and sustain these improvements, a strategy to address both technical and adaptive problems is necessary. A technical problem is a problem that is readily identified with known solutions. CAUTI and its prevention interventions are the technical component. An adaptive problem is less easily identified, and the solutions are not always apparent. A focus on adaptive components addresses the unit team's values, attitudes, and beliefs, qualities often collectively referred to as *culture*. Addressing either technical or adaptive challenges—but not both—may not result in the success you are trying to achieve.

To meet the goals of this national and local initiative, all of the following pieces of the *On the CUSP: Stop CAUTI* project need to be implemented:

- Adaptive and Technical Interventions
- Education and Coaching Support
- Measures of Success
- Project Infrastructure

The combination of these activities and the project infrastructure makes the implementation and spread of this work possible across states, hospitals, and units. Each activity is introduced in this section of the manual.

Adaptive and Technical Interventions

The On the CUSP: Stop CAUTI project includes the following adaptive and technical interventions to reduce CAUTI:

ADAPTIVE

1. 4 E's Model
2. The Comprehensive Unit-based Safety Program (CUSP)

TECHNICAL

3. Appropriate Catheter Use Intervention
4. Proper Catheter Insertion and Maintenance Intervention
5. Prompt Catheter Removal Intervention

Over the course of this project, your team will be provided with the information to implement each of these interventions. A summary of each intervention follows below with greater detail for each intervention provided in sections five and six.

1. The 4 E's Model

The Armstrong Institute developed the 4 E's model to help implement patient safety interventions. This model includes four key elements: Engage, Educate, Execute, and Evaluate.[13]

Step 1: Engage. Unit teams help staff understand the impact of preventable harm caused by CAUTI by sharing stories about patients who develop these infections, and by estimating the number of patients who are harmed given the unit's current infection rates.

Step 2: Educate. Unit teams ensure staff and senior leaders understand what they need to do to prevent infections.

Step 3: Execute. Execution is based on the principles of safe system design: simplify the system, create redundancy, and learn from mistakes.

Step 4: Evaluate. Using standardized NHSN definitions for CAUTI, teams will regularly collect and submit CAUTI rates along with the prevalence and appropriateness of urinary catheter use.

This model will be used in conjunction with the CUSP model to help unit teams create change and improve patient safety in their units.

2. The Comprehensive Unit-based Safety Program (CUSP)

CUSP is a model designed to improve patient safety on a clinical unit by providing a common platform for understanding the science of safety, then integrating key habits and steps into the daily routines of a

unit or clinical area. CUSP draws on the wisdom of frontline providers who have practical knowledge regarding safety risks to their patients and provides a mechanism to help analyze and reduce the risk of those hazards. The CUSP model has five components: science of safety, identifying defects, executive adoption of the unit, learning from defects, and implementing teamwork and communication tools. In addition to these five components, CUSP emphasizes the importance of a diverse team, focuses on the input of direct care providers, discusses the importance of a common goal, identifies issues that the team can successfully solve, and integrates these elements as part of the team's routine work. Similarities to important components and teachings found in CUSP can be found in the literature on other change leadership models listed in the comparison table below.

Table 1: Culture Change Model Comparison Table

Objective	CUSP	Kotter: Leading Change	Kouzes and Posner: Leadership Challenge	As Applied to CAUTI
Developing Engagement	ENGAGE, EDUCATE Science of Safety, the Josie King Story	Create a Sense of Urgency	Encourage the Heart	Describe appropriate indications/processes to improve appropriate care, insertion, and removal when catheter is no longer indicated
Team Development	ENGAGE, Senior Leader Partnership with the CUSP Team	Create a Guiding Coalition	Model the Way	
Developing Alignment	ENGAGE, "What hill do we climb?"	Develop a Shared Vision	Inspire a Shared Vision	
Sharing Approach		Communicate the Vision		
Empowerment	EXECUTE, Direct Care Provider involvement, Teamwork and Communication Tools	Empower Others to Act	Enable Others to Act	Assess for catheter presence and indication. Remove when no longer needed. Do not place catheter unless it is an appropriate indication.
Implementing Change	ENGAGE, EXECUTE, EVALUATE, Learning from Defects	Generate Short Term Wins	Challenge the Process	Improve utilization practices, evaluate improvement in compliance with indications and in symptomatic CAUTI
Spread	ENGAGE, EXECUTE EVALUATE, Learning from Defects	Consolidate Gains and Produce More Change		
Sustainability	Part of the Daily Work	Anchor New Approaches in Culture		

The components of CUSP provide strategies, information, and tools that can be adapted to use elsewhere in your organization.

CUSP is associated with improvements in patient safety, clinical outcomes, and safety culture.[12, 14, 15, 16] In the context of CUSP, culture has been diagnostic of unit strengths and weaknesses, responsive to interventions, and relevant to the unit frontline providers. Moreover, in the work with the Michigan *Keystone: ICU* program, linking culture through CUSP with focused clinical interventions (for example, to reduce central line-associated bloodstream infections (CLABSI) led to sustained reductions in infection rates. [12, 14, 15, 16]

3. Appropriate Catheter Use Intervention

Nursing workload has been cited as a significant issue in reducing infections because urinary catheters can ease nursing workflows, and there may be a perceived incentive for catheter placement. The Appropriate Catheter Use Intervention includes education for staff on appropriate indications and ways to avoid urinary catheter placement.

4. Proper Catheter Insertion and Maintenance Intervention

If appropriate indications for a urinary catheter exist, clinicians can reduce the risk of infection by following evidence-based recommendations for proper catheter insertion and maintenance. Key elements of the Proper Catheter Insertion and Maintenance Intervention include ensuring that only properly trained clinicians have responsibility for catheter insertion and maintenance, use of aseptic technique for insertion, and maintenance of a sterile, continuously closed drainage system.

5. Prompt Catheter Removal Intervention

More than 14 studies have evaluated the effectiveness of urinary catheter reminders and stop-orders, including written, computerized, and nurse-initiated stop-orders in reducing infections. The evidence indicates that reminders and stop-orders result in significant reduction in catheter use and significant reduction in infection, and there is no evidence of harm, such as a need for re-insertion.[11] This Prompt Catheter Removal Intervention implements a process to evaluate urinary catheter utilization and compliance with appropriate indications, and promotes sustained improvements through daily evaluation of catheter appropriateness and prompt removal when a catheter is no longer needed.

St. John Hospital and Medical Center in Michigan used a process to evaluate the need for indwelling urinary catheters and reduced unnecessary urinary catheter use by 45 percent. This work was expanded to participating units from approximately 70 Michigan hospitals enrolled in the *MHA Keystone: Hospital-Associated Infection* prevention project, which has shown and sustained a 25 percent reduction of all catheter use (unpublished data) over a period of 18 months.

Education and Coaching Support

A key component to implementing this work is the efficient and effective dissemination of information to frontline staff and providers charged with changing processes to improve patient safety, care delivery, teamwork, and culture. The *On the CUSP: Stop CAUTI* project delivers educational content in a variety of formats, including conference call series, manuals and toolkits, and an in-person meeting. The project begins with an initiation call that prepares teams to participate in the project. Next are a series of content calls that discuss in further detail several components of the intervention. Call-in informational sessions on data collection and submission occur prior to the collection of baseline data. All calls include a question and answer component for interaction with the speakers. During the intervention period of the project, teams will participate in coaching calls. Coaching calls are completely interactive and structured according to the teams' needs.

Throughout the project, coaching and support are offered to the units at both a national and state level. The State Lead is available on coaching calls and serves as the key contact and call facilitator. State Leads are also available to answer ad hoc questions units may have regarding the project. The National Project Team (NPT) provides periodic support.

Additional resources are provided by the NPT and State Leads to help teams implement the intervention. Below is an abridged list of educational resources available to *On the CUSP: Stop CAUTI* teams via the project web site.

Table 2: Selected Resources Available on Project Website

Resource Title	Resource Description
Onboarding Call Series	These 60 to 75-minute calls provide information regarding each main element of the program. Below is an example, and all call slides and recordings are available online.
Onboarding Call #1: Building a Team and a Process to Reduce CAUTI Risk	This 75-minute call discusses how to identify key members of an effective CAUTI reduction team. It provides information on appropriate indications for catheter insertion and how to implement a process to evaluate urinary catheter need.
Toolkits and Resources	These guides provide information to help you implement the *On the CUSP: Stop CAUTI* intervention in your unit. Below is an example, but all toolkits and project implementation resources are available online.
Cohort Data Collection Calendar	This tool itemizes data collection and data entry that must be completed throughout the project life cycle [website with cohort specific calendar removed August 2015 – for an outline of data collection times for all cohorts, see Table 8].

Measures of Success

Complete and meaningful data justify the allocation of resources that are necessary to implement this work and demonstrate improvement over time. In addition, the collection and reporting of data are effective means of providing feedback to the teams and support improvement and sustainability. However, in most quality improvement projects up to 60 percent of data is missing.[17] Missing data significantly damage the capacity to determine whether a given intervention has been successful. Yet, if the data burden of a project is too great, then teams struggle to collect and report it. For this reason, this project has a narrow set of measures that are collected and reported on a schedule that attempts to provide relevant feedback while reducing the data collection burden. The timing of the data collection is closely linked to the timing of interventions allowing for real-time improvement. Three types of measurements will be collected from participating acute care units:

1. Culture Measures
    a. Hospital Survey on Patient Safety Culture (HSOPS) at baseline and again near the end of the project
    b. Readiness Assessment
    c. Team Checkup Tool (TCT)
2. Outcome Measures
    a. CAUTI rates
    b. Catheter prevalence
3. Process Measures
    a. Cather prevalence
    b. Catheter appropriateness

The data definitions and collection processes are explained in more detail in section IV of this manual.

Project Infrastructure

National Project Team

The National Project Team to implement this patient safety improvement effort consists of 10 organizations that each contribute unique knowledge and experience to support the improvement effort and to build program capacity at the national, state, hospital, and hospital unit levels. The following is a brief description of each individual organization's role within this project:

- The Health Research & Educational Trust (HRET) administers the project and provides oversight of the national implementation effort. This includes budget and project management, state recruitment, and support for implementation. HRET assists with coordination of meetings, educational conference calls, and web site maintenance. Beyond the initial project period, HRET is also responsible for helping states sustain and spread their success by disseminating the lessons learned in this national effort.

- The Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality (MHA Keystone) contributes to the development and coordination of the project's education and coaching. MHA Keystone is responsible for data collection and reporting, as well as supporting content and coaching calls. They address clinical interventions, data use, submission, and reporting issues and provide project implementation advice.

- The Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality (Armstrong Institute) reviews the CUSP content adapted by HRET for this project and provides related tools. Armstrong Institute faculty support national CUSP calls and consult with HRET and MHA on emerging content specific to CUSP. The Armstrong Institute also serves as faculty for the initial CUSP educational sessions.

- The University of Michigan is a national leader in CAUTI prevention research. University of Michigan faculty serve on the NPT as CAUTI prevention content experts.

- St. John Hospital and Medical Center demonstrated the effectiveness of the CAUTI prevention techniques used by the *On the CUSP: Stop CAUTI* through their early implementation of CAUTI reduction interventions. A member of the St. John faculty serves on the NPT as a CAUTI prevention content expert.

- The Centers for Disease Control and Prevention (CDC) provide technical assistance to state health departments to assist in the creation of sustainable state infrastructures for HAI prevention as part of a larger HAI Action Plan. CDC definitions are used as the standard in *On the CUSP: Stop CAUTI*.

- The Association for Professionals in Infection Control (APIC) provides guidelines for infection control that are used in *On the CUSP: Stop CAUTI*.

- The Emergency Nurses Association (ENA) provides extended faculty support to help facilitate learning and training of units.

- The Society for Hospital Medicine (SHM) has created a mentoring program to link health workers in hospitals for professional growth and learning. *On the CUSP: Stop CAUTI* will work with this program to help facilitate learning.

- The Society for Healthcare Epidemiology of America (SHEA) provides extended faculty support to help facilitate learning and training of units.

State Collaborative

State hospital associations (SHA) play a key role in the implementation of the *On the CUSP: Stop CAUTI* intervention. SHAs act as liaisons between the NPT and hospitals within their respective states. The State Lead at each SHA serves as a local content advisor and coach to teams.

Depending on your state, your SHA may coordinate with your state health departments, quality improvement organizations, or other quality and patient safety organizations. While the roles of these groups vary among individual states, their partnership aids in the implementation of the program as they

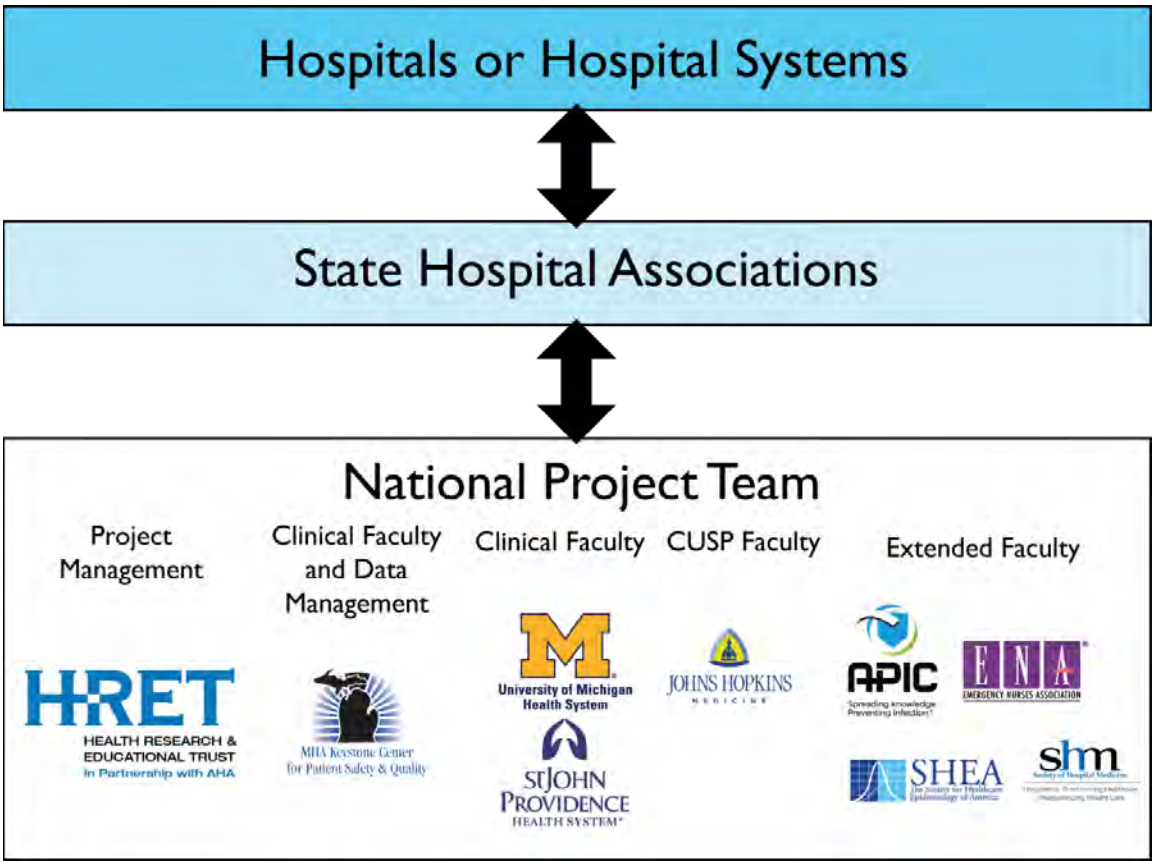
help to recruit hospitals, market the importance and practicality of the program, and maintain program data.

Not all states are able to support more than one or two cohorts of hospital units in the project. At the same time, no hospital that wishes to participate in the program from anywhere in the country will be barred from participating. Under some circumstances, the role of State Lead—often referred to as a project lead—is fulfilled by a representative of a neighboring state hospital association or a Hospital Engagement Network lead.

Hospital Teams

Embodying the front line role, individual hospital unit teams collect program data and implement the CUSP guidelines to ensure a complete implementation of the *On the CUSP: Stop CAUTI* program. Each step equips the frontline providers of all hospital units with the tools, metrics, and framework to tackle the challenge of quality improvement and CAUTI prevention. Through applying the *On the CUSP: Stop CAUTI* tools, metrics, and framework on the front lines, hospital unit teams play an important role in the project's success. Units participating in the project include medical-surgical units, intensive care units, labor and delivery, emergency department, pediatrics, radiology, and any other unit with high UTI rates.

Graphic 1: Project Infrastructure



AHRQ funds this and other HAI initiatives. AHRQ's mission is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. The research sponsored, conducted, and disseminated by AHRQ provides information that helps people make better decisions about health care. For more information about AHRQ, visit www.ahrq.gov.

II. Frameworks for Change and Improvement

The 4 E's Model

The Armstrong Institute developed the 4 E's model to help implement patient safety interventions.[13] This model includes four stages that answer the following questions:

1. **Engage**: How will this make the world a better place?
2. **Educate**: How will we accomplish this?
3. **Execute**: What do we need to do?
4. **Evaluate**: How will we know we made a difference?

Engage: How does this make the world a better place?

The first E focuses on *engagement*. This is the step where you help your entire organization to understand the significance of reducing CAUTI. Project leaders talk to senior leaders, team leaders, and bedside staff about the prevalence of catheter use, the risk to patients, and the health care costs associated with CAUTI. To engage your colleagues, first make the problem real by telling the story of a patient who developed a CAUTI in your clinical area or hospital. Identify a patient in your clinical area who has suffered needless harm from a catheter, and share the patient's story with your colleagues. Work with risk management at your hospital to share this story openly with your colleagues and leadership. Know facts about CAUTI that will engage your unit:

- Millions of urinary catheters are placed each year in the United States, and urinary catheters are frequently used in the hospital setting. However, up to half of urinary catheter device days in the hospital setting may not have a valid indication for use.[18, 19]
- Urinary catheter use has been associated with urinary tract infections and trauma.
- Approximately 600,000 patients develop hospital-acquired urinary tract infections per year. Around seventy-five percent of these episodes are CAUTIs.[1, 2, 3, 4]
- Hospital-acquired bacteriuria or candiduria occurs in 25 percent of those patients who have urinary catheters in place for one week. The risk per day of bacteriuria is about 5 percent, and 3 percent of those with bacteriuria develop a bloodstream infection.[1, 2]
- The longer the urinary catheter is used, the higher risk of infection.
- If the urinary catheter is not present, CAUTI does not occur.
- The cost of a hospital-acquired CAUTI averages between $500 and $1,000. Catheter-related bacteremia increases the cost of care by at least $2,800 per patient.[1, 2]

After sharing the story of a patient who developed CAUTI, post the number of people who developed a CAUTI each month and the total number of CAUTIs for the previous year in your clinical area. To keep staff engaged, post a trend line so that nurses, physicians, and other staff can see at a glance your CAUTI rate and how it changes over time. Use formal and informal opportunities to talk about the intervention

and about unit specific infection rates. Make a point of recognizing providers who follow guidelines for the appropriate use of urinary catheters. Invite your hospital infection control professional or epidemiologist to become an active part of your clinical area's improvement team and draw on his or her expertise to help with your specific challenges. The goal should be that no patient suffers harm from a preventable complication while in your clinical area.

Educate: How will we accomplish this?

The second E, *educate*, is key to accomplishing your goal. Make sure your team understands how they can reduce CAUTI and the use of inappropriate urinary catheters. There are several practices to prevent CAUTI that should be included in any health care worker education. Importantly, clinicians should realize that CAUTI represents more than one-third of all health care-associated infections, and CAUTIs are associated with increased patient morbidity. There are four key approaches to preventing CAUTI. First, insert the indwelling urinary catheter only when needed (based on an appropriate indication). Second, when an indwelling catheter is indicated, ensure that proper insertion technique is used during catheter placement. Third, ensure proper care and maintenance of the urinary catheter system once it is in place. Fourth, promptly remove the catheter when it is no longer needed.

The general steps for education in the project are:

1. Educate staff on the CUSP model beginning with the *Science of Safety* video.
2. Educate staff about the appropriate indications using definitions by the Healthcare Infection Control Practices Advisory Committee (HICPAC) for use and proper care of urinary catheters. There are examples of presentations and educational materials provided in this manual in section III,Table 6: CAUTI Prevention Policies and Educational Materials.
3. Educate staff who are collecting outcome data on the definition of CAUTI.
4. Participate in national and state conference and coaching calls.
5. Share the number of people infected per month and your quarterly infection rates with the unit, medical staff and the executive sponsor. If your team has low rates, it may be better to share the number of inappropriate catheters.
6. Learn from at least one defect per quarter, preferably one or more a month.

Section V includes detailed guidance for implementing the educational components of this project.

Execute: What do we need to do?

The third E focuses on how you will *execute* the program. Even well-conceived, successful programs can fail if they are poorly implemented. Taking time to carefully plan the execution can help reduce this risk.

Successfully implemented projects share some key characteristics. They are usually well structured, provide adequate support for participants, clearly outline roles and goals that are then clearly explained to stakeholders, and are adaptable to the unique needs of participants. At a unit level, take time to

understand the importance of each step of the *On the CUSP: Stop CAUTI* intervention, and gain support to ensure a successful implementation.

To summarize, the general steps of executing this project are:

- Assemble a team, engage staff, and partner with a senior executive.
- Understand the CAUTI interventions. Listen to the onboarding calls and content calls and read through the materials provided by the NPT.
- Understand Safety Culture and how to apply CUSP to daily routine. Materials are available in this manual and on the *On the CUSP: Stop HAI* web site.
- Understand the issues with inappropriate catheter use and risks.
- Understand measures, and establish processes to ensure data is collected. Participate in data calls, and work with your team to put processes in place.
- Use teamwork tools that are relevant to the unit. Tools are available online and in the appendices of this manual.

If implementation does not go as planned, treat it like any other defect, learn from it, and then improve your execution. Section V includes detailed guidance for executing this project.

Evaluate: How will we know we made a difference?

The fourth E focuses on the *evaluation* process. In this step, you reflect on data that has been collected in order to determine the success and where improvements should be made.

Data are collected on culture, process, and outcome measures. Reports are available in Care Counts so that states and units may have continuous access to their data in order to monitor progress over time. These reports can be generated at the unit level and at a higher aggregate level. These reports should be used to evaluate progress on improving urinary catheter utilization, compliance with indications, and CAUTI reduction by sharing them with the safety team, senior executive partner, and unit staff/providers.

In addition to evaluating progress on CAUTI, your unit team will be asked to complete a "Team Checkup Tool" (TCT) on a quarterly basis. This tool asks about the activities the team has implemented in regard to CUSP and culture change, as well as the barriers the team has faced. The TCT is a mechanism for teams to identify what is impeding progress and an ongoing means to see whether improvements are being made. The information from the TCT for your unit should be summarized and reported to the team and the executive partner every quarter. This will provide a channel for the safety team to report issues to management in a way that allows honesty and openness, which in turn may help the executive provide the team with assistance and solutions.

Table 3: Measure Type: Care Counts Reports Available*

Measure Type	Reports Available
Culture	HSOPS Readiness Assessment Team Checkup Tool
Outcome	Symptomatic CAUTI rates: • Number of symptomatic CAUTIs/number of catheter days x 1,000 • Number of symptomatic CAUTIs/number of patient days x 10,000 Data Collection Status Prevalence Rate (catheter days/patient days)
Process	Percent of Patients with a Catheter (Prevalence Rate: number of patients with catheters/total number of patients x100) Data Submission Status Appropriate/Inappropriate Catheter Indication Rates

*Only acute care units participating in On the CUSP: Stop CAUTI will enter data to Care Counts.

Comprehensive Unit-based Safety Program

Overview of the CUSP Model

The CUSP model is designed to equip frontline unit staff with a framework and tools to improve patient care and make your unit safer. For this project, CUSP will serve as a model that will help your unit staff to understand the risks of CAUTI associated with non-compliance with appropriate use and care of the catheter, and the role and shared responsibility of every unit staff member to help change your unit's work processes to reduce the risk of those infections for patients in your care. Culture is a major focus because it represents a set of shared attitudes, values, goals, practices, and behaviors that make one unit distinct from another unit. The CUSP framework is comprised of five components, each described in more detail in this section.

CUSP Components and Implementation Guidance

Assemble the Team

When you assemble your team, remember that culture is local. The *On the CUSP: Stop CAUTI* team is composed of engaged frontline providers who take ownership of patient safety. You should include providers of different types and levels of experience on your team. Partner with nursing, case management, infection prevention, and physicians. Recruiting the right personnel for a unit-based multidisciplinary team is crucial, because the team will:

Assemble the Team through:

- Understanding the importance of a CUSP team
- Developing a strategy to build a multidisciplinary team
- Identifying characteristic of successful teams and barriers to team performance

- Oversee the process to guide the implementation and management of the program
- Be the driving force for sustaining the program

As you develop your *On the CUSP: Stop CAUTI* team, you should ensure that the team possesses four key characteristics of successful teams. They include:

- An identified team leader
- Diverse opinion leaders or dissenters
- Members with a willingness to help spread the intervention
- A majority of members who provide direct care in the unit

These characteristics will help ensure that you have a successful team. Barriers to performance can occur when you do not have all four key characteristics, when there is miscommunication among team members, or when there are competing priorities for team members. Working to reduce these barriers contributes to team success.

<u>What the team needs to do:</u>

- Recruit a team lead, nurse manager, physician, and executive partner along with any other team members. Having a team leader who is a member of the patient care unit maximizes ownership of the project.

- The team leaders should meet with hospital risk management, quality improvement, and infection prevention departments to ensure that CUSP efforts are integrated into overall hospital quality improvement and patient safety efforts. Staff from these departments are knowledgable about existing data collection efforts and have expertise in areas that will be useful to the *On the CUSP: Stop CAUTI* team.

- List team member names and contact information on the Background Quality Improvement Team Form (Appendix A) and post this list in a visible location for staff reference. Perhaps

entertain the idea of an open invitation to join the team at a staff meeting or through another method of communication that will reach the entire staff that work with patients in your area, including members from pharmacy, nutrition, and occupational or physical therapy.

- Use the 4 E's to ensure team engagement. Team members need to know what is in it for them. Engage them in the process. Educate them about their roles. Work with your team to execute the processes. Then evaluate what you have done.

Engage the Senior Executive

Partnering a senior executive with your unit has two goals: to bridge the gap between senior management and frontline providers, and to allow for a system level perspective. The senior executive's role is one of advocacy. The senior executive should be encouraged to discuss the safety issues identified by the team and frontline care providers and to help remove barriers (e.g., lack of resources, political issues, lack of awareness) to implementing improvement efforts. In addition, the executive's role is also to stimulate further discussions about safety, help prioritize safety concerns, suggest solutions to safety concerns, and help set goals for the unit. Additionally, the executive should hold everyone, including providers and him or herself, accountable for undertaking efforts to reduce risks to patients.

Engage the Senior Executive: This step invites a senior hospital executive to partner with your unit in order to:

- Educate leaders about the clinical issues and safety hazards
- Provide staff with resources to mitigate hazards and assist with removal of barriers
- Improve frontline providers' attitudes about leadership
- Help to hold staff accountable for reducing patient risks and open the lines of communication

The effect that the patient safety team and frontline providers can have on the executive is important. The executive can gain tremendous knowledge by observing and understanding the challenges the units face each day on the frontline. In addition, executives may not be aware that system defects exist in their hospital.[20] These valuable insights often alter the way the executives do their jobs, and they frequently report that their hour on the unit is time they look forward to the most each month.

One of the most effective approaches to bridging the gap between senior management and frontline providers is to conduct executive safety rounds, where the executive mingles with providers on the unit while discussing safety issues. Meeting with providers in a conference room format should be kept to a minimum. Meeting with providers on the unit is vastly preferable to meeting in a conference room, as presence on the unit helps to give senior leaders a greater sense of ownership of the project and a sense of being an integral part of the unit team. Meeting on the patient care unit also allows senior executives to be more visible to frontline staff and imparts a stronger sense of commitment to the project.

What the team needs to do:

- The CUSP team leader or members of the safety team should meet with the senior executive assigned to their unit to share unit-specific information before the executive holds safety rounds. To prepare for this meeting, gather relevant information about the unit for the senior executive. This information packet should include:

    - Background information about the CAUTI project
    - Results from the safety culture baseline assessment if available
    - A list of safety issues that have been identified for that unit, such as those that may have been compiled from the staff safety assessment
    - Pertinent information about the unit that the senior executive may not know, especially information in regard to CAUTIs for that unit, and patient/physician demographics. If your senior executive does not have a clinical background, you may want to suggest that he or she visit the unit before the first staff meeting to get a better feel for the unit and how it works. He or she may also want to consider shadowing a provider to observe where system breakdowns are occurring within the unit. The Shadowing Another Profession activity (Appendix B) will be helpful for this.
    - You may also want to provide your unit executive with a concise dashboard about the status of quality and safety culture on your unit. Some suggested sources of data in addition to the safety culture assessment results include sentinel events, incident reports, and liability claims. In the Michigan experience, a patient safety dashboard was used that included four items: how often patients are harmed (infections), how often they get the right care (appropriate care), how often are teams learning from defects and is culture improving.

    The unit champion or other member of the safety team should then work with your executive sponsor to schedule monthly executive safety rounds and post this schedule on a bulletin board that is accessible to unit providers. The unit team should invite all providers to attend these rounds. If possible, post a picture of the unit's senior executive partner and his or her contact information on the unit. This will help increase visibility of the executive and the program as well as help providers to feel comfortable addressing and contacting the executive.

- In preparation for executive safety rounds, the unit champion should brief providers regarding the purpose of partnering with a senior executive and ask them to be prepared to discuss their own safety concerns and suggestions for resolution during rounds. Make sure to repeat this preparatory step a few days before each safety round as a reminder to frontline providers and to collect any safety concerns from providers who will not be physically present on the day of rounds.

- During executive safety rounds, the patient safety team, senior executive, and unit providers should review any safety issues identified, particularly those related to CAUTI, and list them on a tracking log. An example of this log, the Safety Issues Worksheet for Senior Executive Partnership, is found in the CUSP Toolkit and Appendix C. You may want to start with one or two safety issues that do not require extensive resources to implement and up to two issues that need additional resources (require funds to implement) and note these on the form. Documenting safety issues that will be addressed based on the executive safety rounds is useful in tracking the impact of the initiative. It may be helpful to transfer the safety issues that you are working on to the Status of Safety Issues form (http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Status-of-Safety-Issues.pdf). Then, the executive partner and unit members can assign a contact person to champion all activities associated with each issue. As patient safety issues are resolved, they can be moved to the "Completed" section on the bottom half of the Status of Safety Issues form. Return this form to your unit champion so frontline providers on your unit can be kept informed about the progress of improvement interventions. Posting this form in a highly visible location where staff will see it regularly is a great way to increase staff awareness and encourage engagement.

- Part of patient safety rounds should include a discussion about the investigation of a safety defect identified using the Staff Safety Assessment (Appendix D). It may be best to wait until the second session with your senior executive before incorporating this tool in safety rounds. Waiting will provide an opportunity for your team and unit to undertake a trial run to see how the tool works so you are better able to explain the investigation process to your executive partner. This investigation process includes frontline staff and the executive using the Learning from Defects tool (Appendix E) to identify what systems-based safety problems contributed to the defect. This process will include a plan of action to resolve system defects that is documented on the Learning from Defects tool. Again, this is an ideal time to use your CUSP tools to address a safety issue related to CAUTI.

Understand the Science of Safety

When a mistake occurs, we too often assume that the error was the result of inexperience, a lack of supervision, or simply bad luck. However, the fact is that care is often delivered within poor systems or in the absence of systems altogether. The Science of Safety provides a conceptual framework and a common safety vocabulary that allows frontline providers to recognize, raise, and address safety defects at the system level. The goal of the Science of Safety training is to inform all

This step will help your unit staff to:

- Understand that safety is a system property
- Understand the basic principles of safe system design, including standardizing work, creating independent checks (checklists) for key processes, and learning from mistakes
- Recognize that the principles of safe design apply to technical as well as team work, and understand that teams make wise decisions when there is diverse and independent input

frontline providers and executive partners about the magnitude of the patient safety problem, provide a foundation for investigating safety defects from a systems perspective, and highlight how each staff member's involvement can make a significant difference to make care safer, particularly in regard to reducing the risk of CAUTI. A system is a set of parts interacting to achieve a goal, and the Science of Safety training emphasizes how each part or cog in the health care system contributes to the provision of care and is vital to bringing about sustainable change in the clinical setting.

The Science of Safety training includes two companion pieces. First, have your staff view the 23-minute *Science of Safety* video, part of the CUSP Toolkit. Next, ask your staff to read the transcript of Sorrel King's speech at the 2002 Institute for Healthcare Improvement (IHI) Conference [website removed]. Her speech retells the tragic death of her 18-month old daughter, Josie, from a series of errors. The *Science of Safety* video is available at http://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/videos/04a_scisafety/index.html as part of the CUSP Toolkit, and Sorrel King's speech is available on the Josie King Foundation web site at http://www.josieking.org/Home. [Note the speech transcript is no longer available on the Josie King Foundation web site, however other tools are available. An exerpt of the speech can be found at http://www.ihi.org/education/ihiopenschool/resources/Pages/Activities/WhatHappenedtoJosieKing.aspx].

TIP: As John Kotter recognizes, leading change requires a sense of urgency. The tragic death of Josie King brought this sense of urgency to Johns Hopkins. For another organization to relate and feel the same sense of urgency, they should focus on a safety event that occurred in their own organization. Revealing such an event may be difficult. Having a nurse manager or someone in a leadership capacity start a conversation about a safety event may help others to feel more comfortable and give permission for others to follow, thereby creating a safe environment in which to discuss psychological safety.

What the team needs to do:

- The CUSP team leader or nurse manager should ensure that all staff members watch the *Science of Safety* video within the first month of CUSP implementation. This can be challenging, and there is no one right way to accomplish this goal. One popular approach is to schedule large group training sessions. However, a smaller group or individual training can be used as well. For an example of how to track the completion of staff member training, see the Science of Safety Training Attendance Sheet (http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Science-of-Safety-Training-Attendance.pdf). You should share the video with your medical staff and house officers by screening the video at medical staff meetings and house staff educational sessions, which are already scheduled, rather than expecting physicians to attend a separate meeting.

  Staff members should discuss safety events on their unit, what systems may have led to the events, how the principles of safe design could be applied to

  After watching the *Science of Safety* video, staff members should be encouraged to discuss the important concepts they have learned, and how they might apply it to the CAUTI project.

improve safety, and how teams can improve communication. Also, be sure to work with administration to ensure that new frontline providers, who join the unit later, watch the *Science of Safety* video. One strategy is to include these presentations in the standardized orientation programs for new staff, agency staff, and new house officers and medical staff.

- The National Project Team recommends that the Staff Safety Assessment form (Appendix D), introduced in the previous section, be handed out at the end of the Science of Safety training session. This is also a good time to instruct staff regarding how to report safety concerns on the unit in the future, identify the executive partnering with the unit, and describe how Executive Safety Rounds will be conducted.

Identify and Learn from Defects

Frontline providers are the eyes and ears of patient safety. They possess the expertise and knowledge needed to improve safety. After being exposed to the Science of Safety, frontline providers are more aware of system level defects and are prepared to identify clinical or operational issues or defects, which may have the potential to affect patient safety. The NPT has found that one of the strongest determinants of safety culture is whether physician and nurse managers listen to and act on staff concerns regarding patient safety. Therefore, it is important to follow through once staff identify defects.

There are many sources to identify safety defects. Once defects are identified and prioritized, frontline providers can learn from them and implement improvement efforts. The Learning from Defects form (Appendix E) will help frontline providers investigate safety defects by examining one defect, identifying the factors that contributed to that defect, implementing and measuring changes to reduce the probability of the defect recurring, and summarizing what was learned from this investigation. The Learning from Defects (LFD) process seeks to answer four questions:

1) What happened?
2) Why did it happen?
3) What can you do to reduce risk?
4) How do you know risks were reduced?

The National Project Team asks that the safety team learn from at least one defect per quarter, preferably at least one per month. This defect can be a safety issue that is either related or unrelated to CAUTI. The process of learning from defects yields useful knowledge that can often be applied to various patient safety issues such as falls, medication errors, and handoffs in care. Because staff and physicians see CAUTIs all the time and view them as inevitable yet treatable, it is important to emphasize to staff that CAUTIs are painful for patients and often seed additional infection in the patient. Because of this, it is

> Identify and Learn from Defects: This step asks your staff to think about how the next patient on your unit may be harmed, particularly in regard to inappropriate urinary catheter use as well as introducing a structured process to learn from medical and other errors by examining: what happened; why it happened; what you did to reduce risk; and how you measure whether risks were actually reduced.

imperative that health care providers devote additional time and energy to education aimed at eliminating CAUTI. To encourage discussion and education on the topic, one may want to open a discussion about a recent CAUTI on the unit, or a general review of the current CAUTI rates. The discussion and following education steps are vital to the CAUTI project as they play an important role in staff education as they invite staff members to share factors they have observed on the unit that may be contributing to CAUTIs. To be encouraged to begin this step, staff and providers may:

- Complete the Staff Safety Assessment (Appendix D), which asks providers how the next patient will be harmed in their unit and what they think can be done to minimize patient harm or prevent this safety hazard from happening again
- Review other potential sources of information about defects, including your hospital's incident reporting system, risk management reports, liability claims, and morbidity and mortality conferences

Tap into frontline providers' tremendous knowledge about risks to patient safety. Incorporate the Learning from Defects process into activities undertaken with your senior executive. This includes completing the Case Summary Form (http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Case-Summary.pdf) that is part of the Learning from Defects process and sharing the learning both inside and outside the unit. The senior leader may want to encourage this type of sharing by asking, "Did you share your lesson learned recently through the Defects tool, and if so, with whom?" Some additional examples include: a communication book that is read and signed by all frontline providers, a dedicated bulletin board, or updates at routine staff meetings. In the Michigan experience, some units produced newsletters to share what was learned on the participating unit with others in the hospital. While these are examples, any form of dissemination that works for your individual unit is encouraged. It is important to share the Learning from Defects case summaries throughout your health system as events tend to be common among units.

What the team needs to do:

The CUSP team leader, or his or her designee, should distribute the Staff Safety Assessment form (Appendix D) to all clinical and nonclinical providers in the unit. One person should be assigned the task of handing out and collecting the safety assessment forms. To encourage staff to report safety concerns, establishing a collection box or envelope where completed forms can be dropped off anonymously may increase staff participation. All safety assessments should be:

- Grouped by common types of defects (such as communication, medication process, patient falls, supplies, etc.)
- Prioritized considering the following criteria: likelihood of harming the patient, severity of harm, how common it is, and likelihood that it can be defended against in daily work
- Shared with your senior executive partner. Note that one of the tasks of the senior executive is to help prioritize the unit's safety concerns. You have the option of saving this prioritizing

process for your meeting with your executive partner. You can use informal methods (for example, group consensus) or formal quantitative methods to prioritize the greatest risks (for example, rating risk of harm). It is important to understand that identifying and learning from defects is not a one-time event, but rather a continuous process. As your team identifies safety issues and implements interventions to make improvements, conduct new safety assessments to identify other defects. Take one defect identified on your unit such as a CAUTI, an incident report, sentinel event, liability claim, or defect identified from the Staff Safety Assessment (Appendix D), and complete the LFD tool. Each unit should complete at least one Learning from Defects tool (Appendix E) and the accompanying Case Summary Form (http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Case-Summary.pdf) per quarter.

While organizations have other modes of learning about risk, such as failure modes and effects analysis (FMEA) or root cause analysis (RCA), these processes can be burdensome and infrequent. The Learning from Defects process enriches FMEA and RCA by encouraging greater involvement of frontline staff, through a built-in process and accountability structure for implementing system changes as a result of input from staff, and a strong focus on the patient as the center of process changes. To manage and track safety activities, it may be easiest to transfer this information to the Status of Safety Issues Form (http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Status-of-Safety-Issues.pdf).

Implement Teamwork and Communication

Implement Teamwork and Communication: This step helps your unit learn and use specific tools that will help to improve teamwork, work processes, and communication on your unit.

The National Project Team has developed a series of practical tools to help teams improve communication and teamwork and address areas that may present hazards to safety on your unit. Table 4, provided below, highlights specific tools and their purpose within the CUSP framework. Copies of each tool are available on the AHRQ website at www.ahrq.gov/cusptoolkit/. Some of these tools are mentioned in this guide, and others will be discussed during the course of calls.

What the team needs to do:

Identify opportunities to improve teamwork and communication by reviewing the unit scores from the baseline safety culture assessment (the Hospital Survey on Patient Safety Culture, or HSOPS), and any barriers that the team identified while learning from a safety defect. Examples of this include poor teamwork climate, or nurses' fear to discuss catheter removal with physicians. Discuss with frontline providers how and where they want to improve communication, and select a tool that best addresses their concerns. Incorporate teamwork and communication tools into your team meetings and other project processes.

Tools

Table 4: CUSP Toolkit Resources

Name of Tool	Purpose	Appendix
Background Quality Improvement Team Form	Gather names, titles, and contact information for unit safety improvement teams.	A
Shadowing Another Profession	Identify and improve communication, collaboration, and teamwork skills between different practice domains.	B
Safety Issues Worksheet for Senior Executive Partnership	Identify safety issues and recommendations for improvement identified by frontline staff in conversation with a senior executive.	C
Staff Safety Assessment	Inventory threats to patient safety identified by frontline care providers.	D
Learning from Defects	Set up a local process to learn from and respond to defects locally, within the unit.	E
Daily Goals Checklist	Improve team communication regarding patient's plan of care.	F
Morning Briefing	Get everyone on the same page at the beginning of a day or shift, so that expectations are set and the day is more predictable	G

Table 5: Additional CUSP Implementation Tools

Name of Tool	Purpose	Link
Status of Safety Issues Form	Track previously identified safety issues and recommendations for improvement and status of improvement efforts.	http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Status-of-Safety-Issues.pdf
Science of Safety Training Attendance Sheet	Verify participation in screenings of the *Science of Safety* educational video.	http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Science-of-Safety-Training-Attendance.pdf
Case Summary Form	Analyze a case example of patient harm or a near-miss to identify system factors and opportunities for improvement.	http://www.hopkinsmedicine.org/armstrong_institute/_files/cusp_toolkit_new/Case-Summary.pdf
Culture Debriefing Tool	Provide a structured process to make culture results actionable.	https://cdn.community360.net/app/jh/JHAH/hsops/JHAH_HSOPS_Readit_Debrief_preparation_Fast%20_Facts_.docx

III. Interventions to Prevent CAUTI

There is clinical evidence that provides guidance in CAUTI prevention. In the acute care setting, prevention efforts must focus on three key steps to prevent CAUTI: appropriate urinary catheter use, proper catheter insertion and maintenance, and prompt catheter removal.

Step 1. Appropriate Catheter Use Intervention

The key elements of the Appropriate Catheter Placement Intervention include:

1. Insert urinary catheters only for appropriate indications. The evidence-based HICPAC/CDC Guideline specifies appropriate indications for urinary catheter insertion and use.
2. Consider alternatives to indwelling urinary catheters, including the use of bladder scanners to identify and manage urinary retention, condom catheters and non-invasive methods of measuring urine output.

Step 2. Proper Catheter Insertion and Maintenance Intervention

The key elements of the Proper Insertion and Maintenance Intervention include:

1. Ensure that only properly trained people who know the correct technique of aseptic catheter insertion and maintenance are given these responsibilities.
2. Insert catheters using aseptic technique and sterile equipment.
3. Maintain a sterile, continuously closed drainage system.
4. Do not disconnect the catheter and urinary drainage system unless the catheter must be irrigated manually because of obstruction.

Step 3. Prompt Catheter Removal Intervention

Remove catheters as soon as possible. Patients should be monitored daily for catheter use and if an appropriate indication for catheter use is no longer present, the catheter should be promptly removed.

Step 1: Appropriate Catheter Use Intervention

Ensure the catheter is indicated based on the HICPAC/CDC Guideline

In 2009, HICPAC and CDC recommended a list of appropriate and inappropriate indications for urinary catheter placement based on a critical review of the available medical literature. Because of the absence of high-quality studies examining indications for urinary catheterization, the recommended indications for catheter use primarily represented consensus expert opinion. After careful review of these indications, facilities may choose to slightly modify the HICPAC urinary catheter use criteria based on

institutional considerations, including patient profiles and care practices. The data collection process allows for these modifications to be accounted for as appropriate indications.

Appropriate indications for urinary catheterization based on HICPAC guidelines include the following:

1. Acute urinary retention or obstruction—Urinary catheters are indicated for the management of acute urinary retention due to mechanical obstruction. Urethral or bladder outlet obstruction is commonly related to benign prostatic hypertrophy, severe edema with penile swelling, urethral stricture or urinary blood clots. Urinary catheters also are indicated for acute urinary retention related to a neurogenic bladder most often related to spinal cord injury or progressive neurological disease or to medications that reduce bladder muscle contractility or sensation.

2. Accurate measurement of urinary output in critically ill patients—Catheters are indicated when accurate measurement of urinary output is required in critically ill patients receiving care in the intensive care setting. ICU patients who are hemodynamically stable and cooperative often do not require urinary catheters and are appropriate candidates for alternate means of measuring urine output (see ***Consider alternatives to indwelling urinary catheters*** subsection below).

3. Perioperative use in selected surgeries—Urinary catheters are indicated perioperatively for selected surgerical procedures. Catheters should be used when a surgery is expected to be prolonged, when a patient will require large volume infusions during surgery, or when there is a need for intraoperative urinary output monitoring. Catheters also are indicated for urologic surgeries or other surgeries on contiguous structures of the genitourinary tract. Urinary catheters should not be used routinely for patients receiving epidural anesthesia or analgesia. Among these patients, the risk of acute urinary retention can be reduced by prompt discontinuation of the epidural medication and by the use of bladder scanners to monitor for acute urinary retention in the immediate post-operative period (see ***Consider alternatives to indwelling urinary catheters*** subsection below).

4. To assist healing of perineal and sacral wounds in incontinent patients—This is a relative indication for urinary catheter use when there is concern that urinary incontinence is leading to worsening skin integrity in areas where there already is skin breakdown. Urinary catheters should not be used as a substitute for the use of skin care, skin barriers, and other methods to manage incontinence and limit skin breakdown.

5. Hospice/comfort/palliative care—This is an acceptable indication for catheter use in end-of-life care, if it helps with patient comfort.

6. Required immobilization for trauma or surgery—Urinary catheters may be used when patients require requires prolonged immobilization following trauma or surgery. Examples include instability in the thoracic or lumbar spine, multiple traumatic injuries, such as pelvic fractures, and acute hip fracture when there is risk of displacement with movement.

7. Chronic indwelling urinary catheter on admission—Patients admitted from home or an extended care facility with a chronic indwelling catheter are considered to have an acceptable indication for catheter use. Note, this indication is not listed as one of the HICPAC urinary catheter indications.

Inappropriate indications for urinary catheterization include the following:

1. Urine output monitoring outside the ICU—Monitoring urine output in patients receiving care outside of the ICU setting is not an appropriate indication for urinary catheter insertion and use, including the for patients with congestive heart failure who are receiving diuretics. Some potential solutions are use of urinals for men and hats for women (to monitor output), and accurate daily weights. For patients with congestive heart failure, consider involving the patients themselves. Providing patients with educational materials on how to document their urine output and daily weight may assist in this process.

2. Incontinence without a sacral or perineal pressure sore—Urinary catheters should not be placed for management of urinary incontinence. Patients admitted from home or from extended care facilities with incontinence manage their incontinence without problems before admission. Mechanisms to keep the skin intact need to be in place. Some potential solutions for the management of incontinence include use of skin barrier creams for protection, use of a bedpan, or assisting the patient up to the commode regularly. Check for any wet bed linen, and change linens if they are wet when the patient is being turned in bed. In addition, external ("condom") catheters may be an alternative to manage urinary incontinence in cooperative male patients without urinary retention or obstruction.

3. Prolonged post-operative use—Urinary catheters should be promptly discontinued within 24 hours or less of surgery unless there is an appropriate indication for continued post-operative catheter use (e.g., structural repair of urethra or contiguous structures, prolonged effect of epidural anesthesia, etc.).

4. Other inappropriate uses of urinary catheters:

    a. Patients who have been transferred from intensive care to a floor—A urinary catheter should be discontinued promptly after the patient has been transferred from the ICU to a floor.

    b. Morbid obesity or immobility—Morbid obesity or immobility should not be a trigger for urinary catheter placement. Patients who are morbidly obese have functioned without a urinary catheter prior to admission. The combination of immobility and morbid obesity may lead to inappropriate urinary catheter use. However, this may lead to more immobility with the urinary catheter being a "one-point restraint." Some potential solutions include toilet training every two hours, use of a bedpan or urinal, or assisting the patient out of bed.

c. Confusion or dementia—Patients with confusion or dementia should not have a urinary catheter placed unless one of the seven indications for appropriate placement is present. External "condom" catheters are an alternative to urethral catheters for the management of incontinence in male patients who are cooperative (see ***Consider alternatives to indwelling urinary catheters*** subsection below).

d. Patient request—Patient request should not be a reason for placement of unnecessary urinary catheters. Explain to the patient the risk of infection, trauma, and immobility related to the use of the urinary catheter, and consider providing the patient with educational materials on the risks of CAUTI. The only exception would be for patients who are receiving end-of-life or palliative care (appropriate indication #5 described above). For example, if a patient is on diuretics and does not want to move out of bed multiple times, a catheter should not be used. Education is key! Explain to the patient the increased risks associated with use of a urinary catheter: urine infection, skin breakdown, and deep venous thrombosis due to immobility.

What the team needs to do:

Ensure that unit teams and care providers are properly educated in the seven appropriate indications for urinary catheters and the four inappropriate indications outlined above. Several educational tools are available in the appendices of this manual and at http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html, including two posters on urinary catheters, a brochure, fact sheet, and pocket card, which all outline the seven indications for catheter use. See Table 6: CAUTI Prevention Policies and Educational Materials.

Consider alternatives to indwelling urinary catheters

Alternatives to an indwelling urinary catheter should be considered based on a patient's individual care needs. Why? In general, alternative devices and procedures provide a much lower risk of infectious complications, such as urinary tract infection. Additionally, these alternative methods can reduce or eliminate the non-infectious complications—such as discomfort and immobility—that are associated with indwelling urethral catheters.

Before placing an indwelling catheter, consider if these alternatives would be more appropriate:

1. Bedside commode, urinal, or continence garments: to manage incontinence. Additional planning and personnel resources may be required to ensure that patients are regularly prompted and assisted with voiding or assessed for incontinence.

2. Bladder scanner: to assess and confirm urinary retention, before placing catheter to release urine. Portable bladder ultrasound is a non-invasive portable tool for diagnosing and managing urinary outflow dysfunction. For example, portable bladder ultrasound are useful on medical, surgical or rehabilitation units to detect that a patient has insufficient urinary retention to justify

catheterization. Nurse-driven protocols and handheld bladder scanners have been shown to reduce the risk of CAUTI.[21]

3. Straight catheter: for one-time, intermittent, or chronic voiding needs. Intermittent catheterization is most often used in patients with neurogenic bladder or spinal cord injury, and lessens the risk of urinary tract infection. Intermittent catheterization is preferable to indwelling urethral or suprapubic catheters in patients with bladder emptying dysfunction. When the patient returns to the community, intermittent catheterization enhances patient privacy and dignity, and facilitates return to activities of daily living. It is important to perform intermittent catheterization at regular scheduled intervals to avoid over-distending the bladder. Among hospitalized patients, one-time or intermittent catheterization is often used in combination with a portable bladder ultrasound.

4. External "condom" catheter: appropriate for cooperative men without urinary retention or obstruction. External catheters are useful especially for management of incontinence in elderly male patients with dementia but remain underutilized.[22] In a randomized clinical trial among 75 male patients at a VA Medical Center, condom catheters reduce the cumulative risk of urinary tract infection or death and were better tolerated than indwelling urinary catheters.[23] When using condom catheters, it is important to choose an appropriate size to improve fit and adherence to limit the risk of urine leakage or penile trauma.

What the team needs to do:

Identify alternatives to indwelling urinary catheters that you plan to implement and the target populations. An example of a Bladder Scan Policy is available in Appendix J and can help your facility put this important method of reducing catheter use into practice.

Step 2: Proper Catheter Insertion and Maintenance Intervention

Properly Trained Clinicians

Ensure that only properly trained people who know the correct technique of aseptic catheter insertion and maintenance are given responsibility for catheter placement.

Aseptic Insertion of Urinary Catheters

Supplies necessary for placing urethral catheters include the following:

- Water-absorbent underpad
- Sterile drape
- Sterile gloves
- Preparation swabs
- Forceps
- Antiseptic solution
- Catheter
- Tubing
- Collection bag
- Sterile water for balloon inflation
- Lubricating jelly

Most of these supplies can be purchased as prepackaged kits. Catheters vary widely by design, size, and construction material. The Foley catheter, a double-lumen, straight-tip catheter, is used most frequently.

Always place urethral catheters under sterile conditions, wearing sterile gloves. If using a catheterization kit, remove the kit from its outer packaging, and open the inner paper wrapping to form a sterile field. To avoid contaminating the gloves, with washed hands carefully retrieve the absorbent pad from the top of the kit, and place it beneath the patient's buttocks, with the plastic side down. Then put the gloves on, and cover the patient's abdomen and superior pubic region with the drape. Organize the contents of the tray on the sterile field, on a bedside table within reach. Techniques for catheterization of female and male patients vary. The *New England Journal of Medicine* has published two widely referenced articles with accompanying instructional videos on catheterization of females and males.[24, 25]

Appropriate Maintenance of Urinary Catheters

- If there are breaks in aseptic technique, disconnection of tubing, or leakage from the bag, replace the drainage system. Disinfect the catheter-tubing junction before connecting to the new drainage system. If the catheter becomes contaminated, replace the catheter.

- Make sure urinary flow is not obstructed. Ensure the catheter is not kinked. Drainage bags should always be placed below the level of the patient's bladder to facilitate drainage and to prevent stasis of fluid. Urine in drainage bags should be emptied at least once each shift using a container designated for that patient only. Care must be taken to keep the outlet valve from becoming contaminated. Use gloves and perform proper hand hygiene before and after handling the drainage device.

- Do not change urinary systems routinely. Consider changing the urinary system in the event of infection, obstruction, or a break or leak of the closed system.

- Do not disconnect the closed system. Avoid irrigation unless necessary (such as in the case of a catheter obstruction). The catheter tubing junction should be disinfected before irrigation. When sampling urine, disinfect the sampling port. Also check the site for possible disconnection of the catheter from the drainage bag.

- Frequently washing the meatus with povidone-iodine or soap is not associated with lower infection risk. In fact, frequent meatal cleaning may be associated with increased risk of CAUTI. Routine perineal hygiene during daily bathing is appropriate.

- Only nursing staff, family members, or patients themselves who know the correct technique of aseptic insertion and maintenance of the catheter should handle catheters. Health care workers and others who take care of catheters should be given periodic education and training, stressing the correct techniques and potential complications of urinary catheterization.

What the team needs to do:

Implement a urinary catheterization policy such as the one found in Appendix I, which spells out care and maintenance guidelines in detail. The purpose of the policy is to standardize urinary catheterization to facilitate urinary drainage when medically necessary.

Step 3: Prompt Catheter Removal Intervention

Nurses and physicians should be aware of the indications for urinary catheter use and should continually monitor patient ongoing need for a catheter. Physicians should promptly discontinue catheters that are no longer needed or indicated, and nurses evaluating catheters and finding no indication should contact the physician to promptly discontinue the catheter.

One prominent reason for inappropriate catheter use is a lack of awareness among clinicians of current catheter use. In a study published in 2000, 18 percent of medical students, 22 percent of interns, 28 percent of residents, and 35 percent of attending physicians were unaware that the patients for whom they were responsible had an indwelling catheter.[26]

Reminders and stop orders

Reminders that a urinary catheter is still in use and stop orders are low cost and high impact methods of reducing the duration of catheter use and help to change the default mind set of healthcare providers from "persistent use" to "timely removal." Reminders can be written, verbal, or electronic (e.g., computer order entry) and may include appropriate indications to continue catheter use and alternatives to indwelling catheters. Reminders are especially useful at the time of transition of care (e.g, admission from the Emergency Department, transfer from ICU to floor, transfer from floor to rehabilitation unit) when direct nurse-to-nurse communication can prompt removal of catheters that are no longer indicated. Automatic stop orders prompt removal of urinary catheters based upon a specified

time (e.g., within 24 hours of surgery) or clinical criteria. In a systematic review of 14 studies of urinary catheter reminder systems, daily reminders and automatic stop orders reduced the overall risk of CAUTI by 48 percent and the average duration of catheter use by 2.6 days and were not associated with an increased rate of catheter reinsertion compared to standard care.[5]

What the team needs to do:

Daily monitoring of patient catheters is key. The Urinary Catheter Decision-Making Algorithm (Appendix M), Urinary Catheter Pocket Card (Appendix O), and Urinary Catheter Brochure (Appendix Q), all emphasize removal of catheters and can aid in reinforcing practices among teams.

Tools

A number of helpful tools to aid in implementing or expanding focused CAUTI prevention efforts can be found in the appendices and at http://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/cauti-hospitals/index.html. These tools are listed below in Table 6: CAUTI Prevention Policies and Educational Materials. Adaptation to the needs of your particular environment as needed is encouraged.

Table 6: CAUTI Prevention Policies and Educational Materials

Name of Tool	Purpose	Appendix
Checklists for Assessing Executive and Physician Champion Potential	Concrete examples of qualities to look for when considering executives or physicians to serve as project champions.	H
Urinary Catheterization Policy	Apply evidence-based practice to reduce CAUTI.	I
Bladder Scan Policy	Apply evidence-based practice to reduce CAUTI.	J
Urinary Catheter Poster (Option 1)	Educate caregivers in indications for catheter use.	K
Urinary Catheter Poster (Option 2)	Educate caregivers in: • Risks of catheter use • Indications and non-indications	L
Urinary Catheter Decision-Making Algorithm	Educate in catheter indications and need for monitoring.	M
Urinary Catheter Project Fact Sheet	Educate caregivers in: • The problem of CAUTI • Project goals • Indications • Catheter removal	N
Urinary Catheter Pocket Card	Educate caregivers in: • Catheter removal • Risks of catheter use • Indications and non-indications	O
Catheter Care Pocket Card	Educate caregivers in evidence-based practices in catheter maintenance.	P
Urinary Catheter Brochure	Educate caregivers in: • Catheter removal • Alternate solutions for incontinence • The problem of CAUTI • Catheter use algorithm • Indications and non-indications	Q
Infographic Poster on CAUTI Prevention	Educate caregivers on CAUTI Prevention	R
Intensive Care Unit Infographic Poster	Educate caregivers on CAUTI Prevention in the Intensive Care Unit	S
Nurse-Driven Protocol for Catheter Removal	Empower nurses to evaluate and discontinue unnecessary urinary catheters.	T
Skin Care in the Incontinent Patient	Educate caregivers on how to prevent skin breakdown.	U
CAUTI Event Report Template	Identify root causes of CAUTIs	V
Interpreting CAUTI Data Trends Tool	Evaluate your data submission rates and outcome data	W

IV. Measurement

Culture, Process, and Outcome Measures

The collection and reporting of data is an effective means of providing feedback to teams and supports improvement and sustainability. There are two goals in data collection and measurement for the national project as a whole: changes in the culture of safety and reduction of CAUTI rates. The overall goal of measurement is to determine the efficacy of each intervention.

To measure culture of safety, *On the CUSP: Stop CAUTI* employs AHRQ's Hospital Survey on Patient Safety Culture (HSOPS) to track changes in patient safety culture over time and to evaluate the impact of patient safety interventions. The survey is anonymous, with no individual staff identifiers. The survey will be administered twice during the project, once at baseline and again approximately 15 months later. *On the CUSP: Stop CAUTI* also uses a Readiness Assessment to determine the team's exposure to other interventions and their readiness to collect data. This assessment is completed by the Team Leader one time for the unit at the beginning of the project. Finally, a Team Checkup Tool is completed once per quarter by the team leader with input from the team to report on progress that has been made in the implementation of CUSP principles and barriers the team is facing.

For participating acute care units, there will be three periods of data collection and evaluation, during which CAUTI rates (outcome) data will be collected. Optional process data is collected during these periods as well, if the team decides to do so. The CDC National Healthcare Safety Network (NHSN) definitions are used for outcome data. [Note: The surveillance definition of CAUTI is updated approximately every year. Appendices X-AA contain the CAUTI definitions that were used during the conduct of Cohorts 1-4 of this project. The current updated CAUTI definition can be found at http://www.cdc.gov/nhsn/pdfs/pscmanual/7psccautiicurrent.pdf.] The HICPAC guidelines for appropriate indications are used for process data (see Section III).

Table 7 provided below details the culture, process, and outcome measures to be collected during *On the CUSP: Stop CAUTI.*

Table 7: Culture, Outcome, and Process Measures

DATA COLLECTED	DATA SOURCE	MEASUREMENTS
CULTURE/Hospital Survey of Patient Safety Culture (ACUTE CARE UNITS ONLY): Track changes in patient safety culture over time and to evaluate the impact of patient safety interventions	MHA Care Counts Or commercial survey vendors (e.g. Press Ganey) in format specified by MHA	15 domains: 1. Communication Openness 2. Feedback and Communication About Error 3. Handoffs and Transitions 4. Teamwork Across Units 5. Teamwork Within Units 6. Management Support for Patient Safety 7. Non-Punitive Response to Error 8. Supervisor/Manager Expectations & Actions 9. Promoting Patient Safety Staffing 10. Organizational Learning & Continuous Improvement 11. Frequency of Events Reported 12. Number of Events Reported 13. Patient Safety Grade 14. Overall Perceptions of Patient Safety 15. Overall Summary
CULTURE/Readiness Assessment (ACUTE CARE UNITS ONLY): Determine the team's exposure to other interventions and their readiness to collect data	Web-based survey	5 domains: 1. Hospital Information 2. Description of Clinical Area 3. Safety Activities 4. Catheter Management Strategies 5. CAUTI Prevention Practices
CULTURE/Team Checkup Tool(ACUTE CARE UNITS ONLY): Identify what has been implemented and identify any impediments to progress	MHA Care Counts	5 Elements 1. Measure Adaptive Implementation 2. Measure Technical Implementation 3. Monitor Progress 4. Behaviors Driving Performance 5. Barriers to Teamwork and Communication

Table 7: Culture, Outcome, and Process Measures (continued)

DATA COLLECTED	DATA SOURCE	MEASUREMENTS
OUTCOME (acute care) • Identify Number of Symptomatic CAUTIs attributable to your unit for the month • Number of urinary catheter days per month (number of patients with urinary catheter device is collected daily at the same time each day, and the total is summed for the month) • Number of patient days per month	NHSN MHA Care Counts	Symptomatic CAUTI rates: • Number of symptomatic CAUTIs divided by number of catheter days, multiplied by 1,000 • Number of symptomatic CAUTIs divided by number of patient days, multiplied by 10,000 • Data Collection Status • Prevalence Rate (catheter days divided by patient days)
PROCESS (acute care, optional) • Assess each patient on the unit for the presence of a urinary catheter • Record the reason for the catheter	MHA Care Counts	• Percent of Patients with a Catheter (Prevalence Rate: number of patients with catheters divided by total number of patients, multiplied by 100) • Data Submission Status • Appropriate/Inappropriate Catheter Indication Rates

Data Collection

Acute care teams should collect and enter data by teams into the web-based portal MHA Care Counts. The periods of data collection and the measures to be collected by acute care units are described below in Table 8.

Baseline data collection: Baseline refers to the period of time before staff members are formally educated about appropriate indications for urinary catheter use, and before instituting daily processes to evaluate the need for urinary catheters and to discontinue catheters that are no longer needed. Baseline data collection includes collection of prevalence and appropriateness (process) data and CAUTI rates (outcome) data.

Implementation period: Implementation refers to the period of time when staff education about appropriate indications for urinary catheters has been completed and a process has been instituted to evaluate the need for urinary catheters. Implementation data collection includes collection of prevalence and appropriateness (process) data and CAUTI rates (outcome).

Sustainability period: Data collection on all elements listed above will continue on a less frequent basis.

Table 8: Acute Care Data Collection Schedule*

TOOL/DATA COLLECTED	DATA COLLECTION SCHEDULE
HSOPS	• **Baseline** • **Implementation**: 15 months post baseline
Readiness Assessment	• **Baseline**: One time per unit at start of project
Team Checkup Tool	• **Implementation**: One tool completed each quarter
CAUTI Outcome Data • Number of symptomatic CAUTIs attributable to your unit for that month • Number of urinary catheter days per month (the number of patients with urinary catheter devices is collected daily at the same time each day, and the total is summed for the month) • Number of patient days per month	• **Baseline:** Collect monthly for three months • **Implementation:** Collect monthly for two months and quarterly thereafter • **Sustainability:** Quarterly
Prevalence and Appropriateness Process Data • Assess each patient on the unit for the presence of a urinary catheter • Record the reason for the catheter	• **Baseline:** Monday through Friday for three weeks • **Implementation:** Monday through Friday for two weeks, one day per week for six weeks, then one week (Monday through Friday) per quarter thereafter • **Sustainability:** one week (Monday through Friday) per quarter

* For dates specific to your Cohort, please consult your cohort-specific project calendar [website removed August 2015].

The data collection timeline correlates closely with project interventions, so it is imperative that feedback to teams and unit staff be given in real time to evaluate progress and modify processes as necessary.

Table 9: Data Collection Tools

Name of Tool/Reference	Purpose	Link
CAUTI Process Data Collection Tool	The form helps units to collect prevalence and appropriateness data.	http://catheterout.org/sites/webservices.itcs.umich.edu.drupal.BladderBundle/files/Data Collection Sheets_10.20.10.xlsx
NHSN Definition for Symptomatic CAUTI	Implement a surveillance process, including use of an indwelling urinary catheter, a positive urine culture, and the presence of certain clinical signs and symptoms.	Current definition: http://www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf [Note: Definitions that were in use during Cohorts 1-4 are provided in Appendices X-AA]
HICPAC Guidelines for Appropriate Indications	Continually assess patient need for urinary catheters.	http://www.cdc.gov/hicpac/cauti/001_cauti.html
Team Checkup Tool Questions	Share TCT questions with your team to gather their input in completing and submitting this quarterly data.	http://www.centerforpatientsafety.org/wp-content/uploads/2011/09/3 - CAUTI TCT.PDF

V. Implementing *On the CUSP: Stop CAUTI*

This section of the toolkit provides an overview of project implementation activities, ongoing education, data collection and evaluation, and project milestones. In this section the technical portion of the project (CAUTI reduction interventions) and the adaptive portion (CUSP) are integrated into a single project management resource. This resource should be used as a quick guide to implementing the program on your unit. You can use the planning worksheets for each stage to keep track of due dates and necessary resources specific to your unit.

Phase 1: Start-up

Table 10: Start-up Phase Worksheet

Implementation Step	Resources	Due Date
Participate in National Calls		
Download the Project Initiation Timeline		
Compile Project Manuals, Appendices, and Toolkits into one resource binder		
Select a Unit		
Gain Buy-in from CEO, Team, and Staff		
Registration		

Start-up

Participate in National Calls

Participate in the Orientation Webinar. The Orientation Webinar is an introductory 60 minute webinar that will provide an overview of the collaborative. Teams are encouraged to attend this call to get a better understanding of participation requirements. PowerPoint slides will be distributed to the State Leads prior to the call and may also be accessed on the national *On the CUSP: Stop CAUTI* web site. If teams are not able to attend this webinar, they may also access the recording, which will be available on the web site.

Download the Project Initiation Timeline

Download the project initiation timeline. Project Initiation timelines for participating acute care units are available for each cohort on the *On the CUSP: Stop HAI* website. Download the timeline specific to your cohort so that you are aware of important dates. [website removed August 2015]

Compile Project Manuals, Appendices, and Toolkits into one resource binder

Download project manuals, appendices, and toolkits from the *On the CUSP: Stop HAI* web site, and compile them into one resource binder so that all important documents are in a centralized location.

Select a Unit

Select a unit with at least moderate urinary catheter use as your target unit for this intervention. Evaluate units that have the highest urinary catheter utilization or units with increased non-indicated catheter utilization using point prevalence. Conduct a point prevalence to identify the unit with the highest usage of indwelling catheters, or work with your infection preventionist to determine the unit with the highest CAUTI rate. **Point Prevalence** is calculated using the following formula:

$$\textbf{Point Prevalence} = \frac{\text{(Number of urinary catheters)}}{\text{(Number of patients at one point in time)}} \times 100$$

Example: During a nursing shift change, count all urinary catheters in use, and then count the number of patients on the unit. Using the formula above, use these counts to calculate point prevalence for multiple units. Identify the unit to target first. In the example below, you can see that the team should start with Unit B, because Unit B has the highest prevalence.

	Number of Urinary Catheters	Number of Patients	Prevalence
Unit A	6	32	19
Unit B	10	29	34
Unit C	4	30	13

Gain Buy-in from CEO, Team, and Staff

Alert staff on your unit to the start of the project. Share the link to the webinar recording with them along with the information you receive from State Leads. Encourage them to join the initiative. Meet with your CEO and unit leaders to discuss the initiative and its benefits for your units.

Registration

Your State Lead will send you a list of documents to be completed during this time period. These include:

- Registration-Registration for acute care units is completed through an online form for Care Counts. The link to this form can be found on the website and will be sent to you by your State Lead.
- Registration for EDs is completed through the ED CDS Registration Information form, which can be found on the national program website.
- Data Use Explanation (DUE)-This form explains how we will use the data submitted by your hospitals. The DUE form, should your hospital choose to complete it, should be signed by your hospital's CEO's or authorized representative and returned to HRET.

- CEO Commitment Letter-The commitment to participate in the project is formed between your hospital and the state hospital association. It should be signed by your hospital's CEO's or authorized representative and returned to HRET.
- Unit Team Commitment Form-Each member of the participating teams should sign this form on page 3. A copy of the signed form should be given to the State Lead.

Phase 2: Planning

Table 11: Planning Phase Worksheet

Implementation Step	Resources	Due Date
Assemble Your Team		
Develop Processes for Project Implementation		
Participate in National Calls		
Attend Learning Session # 1- Kickoff Meeting		
Educate Staff		
Develop Educational Plan		
Lay Foundation for Data Collection		

Planning

Assemble Your Team

- Establish your multidisciplinary team, and obtain leadership support from nursing, physicians, and administration.

  Nursing: Identify a nurse leader to be the point person for your unit. Potential candidates include the nursing director, or a very effective nurse manager or charge nurse. This person will:
  - Explain the project to unit staff and the management team
  - Ensure that unit staff are educated about CAUTI and the appropriate indications for urinary catheter use
  - Facilitate use of teamwork tools to guide communications regarding the appropriateness of catheters and recommendations for removal of non-indicated urinary catheters
  - Support integration of CUSP into daily workflow and unit operations

Medical Staff: Identify a physician leader for the project on your unit. This could be a urologist, infectious disease specialist, hospitalist, quality/patient safety officer, or any physician with an interest in improving safety and quality. This physician will:

- Explain the project to medical staff who have patients on the unit
- Assist with education of medical staff about the rationale for implementing a CAUTI reduction project and the appropriate indications for urinary catheter use
- Participate in the CUSP activities of the project
- Encourage project support

Administration: Recruit a senior executive to be your unit sponsor and to demonstrate that this project is a priority for the hospital. Tips for recruiting and working with a senior executive are detailed in section I of this manual, which describes CUSP.

Develop Processes for Project Implementation

- Develop a process to evaluate the prevalence—and if your unit is an acute care unit, the appropriateness—of urinary catheters on your unit. The process should be one that best fits your unit. Consider making this a part of rounding process that already exists. Most importantly, the process for evaluating the appropriateness of catheters must be standardized and used consistently. Write this process up using the Hospital Unit Action Plan.
- Acute care units should determine who will contact the physician to request an order for discontinuance of inappropriate urinary catheters unless a nurse approved protocol for the removal of catheters exists.
    - Teamwork tools such as those found in the CUSP Toolkit or TeamSTEPPS, may be helpful to facilitate communication about the appropriateness of catheters and the recommendation for catheter discontinuance.
    - Consider revising current processes, policies and procedures to include automatic stop orders or removal protocols.
    - The process may be enforced by integrating it into the patient's daily nursing assessment.

Most importantly, the process for evaluating the prevalence and appropriateness of catheters must be standardized and used consistently.

Education

Participate in National Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include:

- National Onboarding Calls: This series of calls gives teams the background information necessary to participate in the project. They begin approximately two weeks after Learning Session #1 and continue biweekly.

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #1: Kickoff Meeting will occur in each state as the official program kickoff. This meeting provides an opportunity for your team to meet with the State Lead and other teams participating in the project.

Educate Staff

Educate unit staff on the science of safety and on appropriate indications for urinary catheter use.

- Watch the *Science of Safety* video with your unit:
    - This should include a formal instructional session about CAUTI, and appropriate indications for catheter use.
    - You may also provide staff with printed educational material, lectures, posters, and pocket cards found in the Appendices.
- The most important education occurs during rounds where a project champion discusses the appropriate indications for urinary catheter use with the unit staff:
    - A champion (usually a nurse, alternatively an infection preventionist, or quality improvement health care worker who is knowledgable of indications for urinary catheter utilization) participates in a daily process to assess each patient for the presence and appropriateness of urinary catheters.
    - This may occur during daily rounding, in which nursing staff assess each patient for urinary catheter presence. The nurses should be educated in the indications for urinary catheter utilization. If a patient has a urinary catheter, review the reasons for use with the nurse caring for the patient.
    - If there are no valid indications for the urinary catheter, the nurse should contact the physician to discontinue the urinary catheter.

Develop an Educational Plan

Develop a plan for ongoing education of staff (including physicians) about the appropriate indications for urinary catheter use and the proper care and maintenance of catheters. A key factor of success is a manager who supports the initiative and holds staff accountable for removing all non-indicated urinary catheters.

Data

Lay Foundation for Data Collection

Lay the foundation for data collection. Project success depends on the ability of hospital teams to successfully collect and submit data. Determine who will collect and submit your unit's data for this project.

Acute Care Unit Data:

- Prevalence and Appropriateness (Process)
- CAUTI Rates by patient days and catheter days (Outcome)
- Team Check-up Tool
- Hospital Survey on Patient Safety Culture (HSOPS)
- CAUTI Readiness Assessment
- Submit data according to the timelines outlined in Table 8: Acute Care Unit Data Collection Schedule.

Phase 3: Execution

Table 12: Execution Phase Worksheet

Implementation Step	Resources	Due Date
Utilize Teamwork and Communication Tools		
Learn from Defects		
On the CUSP: Stop CAUTI Team Meeting		
Attend Learning Session # 2- Midcollaborative Meeting		
Participate in National Calls		
Continuing Education		
Educate Other Units		
Baseline Data Collection		
Ongoing Data Collection		
Review Reports and Monitor Rates		
Use Data for Improvement		
Participate in State Coaching Calls		
State Site Visits		

Execution

Use Teamwork and Communication Tools

Use tools described in section five to improve teamwork and communication in your unit. Your *On the CUSP: Stop CAUTI* team can decide which tools are most appropriate for use in your unit.

Learn from Defects

- Investigate all infections.
- Regularly identify defects and walk through at least one defect each quarter with your team. Use this as an opportunity to learn from defects. This can occur at your CUSP team meeting or in another setting.

On the CUSP: Stop CAUTI Team Meeting

Meet at least once per month with your *On the CUSP: Stop CAUTI* team including your executive partner, team leader, nurse champion, and physician champion. Meet more frequently if your team finds it useful to do so. Use this time to assess changes that could be made to reduce harm and improve the culture of safety on your unit.

Education

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #2: Mid-collaborative meeting will occur in each state around the eighth month. This in-person meeting provides an opportunity for teams to assess progress, share data and discuss leadership and followership.

Participate in National Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include:

- National Onboarding Calls: Participate in the Onboarding Call Series. This series of five calls gives teams the background information necessary to participate in the project. They begin approximately two weeks after Learning Session #1 and continue biweekly.
- National Content Calls: Content calls are 60-minute conference calls led by national project faculty advisors. Teams should attend this call series following the conclusion of the Onboarding Call Series.

Continuing Education

- Educate any new staff who join your unit using the *Science of Safety* video.
- Use Learning from Defects and the Team Checkup Tool to ascertain places where education is still needed. Revisit slides, call recordings, or other materials for subjects on which your team needs more training.
- Give feedback on results of program implementation.

- Champion the program, and lead by example.
- Educate unit staff about improvements the team is making by:
    - Posting a CAUTI calendar banner
    - Displaying reminders around the unit
    - Holding unit education sessions
    - Sharing and recognizing achievements
    - Sharing data with staff by regularly posting reports for staff

Educate Other Units

Engage others outside of your unit and increase awareness of your team's efforts by:

- Displaying CAUTI posters outside of your unit
- Posting reminders outside of your unit
- Creating an elevator speech to inform others you meet in passing
- Including monthly progress reports on bulletin boards or in newsletters
- Post updates on hospital Intranet

Data

Collect Baseline Data

Acute Care Units:

- For baseline data, collect three weeks (Monday through Friday) of urinary catheter prevalence. Evaluate the need for urinary catheters, and determine the reason for all urinary catheters used.
- Complete and submit an initial Hospital Survey on Patient Safety Culture (HSOPS)
- Complete and submit the CAUTI Readiness Assessment one time per unit

Ongoing Data Collection

Data collection is not just an exercise in collecting information, but it is a key part of the intervention. Collection of the process data in particular provides an opportunity to discuss and reinforce the daily assessment of whether catheters are needed, identification of appropriate indications, and removal of the catheters that are no longer indicated.

Acute Care Units:

- For implementation data collection, process data should be collected once a day for two weeks (Monday through Friday) and then one day a week for the following six weeks. Outcome data should be collected for two full months every day according to the data collection schedule in Table 8. The patient's bedside nurse should note the catheter's presence and evaluate the indication during the patient's daily nursing assessment.
- Submit data into Care Counts and/or NHSN.
- Complete the quarterly Team Checkup Tool.

Review Reports, and Monitor Rates

Review reports at your *On the CUSP: Stop CAUTI* team meetings. Use these reports to monitor your rates and see where improvement is still needed. Prevalence reports are available on both Care Counts and CDS. You may also calculate the prevalence rate by taking the sum of urinary catheters used over a time period and dividing that number by the total patient days during that period.

Use Data for Improvement

Use data to inform the unit of areas where improvement is still needed, and post rates in a highly visible place where staff can easily see them.

Coaching Support

Participate in Coaching Calls

The National Project Team, Extended Faculty members and your State Lead will provide coaching support through regular coaching calls. These calls occur monthly during this period.

State Site Visits

The National Project Team and the Extended Faculty will visit hospitals in each state starting in the Execution phase of the collaborative. The hospitals will be chosen by the State Lead and the hospital(s) chosen will be contacted in advance of the visit.

Phase 4: Sustainability

Table 13: Sustainability Phase Worksheet

Implementation Step	Resources	Due Date
Use Teamwork and Communication Tools		
Learn from Defects		
On the CUSP: Stop CAUTI Team Meeting		
Attend Learning Session # 3: Final Meeting		
Participate in National Content Calls		
Continuing Education		
Educate Other Units		
Ongoing Data Collection		
Review Reports, and Monitor Rates		
Use Data for Improvement		
Participate in State Coaching Calls		
State Site Visits		

Use Teamwork and Communication Tools

Continue to use tools mentioned in section II to improve teamwork and communication in your unit. Your *On the CUSP: Stop CAUTI* team can decide which tools are most appropriate for use in your unit.

Learn from Defects

Continue to investigate all symptomatic infections and identify defects quarterly.

On the CUSP: Stop CAUTI Team Meeting

Meet at least once per month with your *On the CUSP: Stop CAUTI* team including your executive partner, team leader, nurse champion, and physician champion. Meet more frequently if your team finds it useful to do so. Use this time to assess changes that could be made to reduce harm and improve the culture of safety on your unit.

Education

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #3: Final meeting will occur in each state around the eighteenth month. This in-person meeting provides an opportunity for teams to celebrate their successes and discuss sustainability.

Participate in National Content Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include the National Content Calls and ED Quarterly Office Hours.

Continuing Education

- Educate any new staff who join your unit using the *Science of Safety* video
- Use Learning from Defects and the Team Checkup Tool to ascertain places where education is still needed. Revisit slides, call recordings, or other materials for subjects on which your team needs more training.
- Give feedback on results of program implementation.
- Champion the program, and lead by example.
- Educate unit staff about improvements the team is making by:
    - Posting a CAUTI calendar banner
    - Displaying reminders around the unit
    - Holding unit education sessions
    - Sharing and recognizing achievements
    - Sharing data with staff by regularly posting reports

Educate Other Units

Engage others outside of your unit and increase awareness of your team's efforts by:

- Displaying CAUTI posters outside of your unit
- Posting reminders outside of your unit
- Creating an elevator speech to inform others you meet in passing
- Including monthly progress reports on bulletin boards or in newsletters
- Post updates on the hospital Intranet

Data

Ongoing Data Collection

Acute Care Units:

- For ongoing data collection, process data should be collected once a day for one week (Monday through Friday) quarterly. Outcome data should be collected for one full month every day each quarter. This is outlined further in the data collection schedule in Table 8. During this period, the patient's bedside nurse should continue to note the catheter's presence and evaluate the indication during the patient's daily nursing assessment.
- Continue to submit data into Care Counts and/or NHSN.
- Complete and submit final Hospital Survey on Patient Safety Culture (HSOPS).

Review Reports, and Monitor Rates

Continue to review reports at your *On the CUSP: Stop CAUTI* team meetings. Use these reports to monitor your rates and see where improvement is still needed.

Use Data for Improvement

- Post rates in a visible area where staff can see them.
- If there is no improvement from the baseline, then evaluate the unit for reeducation and re-implementation of the program.

Coaching Support

Participate in State Coaching Calls

Your State Lead will provide coaching support through regular coaching calls. The frequency of these calls is determined by your State Lead.

State Site Visits

The National Project Team and the Extended Faculty will visit hospitals in each state starting in the Execution phase of the collaborative. The hospitals will be chosen by the State Lead and the hospital(s) chosen will be contacted in advance of the visit.

Project Milestones

Each phase of *On the CUSP: Stop CAUTI* has unique milestones for you to complete. The lists below summarize milestones for each stage. They are also illustrated in Graphic 2.

Phase 1: Start-up

- Participate in Orientation call

Phase 2: Planning

- Attend Learning Session #1: Kickoff Meeting
- Complete Hospital Unit Action Plan
- Complete the CAUTI Readiness Assessment
- Participate in Onboarding calls

Phase 3: Execution

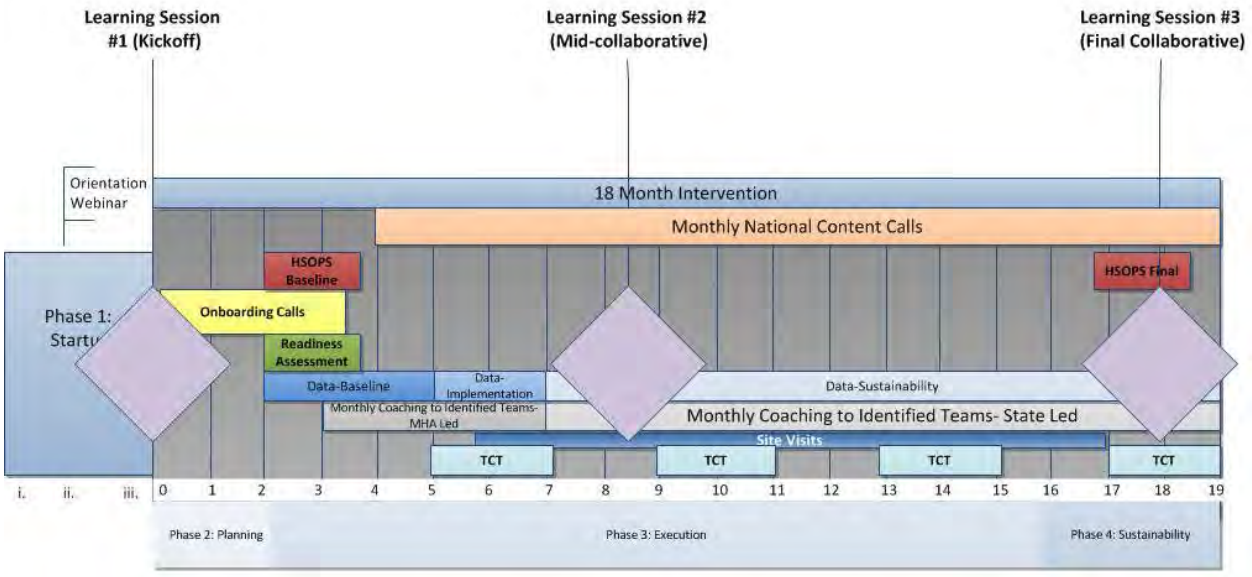
- Complete baseline HSOPS (acute care units only)
- Attend Learning Session #2: Mid-collaborative Meeting
- Collect process and outcome data, as appropriate for your unit type)
- Participate in Content Calls
- Participate in Coaching Calls
- Complete the Team Checkup Tool (acute care units only)
- If selected by State Lead, host a site visit

Phase 4: Sustainability

- Attend Learning Session #3: Final Meeting
- Collect quarterly process and outcome data (acute care units only)
- Complete final HSOPS (acute care units only)
- Participate in Coaching Calls
- Complete the Team Checkup Tool (acute care units only)
- If selected by State Lead, host a site visit

Timeline

Graphic 2: *On the CUSP: Stop CAUTI* Project Milestones



VI. Sustainability and Spread

Sustainability

Sustainability is marked by the ability to continue the components of *On the CUSP: Stop CAUTI* as part of routine workflows. This can be accomplished by building assessments into the daily work. Reinforce the importance of compliance with indications by presenting feedback data even after the period of required data collection has ended. Identify a facilitator who will take responsibility for reinforcing the process after the initial intervention is completed. This could be a nurse, a case manager, a discharge planner, or a team member of another discipline, but it should be someone who is committed to this role. Create a plan for continuation and integration. This could include education in orientation, annual competencies, or a strategy to address resurgent rates. It is important to understand that while the *On the CUSP: Stop CAUTI* program has a limited duration, it is based on the 4 E's, a cyclical, continuous process of improvement.

Successful sustainability will depend on having a trained champion to continue this effort on the unit; providing periodic feedback on performance to the unit's project team, nurses, medical staff and administration; and implementing CUSP principles on the unit, to emphasize patient safety, engage staff participation and encourage empowerment, and identify and learn from safety defects.

Spread Strategy

In the implementation stage, begin reaching out to teach other units about the initiative. Continue these activities over time to spread learning to other units. You may do this by displaying CAUTI posters outside of your unit, posting updates on the hospital intranet, or posting reminders outside of your unit. Simply put, spread within a hospital is about actively disseminating effective practices and knowledge about an intervention to all relevant care settings in the hospital.

To facilitate spread, consider volunteering to meet with interested units to share what you have learned or to communicate the success you've had in reducing CAUTI rates in your unit. Start with units with higher CAUTI rates. Share this manual and the other resources available on the project web site with the unit, and make yourself available to coach other unit teams in CAUTI prevention and in the CUSP model.

You may take a more proactive approach and offer to train team leaders to serve as mentors for other units. Teaching other units not only benefits the rest of your hospital, but it can also benefit you. Through teaching others, you can solidify your own knowledge of the subject plus learn from the unique challenges that other units face. It is also a way for your team to ensure equal protection for all patients in your hospital.

VII. Getting Help

Project contact information has been removed as the program ended August 2015.

For questions, contact either AHRQ (http://www.ahrq.gov) or HRET (http://www.hret.org/)

Table 14: Online Resources

Web Site	Focus	Available Resources
Project web site was removed August 2015. Publically available program materials can be found at http://www.ahrq.gov/professionals/quality-patient-safety/hais/index.html	The web site of the national, AHRQ-funded CUSP initiatives to eliminate HAIs, including *On the CUSP: Stop CAUTI*	STOP CAUTI > TOOLKITS AND RESOURCES • Sign-up and Registration • Timelines • CUSP Resources • Implementation Guide • Additional Resources STOP CAUTI > CALENDAR STOP CAUTI > EDUCATIONAL SESSIONS • Learning Session Recordings • Onboarding Call Information • Content Call Recordings and Slides
Web site removed August 2015	The secure, web-based data portal of *On the CUSP: Stop CAUTI*	Enter baseline and monthly CAUTI data, HSOPS data, and Team Checkup Tool data, and run reports to communicate progress to your team and senior leaders.
www.hretcds.org	The secure, web-based data portal of the ED Improvement Intervention	Enter project data and run reports to track and communicate progress.
www.cdc.gov/nhsn	Home of the National Healthcare Safety Network, the web-based surveillance system of the Centers for Disease Control and Prevention	ABOUT NHSN • Purposes of NHSN • Confidentiality • Use of Data NHSN MANUALS CONTACT NHSN
www.catheterout.org	A web site developed by a team of CAUTI experts that provides CAUTI prevention guidance along with supporting evidence.	Supporting Evidence Engaging Clinicians and Administrators

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Background Quality Improvement Team Information Form

Who should use this tool? Health care providers.

Please indicate people designated as <Insert Unit Type> Quality Improvement Team Members. Your team may not have people who serve in all of these roles.

These individuals from <Insert Unit Type> are members of the Quality Improvement Team.

Name & Title	Role	Phone & Email Address
	Content Specialist (e.g., Infectious Disease Physician, Intensive Care Physician)	
	<Insert Unit Type> Director	
	Hospital Patient Safety Officer or Chief Quality Officer	
	Nurse Champion	
	Nurse Educator	
	<Insert Unit Type> Nurse Manager	
	<Insert Unit Type> Nurses on team (list all)	
	<Insert Unit Type> Physicians on team (list all)	
	Respiratory Therapist	
	Senior Executive (Vice President or above)	
	Social Work, Support Staff (e.g., Technicians, Ward Clerks, Nurse's Aides)	
	Staff from Safety, Quality, or Risk Management Office	
	Unit Champion (Unit Team Lead)	
	Other Roles? (fill In below)	

We recommend redesigning this roster to meet the needs of your team and posting it in a prominent area.

Shadowing Another Professional Tool

Problem Statement: Health care delivery is a multidisciplinary practice that requires coordination of care among different professions and provider types. However, health care providers often do not understand other disciplines' daily responsibilities, teamwork, and communication issues, which inhibits the effective coordination of patient care.

How does shadowing another profession benefit the participant? Shadowing another provider will allow the shadower to gain a broader perspective of the role that staff in other professions play in patient care. The shadower will observe oral and written communication practices and problems and the effect they have on collaboration and teamwork. Shadowers will be able to identify communication and teamwork defects that may lead to poor patient outcomes.

Purpose of tool: This tool offers a structured approach to identify, and then improve, communication, collaboration, and teamwork defects among different practice domains that affect patient care delivery.

Who should use this tool?

- All staff involved in the delivery of patient care in units with poor Safety Attitude Questionnaire scores for teamwork and safety (less than 60 percent in the unit reporting a good teamwork or safety climate).
- Staff unfamiliar with responsibilities and practice domains of another profession.

How to use this tool: Review this tool before your shadowing experience to help you recognize teamwork and communication issues among practice domains that are important in patient care delivery. Use this document to identify problems observed in patient care areas within the practice setting of the individual you are shadowing. Spend 4 hours within another practice domain. Follow your health care provider through his or her daily activities and again at the end of the day:

I. Review your list of observed communication and teamwork problems. Be objective and use a systems approach to look at patient care delivery.
II. Discuss with the provider you shadowed what you believe may reduce communication errors and teamwork problems affecting patient care delivery within your practice domain.
III. Prepare a draft of the problems identified and your proposed solutions. Meet with the administration to discuss your findings.

Shadowing

I. **What happened during the shadowing exercise that involved multiple practice domains?** (Outline your observations. For this experience, put yourself in the place of the other provider and try to view the world as he or she does.)

II. **Put the pieces together.** Below is a framework to help you identify communication and teamwork issues that affect patient care and the teamwork climate in the unit. Please read and answer the following questions.

	Yes	No	N/A
1. Were any health care providers difficult to approach?			
How did that affect the effectiveness of the health care provider you shadowed (e.g., order ignored)?			
What was the final outcome for the patient (e.g., delay in care)?			
Did this unapproachable provider detract from the teamwork climate in the unit?			
Did the provider you shadowed seem comfortable working with this difficult provider?			
2. Was one provider approached more often for patient issues?			
If yes, was it because another health care provider was difficult to work with?			
If one provider was approached more often, what patient care issues evolved (e.g., delay in care delivery, provider overwhelmed)?			
3. Did you observe any error in transcription of orders by the provider you shadowed?			
4. Did you observe any error in the interpretation or delivery of an order?			
5. Were patient problems identified quickly?			
Were they handled as you would have dealt with them? Why or why not?			
Were there obstacles that prevented effective handling of the situation (e.g., lack of staff, equipment)?			
Did the providers involved seek help from a supervisor?			

	Yes	No	N/A
6. If you shadowed a nurse:			
Was the nurse's page or phone call returned quickly when there was an important issue? If yes, what was the outcome for the patient?			
Were patient medications available to the nurse when they were due? If no, what was the average wait time? How did the nurse react if the medication was late (e.g., anxious, angry, upset)?			
If the medications were delayed, could this affect the patient's outcome (e.g., delay in discharge to home)?			
7. If you shadowed a physician:			
Did the physician face obstacles in returning calls or pages? If yes, what were the obstacles?			
Did other factors affect the physician's ability to see patients? If yes, what were they?			
Did the physician receive clear information or instructions?			
8. If you shadowed a pharmacist:			
Did the pharmacist face obstacles in dispensing on time? If yes, what were the obstacles?			
9. How would you assess:			
Hand-offs: During the hand-off, were verbal or written communications clear, accurate, clinically relevant, and goal directed? (That is, did the outgoing care team debrief the oncoming care team regarding the patient's condition?) If no, explain why**.**			
Communication during a crisis*:* During a crisis, were verbal or written communications clear, accurate, clinically relevant, and goal directed? *(*That is, did the team leader quickly explain and direct the team regarding the plan of action?) If no, explain why.			

	Yes	No	N/A
Provider skill: Did the provider you shadowed seem skilled at all procedures he or she performed? If no, did he or she seek out a supervisor for assistance?			
Staffing: Did staffing affect care delivery? If yes, explain why.			

III. Now that you have shadowed a person in another profession, what will you do differently in your clinical practice to communicate more effectively?

IV. What suggestions do you have for improving teamwork and communication?

Specific Recommendations	Actions Taken

Safety Issues Worksheet for Senior Executive Partnership

Who should use this tool? Health care providers and the senior leader.

Date of safety rounds:_____
Unit:_____
Attendees:
1.
2.
3.
4.
5.
6.
7.
8.
9.

Identified Issues	Potential/Recommended Solutions	Resources Needed
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Staff Safety Assessment

Purpose of this form: This form is designed to tap into your experience at the front line of patient care to determine what risks are present in your unit that have jeopardized or could jeopardize patient safety.

Who should us this tool? Health care providers.

How to complete this form: Provide as much detail as possible when answering the two questions below. Drop off your completed assessment in the location designated by the unit team.

When to complete this form: This form can be filled out by any health care provider at any time. At a minimum, health care providers should complete this form semiannually.

Name (optional):

Job category:

Date:

Unit:

Please describe how you think the next patient in your unit or clinical area will be harmed.

Please describe what you think can be done to prevent or minimize this harm.

Thank you for helping to improve safety in your workplace!

Learn From Defects Tool

Problem statement: Health care organizations can increase the extent to which they learn from defects. We define this learning as reducing the probability that a future patient will be harmed. Most often clinicians recover from mistakes by reducing risks to the patient who suffered a defect.

What is a defect? A defect is any clinical or operational event or situation that you would not want to have happen again. This could include incidents that you believe caused patient harm or put patients at risk for significant harm.

Purpose of tool: The purpose of this tool is to provide a structured approach to help staff and administrators identify the types of systems that contributed to the defect and to followup to ensure safety improvements are achieved.

Who should use this tool? Health care providers.

All staff involved in the delivery of care related to a defect should be present when this defect is evaluated. At a minimum, this should include the physician, nurse, administrator, and other selected professionals as appropriate (e.g., for a medication defect, include pharmacy staff; for an equipment defect, include clinical engineering staff).

How to use this tool: Complete the form below for at least one defect per month. Investigate all of the following defects: Liability claims, sentinel events, events for which risk management is notified, cases presented at morbidity and mortality rounds, and healthcare-acquired infections.

I. Provide a clear, thorough, and objective explanation of what happened.

II. Review the list of factors that contributed to the incident and check off those that negatively and positively contributed to the outcome of the incident. Negative contributing factors are those that harmed or increased the risk of harm for a patient. Positive contributing factors limited the amount of harm. Rate the most important contributing factors that relate to the incident.

III. Describe how you will reduce the likelihood of this defect from happening again by completing the tables. Develop interventions for each important contributing factor, and rate each intervention for its ability to mitigate the defect and to carried out. Identify two to five interventions that you will use. List what you will do, who will lead the intervention, and when you will followup to note the intervention's progress.

IV. Describe how you know you have reduced the risk. Survey frontline staff involved in the incident to determine whether the intervention has been used effectively and whether risk has been reduced.

Investigation process

I. **What happened?** Reconstruct the timeline and explain what happened. For this investigation, put yourself in the place of those involved and in the middle of the event as it was unfolding to understand what they were thinking and the reasoning behind their actions or decisions. Try to view the world as they did when the event occurred.

II. **Why did it happen? Below is a framework to help you review and evaluate your case**. Please read each contributing factor and evaluate whether it was involved. If it was involved, did it negatively contribute (increase harm) or positively contribute (reduce impact of harm) to the incident? Rate the most important negatively contributed and positively contributed factors that relate to this event.

Contributing Factors	Negatively Contributed	Positively Contributed	N/A
Patient			
Patient was acutely ill or agitated. *(Elderly patient in renal failure, secondary to congestive heart failure.)*			
There was a language barrier. *(Patient did not speak English.)*			
There were personal or social issues. *(Patient declined therapy.)*			
Task			
Was there a protocol available to guide therapy? *(Protocol for mixing medication concentrations is posted above the medication bin.)*			
Were test results available to help make the care decision? *(Stat blood glucose results were sent in 20 minutes.)*			
Were tests results accurate? *(Four diagnostic tests done. Only MRI results needed quickly and results were faxed.)*			
Provider			
Was the provider fatigued? *(Provider was tired at the end of a double shift, or provider forgot to take a blood pressure reading.)*			
Did the provider's outlook or perception of his or her own professional role affect this event? *(Doctor followed up to make sure cardiac consult was done expeditiously.)*			

Contributing Factors	Negatively Contributed	Positively Contributed	N/A
Was the provider's physical or mental health a factor? *(Provider distracted with personal issues and missed hearing an order.)*			
Team			
Was verbal or written communication during hand-offs clear, accurate, clinically relevant, and goal directed? *(Oncoming care team was debriefed by outgoing staff regarding patient's condition.)*			
Was verbal or written communication during care clear, accurate, clinically relevant, and goal directed? *(Staff member was comfortable expressing his or her concern regarding high medication dose.)*			
Was verbal or written communication during a crisis clear, accurate, clinically relevant, and goal directed? *(Team leader quickly explained and directed his or her team regarding the plan of action.)*			
Was there a cohesive team structure with an identified and communicative leader? *(Attending physician gave clear instructions to the team.)*			
Training and Education			
Was provider knowledgeable, skilled, and competent? *(Nurse knew dose ordered was not standard for that medication.)*			
Did provider follow the established protocol? *(Provider pulled protocol to ensure steps were followed.)*			
Did the provider seek supervision or help? *(New nurse asked preceptor to help him or her mix the medication concentration.)*			
Information Technology or Computerized Physician Order Entry			
Did the computer or software program generate an error? *(Heparin was chosen, but Digoxin was printed on the order sheet.)*			
Did the computer or software program malfunction? *(Computer shut down in the middle of provider's order entry.)*			

Did the user check what he or she entered to make sure it was correct? *(Provider initially chose .25 mg, but caught his or her error and changed it to .025 mg.)*			
Local Environment			
Was there adequate equipment available and was the equipment working properly? (*There were two extra ventilators stocked and recently serviced by clinical engineering.)*			
Was there adequate operational (administrative and managerial) support? *(Unit clerk was out sick but an extra clerk was sent to cover from another unit.)*			
Was the physical environment conducive to enhancing patient care? *(All beds were visible from the nurse's station.)*			
Were there enough staff on the unit to care for patient volume? *(Nurse ratio was 1:1.)*			
Was there a good mix of skilled with new staff? *(There was a nurse orientee shadowing a senior nurse and an extra nurse to cover the senior nurse's responsibilities.)*			
Did workload affect the provision of good care? *(Nurse caring for three patients because another nurse went home sick.)*			
Institutional Environment			
Were adequate financial resources available? *(Unit requested experienced patient transport team for critical patients, and one was made available the next day.)*			
Were laboratory technicians adequately in-serviced or educated? *(Lab tech was fully aware of complications related to thallium injection.)*			
Was there adequate staffing in the laboratory to run results? *(There were three dedicated laboratory technicians to run stat results.)*			
Were pharmacists adequately in-service or educated? *(Pharmacists knew and followed the protocol for stat medication orders.)*			
Did pharmacy have a good infrastructure (e.g., policies and procedures)? *(It was standard policy to have a second pharmacist do an independent check before dispensing medications.)*			

Was there adequate pharmacy staffing? *(There was a pharmacist dedicated to the ICU.)*			
Does hospital administration work with the units regarding what and how to support their needs? *(Guidelines hold new ICU admissions in the emergency department when beds are not available in the ICU.)*			

Review the list of contributing factors above and identify the most important ones related to this event. Rate each contributing factor on its importance to this and future events.

Contributing Factors	Importance to Current Event, 1 (Low) to 5 (High)	Importance to Future Events, 1 (Low) to 5 (High)

III. **How will you reduce the likelihood of this defect happening again?** Develop an intervention for each important contributing factor identified. Develop interventions to defend against the two to five most important contributing factors. Refer to the ***Strength of Interventions*** chart below for examples of strong and weak interventions and then rate each intervention on its ability to mitigate the contributing factor and on the team's belief that the intervention will be carried out. Make an action plan for two to five of the highest scoring interventions.

Interventions To Reduce the Risk of the Defect	Ability To Mitigate the Contributing Factor, 1 (Low to 5 (High)	Team's Belief That the Intervention Will Be Implemented and Executed, 1 (Low) to 5 (High)

Select two to five of the highest scoring interventions and develop an action plan to put them in place.

Specific Interventions To Reduce the Risk of the Defect	Who Will Lead This Effort?	Followup Date

***Strength of Interventions**

Weaker Actions	Intermediate Actions	Stronger Actions
Double check	Checklists or cognitive aid	Architectural or physical plant changes
Warnings and labels	Increased staffing or reduced workload	Tangible involvement and action by leadership in support of patient safety
New procedure, memorandum, or policy	Redundancy	Simplify the process or remove unnecessary steps
Training and education	Enhance communication (e.g., check-back, SBAR)	Standardize equipment and process of care map
Additional study or analysis	Software enhancement or modifications	New device usability testing before purchasing
	Eliminate look-alike and sound-alike drugs	Engineering control of interlock (forcing functions)
	Eliminate or reduce distractions	

IV. **How will you know the risk is reduced?** Ask frontline staff involved in the defect whether the interventions reduced the likelihood of recurrence of the defect. After the interventions have been put in place, complete the "Describe Defect" and "Interventions" sections and have staff rate the interventions.

Describe Defect:		
Interventions	**Intervention Was Effectively Carried Out, 1 (Low) to 5 (High)**	**Intervention Reduced the Likelihood of Recurrence, 1 (Low) to 5 (High)**

Daily Goals Checklist

Problem statement: Clear communication among health care providers is paramount. Communication failures lead to patient harm, increased length of stay, provider dissatisfaction, and staff turnover. Effective communication is particularly important in the unit if complicated care plans are to be effectively managed by the care team.

What is a Daily Goals Checklist? A Daily Goals Checklist is a care plan that prompts staff to focus on what needs to be accomplished that day to safely move a patient closer to discharge.

Purpose of tool: This tool improves communication among care team and family members regarding the patient's care plan.

Who should use this tool: Health care providers.

How to use this tool: During morning and evening rounds, the care team uses the checklist to review the goals for a patient. Once a checklist is completed, the attending signs it and gives it to the patient's nurse so it can be kept at the bedside.

Publication of tool:
Pronovost PJ, Berenholtz S, Dorman T, et al. Improving Communication in the ISU Using Daily Goals. *J Crit Care* 2003; 18(2):71–75.

Daily Goals

Room Number_____ Date ___/___/___

	AM Shift (7 a.m.)	PM Shift (7 p.m.) Note Changes From AM in This Column
	Safety	
What needs to be completed for this patient to be discharged from the unit?		
▪ Patient's greatest safety risk? ▪ How can we decrease risk?		
What events or deviations need to be reported?		
	Patient Care	
Pain management/sedation (held to follow commands)?	Pain goal_____/ 10 w/_____	
Cardiac Review EKGs	Human Resources Goal_____ ☐ At goal ☐ Increase ☐ Decrease ☐ Beta Block_____	
Volume status Net goal for midnight	☐ Net even ☐ Net positive ☐ Net neg:_____ w/_____ ☐ Patient-determined	
▪ Pulmonary: ▪ Ventilator: (vent bundle; head of bed elevated), (ready to wean)	☐ Out of bed ☐ Pulmonary toilet ☐ Ambulation ☐ Maintain current support ☐ Wean as tolerated ☐ Mechanics every morning ☐ % inspired oxygen FIO2 <_____ ☐ Positive and expiratory pressure_____ ☐ Pressure support/tracheostomy trial____h	

	To Do	
Tests/procedures today	☐ N/A ☐ Tests completed: _____	
Scheduled labs	☐ N/A	
Morning laboratory tests, chest x-ray needed?	☐ Comprehensive metabolic panel ☐ Basic metabolic panel ☐ Coagulant clotting times ☐ Arterial blood gases ☐ Lactate ☐ Core 4 ☐ Chest x-rays Wed: ☐ Transferrin ☐ Iron ☐ Pre-albumin ☐ 24-hour urine	
Consultations	☐ Yes ☐ No	
	Disposition	
Is the primary service up to date?	☐ Yes ☐ No	
▪ Has the family been updated? ▪ Social issues addressed (long-term care; palliative care)?	☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Other—please explain:	

Systemic Inflammatory Response Syndrome (SIRS)/ infection/sepsis evaluation SIRS criteria ☐ Temp > 38° C ☐ < 36° C ☐ Heart rate > 90 BPM ☐ Respiratory rate > 20 b/min ☐ Amount of carbon dioxide in the arterial blood <32 torr ☐ White blood cells > 12K ☐ < 4K ☐ > 10% bands	☐ No current SIRS/sepsis issues ☐ Known infection: ☐ PAN culture ☐ Blood culture x2 ☐ Urine ☐ Sputum ☐ Other ☐ Antibiotic changes; discontinuation ☐ AG levels: ☐ Sepsis bundle	
Can catheters or tubes be removed?	☐ Yes ☐ No	
GI/nutrition/bowel regimen (Total parenteral nutrition line, NDT, PEG needed?)	☐ Total parenteral nutrition ☐ Total fluids ☐ Nothing by mouth	
Is this patient receiving deep vein thrombosis/peptic ulcer disease prophylaxis?	☐ Deep vein thrombosis: ☐ Heparin every 8 hours/every 12 hours/continuous drip ☐ Peptic ulcer disease prevention: ☐ Proton pump inhibitor ☐ Thrombo embolic deterrent stockings or sequential compression device ☐ Histamine blocker ☐ Low molecular weight heparin	
Anticipated LOS > 2 days: TGC 3 days: fluconazole by mouth or oral, potassium chloride SS	☐ Fluconazole ☐ Potassium chloride ☐ N/A	

Can any meds be discontinued, converted to “by mouth” or “oral, adjusted”?	☐ N/A ☐ Discontinued: ☐ By mouth or oral: ☐ Renal metabolized ☐ Liver metabolized	

Protocols available if bolded
For WICU only: ICU status IMC status: vitals q___ Fellow/Attg Initials: _____

Conducting a Morning Briefing

Problem statement: Physicians can improve communication with nursing staff while more efficiently prioritizing patient care delivery and admissions and discharges.

What is a Morning Briefing? A morning briefing is a dialogue between two or more people using concise and relevant information to promote effective communication before patient rounds in the inpatient unit.

Purpose of tool: This tool provides a structured approach to help physicians and nurses identify the problems that occurred during the night and potential problems that may occur during the clinical day.

Who should use this tool?

- Physicians who conduct patient rounds.
- Charge nurses and nurse managers who make patient assignments and are responsible for the entire patient population.
- Staff within the inpatient unit.

How to use this tool: Complete this tool by meeting with the charge nurse daily before starting patient rounds.

Briefing process

I. What happened overnight that I need to know about?

After receiving an update on the patients, proceed to Question II, unless there was an adverse event.

If an adverse event occurred, you should also use the Learn From Defects Form.

II. Where should I begin rounds?

Below is a framework to help you review your patient population and planned admissions and discharges. After answering the questions, you should be able to identify whether you should start rounds based on patient acuity or with the first patient to transfer to more efficiently prepare for the unit's first admission of the day.

	Yes/No	Name/Room and Bed Number
1. Is there a patient who requires my immediate attention?		Name:_____ Room/Bed: _____
2. Do you believe patients will be transferred out of the unit today?		Name:_____ Room/Bed: _____ Name:_____ Room/Bed: _____ Name:_____ Room/Bed: _____
3. Who has discharge orders written?		Name:_____ Room/Bed: _____
4. How many admissions are planned today?		
5. What time is the first admission?		
6. How many open beds do we have?		
7. Are there any patients having problems on the unit?		

III. Do you anticipate any potential defects during the day?

Specific Things To Consider	Problem Identified	Person Assigned To Followup	Action Taken
Patient scheduling			
Equipment availability or problems			
Outside patient testing or transportation needs			
Physician or nurse staffing			
Provider skill mix			

Appendix H. Checklists for Assessing Executive and Physician Champion Potential

Assessing CAUTI Executive Champion Potential for Success

The checklist in the right column provides some concrete examples to look for when considering a leader for senior executive champion. The chief executive officer can use this assessment tool to identify the senior executive who has the greatest potential for leading a catheter-associated urinary tract infection quality improvement project to achieve and sustain success. It provides a concise snapshot of some key roles, responsibilities, and tasks often lacking in support of hospital quality improvement efforts. It provides a checklist of personal and interpersonal characteristics that have been demonstrated to result in more effective interactions to keep the project moving forward. This resource is adapted from a checklist developed by Andrea Silvey, Ph.D., M.S.N., chief quality improvement officer of Health Services Advisory Group, Inc., the Medicare Quality Improvement Organization for Arizona, under contract with the Centers for Medicare & Medicaid Services, an agency of the U.S. Department of Health and Human Services.

Examples: Roles and Responsibilities of the Executive Champion	Examples: Characteristics for Success
• Serves as an administrative leader who provides staff time and organizational resources for implementing evidence-based practices aimed at increasing appropriate use and timely removal of indwelling urinary catheters. • Serves as the critical communication link between the hospital staff and executive leadership and between executive leadership and the medical staff. • Works with the chief executive officer to delineate executive champion roles and responsibilities for quality improvement in increasing appropriate use and removal of indwelling urinary catheters. • Verbalizes the importance of ongoing monitoring and reporting of process/outcome rates related to improvement interventions for increasing appropriate use and timely removal of	**Primary Characteristics** ☐ Authorized to commit resources for development, testing, implementation, ongoing monitoring, and reporting of improvement interventions and results ☐ Spoken of in a positive, respectful manner by medical and hospital staff ☐ Stays current on issues in patient safety, quality improvement, and risk-management through variety of sources

Examples: Roles and Responsibilities of the Executive Champion	Examples: Characteristics for Success
indwelling urinary catheters. • Works with the physician champion and the chief quality officer to delineate day-to-day leader roles and responsibilities for quality improvement in increasing appropriate use and timely removal of indwelling urinary catheters. • Attends rounds on the nursing units talking to patients, families, and staff to understand quality problems related to appropriate use and timely removal of indwelling urinary catheters. • Uses multiple forums—such as hospital staff meetings, impromptu discussions in the hallway, the employee cafeteria, et cetera—to disseminate information and share knowledge regarding appropriate use and timely removal of indwelling urinary catheters. • Communicates to both employees and medical staff the clinical value and relevance of appropriate use and timely removal of indwelling urinary catheters. (Practicing physicians can be skeptical about research evidence for a practice change. They tend to embrace principles more readily when they hear administrators emphasizing clinical outcomes over regulatory requirements or financial benefits.) • Questions the champion should be prepared to answer can include— ▪ What is the evidence to support the change? ▪ Why is the change necessary? ▪ Are there others who have already adopted the change? ▪ Is there value to the change, or is this change only for the sake of change? ▪ Why should I want to change (what's in it for me)? • Is prepared with data from professional journals, national groups, and leaders in the field that— ▪ Demonstrate the need for the change ▪ Support the evidence ▪ Demonstrate potential gaps between the evidence and practice • Provides an open access mechanism for the physician champion and day-to-day leader to	☐ Is flexible and controlled when under stress ☐ Is not afraid to speak his/her mind or to try to influence others, but does so in a way that respects the personal boundaries of others ☐ Able to discern mutual goals beyond apparent differences in order to build consensus ☐ Communicates truthfully and does not withhold relevant information ☐ Addresses others' concerns in a manner that is forthright and informed **Secondary Characteristics** ☐ Seen as wanting something for patients and families rather than for administration ☐ Easy to talk to or deal with, welcomes contact by others, makes time to attend to their issues, and shows interest in their views ☐ Able to defend self against aggressive incursions and foster self-control and respect in others ☐ Recognizes, perceives, and directly relates to the emotions of others

Examples: Roles and Responsibilities of the Executive Champion	Examples: Characteristics for Success
approach the leadership/ administration with ideas and roadblocks to changes. • Provides the quality improvement (QI) team with necessary time and resources. • Arranges for the necessary support to help schedule QI team meetings and circulate the agenda, minutes, materials, and other communications. • Advocates for the ongoing monitoring and reporting of process/outcome rates related to improvement interventions. • Receives and reviews verbal and written reports regarding team plans, progress, and barriers to progress. • Works with organizational leadership to remove barriers. • Is responsible for proposing solutions to address barriers in the hospital's culture and infrastructure that are impeding QI efforts and activities for increasing appropriate use and timely removal of indwelling urinary catheters.	☐ Shows appreciation for the efforts and contributions of others ☐ Able to wait patiently and recognizes the importance of "timing" when initiating change

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Assessing CAUTI Physician Champion Potential for Success

The checklist in the right column provides some examples of what to look for when considering a physician for physician champion. The chief executive officer and the chief medical officer can use this assessment tool to identify the physician who has the greatest potential for leading a catheter-associated urinary tract infection quality improvement project to achieve and sustain success. It provides a concise snapshot of some key roles, responsibilities, and tasks often lacking in support of hospital quality improvement efforts. It provides a checklist of personal and interpersonal characteristics that have been demonstrated to result in more effective interactions to keep the project moving forward. This resource is adapted from a checklist developed by Andrea Silvey, Ph.D., M.S.N., chief quality improvement officer of Health Services Advisory Group, Inc., the Medicare Quality Improvement Organization for Arizona, under contract with the Centers for Medicare & Medicaid Services, an agency of the U.S. Department of Health and Human Services.

Examples: Roles and Responsibilities of Physician Champions	Examples: Characteristics for Success
• Attends and actively participates in CAUTI team meetings. • Often described as a "voluntary leadership role" for a limited period of time. The literature equates the term with an opinion leader, a change agent, a physician who influences colleagues and friends. • An expert who provides education, champions a cause or product, or gives support to staff around the diffusion and implementation of clinical practice guidelines, protocols, or evidence for increasing appropriate use and removal of indwelling urinary catheters. • Able to influence other physicians to adopt or implement a new or revised process or guideline for appropriate use and timely removal of indwelling urinary catheters or to become physician champions themselves within their own practice groups. • Promotes autonomy by modeling behaviors, serving as an example to others, and providing information and guidance to other physicians. He or she works with the health care organization to provide feedback to other physicians about their performance on appropriate use and timely removal of indwelling urinary catheters. • Provides a vital link: A process change that is seen as advantageous by administrators may not be viewed as such from a practicing physician's perspective. The physician champion's role is positioned to serve as a liaison—updating administrators and physicians on project status, creating a mutual understanding of the needs of all parties, and facilitating a win-win solution to issues affecting processes and outcomes related to appropriate use and timely	**Primary Characteristics** ☐ Has a wide peer and social network and an extensive knowledge of how his/her colleagues interact with each other; perceived as credible and is respected by peers ☐ Highly knowledgeable and stays connected to his/her area of expertise through a variety of sources ☐ Willing to share knowledge with others ☐ Willing to support and advocate for process changes related to appropriate use and timely removal of indwelling urinary catheters ☐ Willing to implement new guidelines and serve as a resource for others ☐ Easy to talk to or deal with, welcomes contact by others, makes time to attend to their issues, and shows an interest in their views

Examples: Roles and Responsibilities of Physician Champions	Examples: Characteristics for Success

removal of indwelling urinary catheters.
• Uses his/her sphere of influence to promote changes for increasing appropriate use and timely removal of indwelling urinary catheters.
• Overcomes skepticism of practicing physicians about research evidence for appropriate use and timely removal of indwelling urinary catheters by verbally supporting and modeling the change.
• Shares the knowledge gained through implementation experience to ease the transition and narrow the gap between evidence and practice.
• Uses multiple forums to share information and knowledge, including—
  ▪ Presenting the process change at medical staff meetings
  ▪ Holding impromptu discussions in the hallway
  ▪ Sharing new evidence in a medical staff lounge
• Understands and recognizes the reluctance and hesitation by others to embrace changes related to appropriate use and timely removal of indwelling urinary catheters and addresses these concerns in a manner that is forthright and informed.
• Is prepared to answer questions that can include—
  ▪ What is the evidence to support the change?
  ▪ Why is the change necessary?
  ▪ Are there others who have already adopted the change?
  ▪ Is there value to the change, or is this change only for the sake of change?
  ▪ Why should I want to change (what's in it for me)?
• Is prepared with data from professional journals, national societies, and leaders in the field that—
  ▪ Demonstrate the need for the change
  ▪ Support the evidence
  ▪ Demonstrate potential gaps between the evidence and practice
  ▪ Compare an individual to others
• Leads peer discussions to build consensus for the changes related to appropriate use and timely removal of indwelling urinary catheters.
	☐ Is flexible and controlled in the face of stress, leading others by example
	☐ Is not afraid to speak his/her mind or to try to influence others, but does so in a way that respects the personal boundaries of others
	
	Secondary Characteristics
	☐ Able to defend self against aggressive incursions and foster self-control and respect in others
	☐ Able to discern mutual goals beyond apparent differences in order to build consensus among opposing parties
	☐ Holds that all people should be treated as equals
	☐ Recognizes, perceives, and directly relates to the emotions of others
	☐ Communicates truthfully and does not withhold relevant information
	☐ Shows appreciation for the efforts and contributions of others
	☐ Follows through with duties and takes the time necessary to get the job done correctly
	☐ Able to wait patiently and recognizes the importance of "timing" when initiating change

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Appendix I. Urinary Catheterization – Sample Policy

Purpose

The purpose of urinary catheterization is to facilitate urinary drainage when medically necessary. Urinary catheters should be evaluated every day for need and removed promptly when no longer necessary.

Urinary catheters are deemed medically necessary for the following reasons:

1. Urinary retention including obstruction and neurogenic bladder: The patient is unable to pass urine because of an enlarged prostate, blood clots, or an edematous scrotum/penis or unable to empty the bladder because of neurologic disease/medication effect.
2. Short perioperative use in selected surgeries (less than 24 hours) and for urologic studies or surgery on contiguous structures.
3. Need for accurate hourly output measurements to manage treatment in intensive care units.
4. Assistance with healing of perineal and sacral wounds in incontinent patients to avoid further deterioration of wound and skin when alternative methods are ineffective.
5. Required strict immobilization for trauma or surgery.
6. Hospice/comfort care or palliative care, if requested by patient.

Background

Urinary catheterization is the aseptic process of inserting a sterile hollow pliable tube into the urethra to facilitate urine drainage into a closed bag system. The urinary tract is the most common site of hospital-acquired infections, accounting for approximately 40 percent of hospital infections. The intent of this policy is to not only give guidance for urinary catheter maintenance techniques, but also to assist in the prevention of catheter-associated urinary tract infections.

Policy

1. General

1.1 Urinary catheters should be inserted *only* when medically necessary and should be evaluated daily for need. Urinary catheters should not be used solely for the convenience of health care workers. Document attempts at and inadequacy of alternative methods for bladder elimination prior to insertion of the indwelling catheter.

1.1.1. Alternative methods include:

- Programmed toileting, which consists of placing the patient on the bedpan or commode every 2-4 hours while awake.
- Utilizing a bladder scan machine for suspected urinary retention (refer to the Bladder Scan Policy, Appendix C of the Implementation Guide,for guidelines).

1.2 Urinary catheters should be placed only under the direction of a physician order. However, if the patient's nurse does not deem the urinary catheter meets the indications for placement, the patient's nurse should question the need.

2. Insertion/Application

2.1 Indwelling, straight, and suprapubic urinary catheters should be inserted using aseptic technique and sterile equipment.

2.1.1. Sterile gloves, drape, and sponges; an appropriate antiseptic solution for periurethral cleaning and a single-use packet of lubricant jelly should be used for insertion.

2.2 The smallest bore catheter possible should be utilized to minimize urethral trauma and irritation.

2.2.1. Coude catheters may be placed by nursing staff based on urology orders.

2.3 Indwelling catheters should be properly secured after insertion to prevent movement and urethral trauma.

2.4 Patients who perform self-catheterization at home should be encouraged to continue performing this procedure while in the hospital.

2.4.1. Patients performing self-catheterization should utilize clean technique.

2.4.2. Nursing personnel should evaluate the patient's performance and reinforce positive behaviors.

3. Maintenance

3.1 Standard Precautions: Use gloves when manipulating the catheter site and drainage system and practice hand hygiene before and after.

3.2 A sterile, continuously closed drainage system should be maintained for indwelling and suprapubic catheter systems.

3.3 If there are breaks in aseptic technique, disconnection of tubing, or leakage from the bag, or if the catheter becomes contaminated, the catheter should be replaced.

3.4 Drainage bags should always be placed below the level of the patient's bladder to facilitate drainage and prevent stasis of urine.

3.5 Urine in drainage bags should be emptied at least once each shift using a container designated for that patient only. Care must be taken to keep the outlet valve from becoming contaminated. Use gloves and practice hand hygiene before and after handling the drainage device.

3.6 Patients with urinary catheters will have intake and output recorded. However, urinary catheters are not to be inserted *simply* to monitor outputs with the exception of in intensive care units when accurate hourly output assessment is necessary for management. Make use of other means to monitor outputs in the incontinent patient, such as daily weights.

4. Catheter Change

4.1 Catheters of postop urology patients should only be changed or removed with urology's approval.

4.2 Catheter change: The interval between catheter changes should be determined by the individual patient's needs. Indications for change may include mechanical dysfunction or blockage of the urinary catheter system, and contamination of the closed system.

4.3 Indwelling catheters should not be changed at arbitrary fixed intervals.

5. Meatal Care

5.1 Meatal care: Cleansing the meatal surface during daily bathing is appropriate. The periurethral area should not be cleaned with antiseptics in patients with indwelling urinary catheters.

6. Specimen Collection

6.1 Small-volume urine specimens should be obtained by inserting a sterile needle/syringe into a disinfected sampling port and aspirating the urine. Generally,

urine cultures should be obtained prior to starting antibiotics for patients with suspected urinary tract infections.

6.2 Regular bacteriologic monitoring of catheterized patients is not recommended.

6.3 The patient with an indwelling catheter should be monitored for signs of catheter-associated urinary tract infection such as fever, chills, or suprapubic pain.

7. Responsible Persons

7.1 Only persons (e.g., nursing staff, family members, or patients themselves) who know the correct technique of aseptic insertion and maintenance of the catheter should handle catheters. Health care workers and others who take care of catheters should be given periodic education and training, stressing the correct techniques and potential complications of urinary catheterization.

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Appendix J. Sample Bladder Scan Policy

Purpose

To provide guidelines for the use of a bladder scanner.

Definition

The bladder scan measures ultrasonic reflections within the patient's body to differentiate the urinary bladder from the surrounding tissue. It is a noninvasive portable tool for diagnosing, managing and treating urinary outflow dysfunction.

Bladder scans—

- Determine the need for catheterization.
- Reduce the unnecessary placement of a urinary catheter.
- Provide quick measurements for postvoid residual (PVR) and/or bladder capacity.

Policy

1. A bladder scan should be considered for use with patients exhibiting acute or chronic urinary dysfunction.
2. A bladder scan should not be used if the patient has open skin or a wound in the suprapubic region, or if the patient is pregnant.
3. A bladder scan should not be used in the presence of flammable anesthetics.
4. If a bladder scan is used to assess for postvoid residual (PVR)—
   - 4.1 The amount voided should be documented on the report.
   - 4.2 If the PVR is greater than 200 cc, the patient should initially be straight catheterized (per physician order), avoiding urinary catheterization (Foley) placement if at all possible.
   - 4.3 If straight catheterization is performed after the scan, the amount of urine obtained should be recorded.

Responsible Persons

Determine what nursing care positions will be able to be trained at your facility.

Equipment

Equipment includes bladder scanner, scan head, plug, battery and stand, ultrasound transmission gel, and top-loading printout paper.

BLADDER SCAN PROCEDURE*	RATIONALE/EMPHASIS
1. Put on clean (nonsterile) gloves.	
2. Clean off scanner head before and after each patient use according to manufacturer instructions using hospital-approved disinfectant.	
3. Check that battery is in place and probe is plugged in.	
4. Scan may be done with patient in sitting or supine position.	
5. Remove or adjust patient's clothing to expose abdominal area.	
6. Turn bladder scanner on. Self-testing will display on panel as well as identifying buttons.	
7. Press scan and then note gender. (NOTE: If the patient is female and has had a hysterectomy, use the male key for gender. If the patient is very thin or obese, use more ultrasound gel. For patients with large amounts of lower abdominal hair, apply the gel directly to the skin. Advise the patient the gel will be cool.)	
8. Apply gel to the scanner head, being careful to remove air bubbles.	
9. Place scanner head about 1 inch above symphysis pubis, pointing slightly down toward the expected bladder location. Make sure the head of icon on the scan head is pointed towards the patient's head.	
10. Press the "scan" button making sure to hold scanner steady until you hear a beep. The bladder scanner will display the volume measured and an aiming display with crosshairs. If the crosshairs are not centered on the bladder, adjust the probe and rescan until they are properly centered.	
11. When you are satisfied the results are accurate, press the "done" button. The bladder scan will display the largest volume measured for the longitudinal and horizontal areas.	
12. Press "print," and the measurement will be printed on paper.	
13. Bladder Scan Safety/Helpful Tips	

BLADDER SCAN PROCEDURE*		RATIONALE/EMPHASIS
13.1	This scan should never be used for fetal heart tones.	
13.2	Use care with suprapubic and pelvic surgical patients.	Scar tissue, surgical incisions, sutures, or staples can affect scan accuracy.
13.3	If the screen shows a "greater than" symbol (>) next to the bladder volume measurement, then you do not have the bladder within full range of the scan head, and the patient's true bladder volume is greater than the volume displayed. To achieve an accurate measurement, reposition the scan head and repeat the scan. An exception occurs when the volume shown is greater than a specific threshold, e.g., 999 cc; in this case, the bladder is within full range of the instrument and the reading displayed is accurate.	In some instances, the bladder may be too full to scan accurately. Repositioning or re-aiming the scan head will do little to improve accuracy, but readings can still be clinically useful even if they underestimate true bladder volume.
13.4	The bladder scan computes the volume of the bladder based upon multiple cross-sectional images of the bladder. **Be sure to hold the scan head motionless during scans.**	
13.5	The most accurate measurements are obtained when the patient is resting quietly in the supine position.	
13.6	The accuracy of the result is compromised if the user does not obtain an optimal, reportable image.	
13.7	The patient should not have a urinary catheter in the bladder.	This could affect the accuracy of the instrument by creating micro bubbles in the bladder.
14. To save power, the bladder scan will turn itself off when not in use.		

*Also refer to operator's manual from the manufacturer.

Bibliography

Portable bladder ultrasound: an evidence-based analysis. Ont Health Technol Assess Ser. 2006;6(11):1-51. PMID: 23074481.

Appendix K. Poster on Indications for Urinary Catheters

In lower right, use Adobe Acrobat Pro to insert contact information for your institution.

Does your patient **really** need that catheter?

Appropriate indications for urinary catheters include:

- Perioperative use in selected surgeries
- Acute urinary retention or obstruction
- Hospice/comfort care/palliative care
- Accurate measurement of urinary output in critically ill patients
- Required strict immobilization for trauma or surgery
- Assistance in healing of severe perineal and sacral wounds in incontinent patients

Questions?
[insert contact information]

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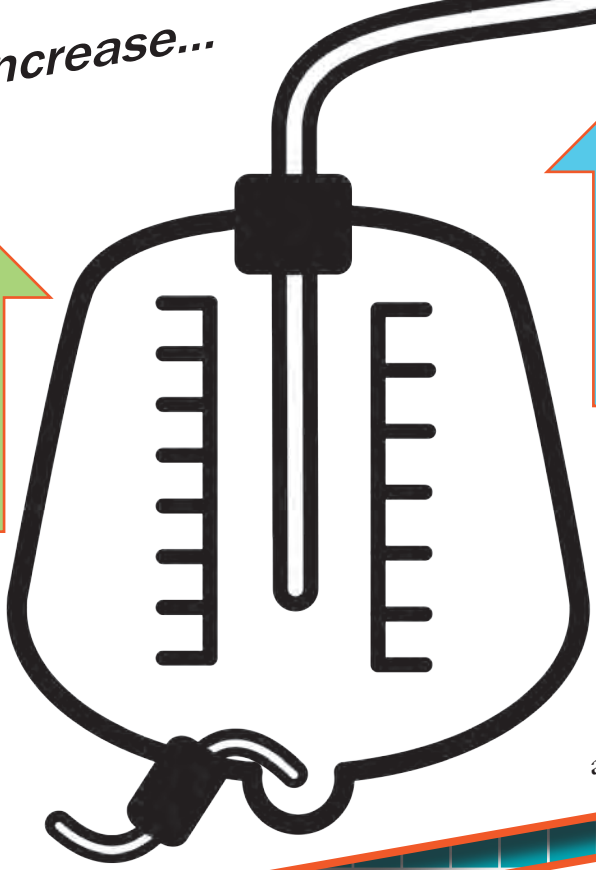
September 2015

Appendix L. Poster on Urinary Catheter Risks and Indications

REMOVE IT!

Urinary Catheters Increase...



- Length of Stay
- Cost
- Likelihood of Infection
- Patient Discomfort
- Antibiotic Use

...and patients with urinary catheters tend to stay in bed, increasing risk of skin breakdown, deep-vein thrombosis, weakness and delirium.

Urinary Catheters Are Indicated for...

- Acute urinary retention or obstruction
- Perioperative use in selected surgeries
- Assistance of healing of severe perineal and sacral wounds in incontinent patients
- Hospice, comfort care, or palliative care
- Required strict immobilization for trauma or surgery
- Accurate measurement of urinary output in critically ill patients (intensive care)

Catheters Are NOT Indicated for...

- Routine urine output monitoring outside the ICU
- Incontinence
- Prolonged postoperative use
- Morbid obesity
- Immobility
- Confusion or dementia
- Patient request

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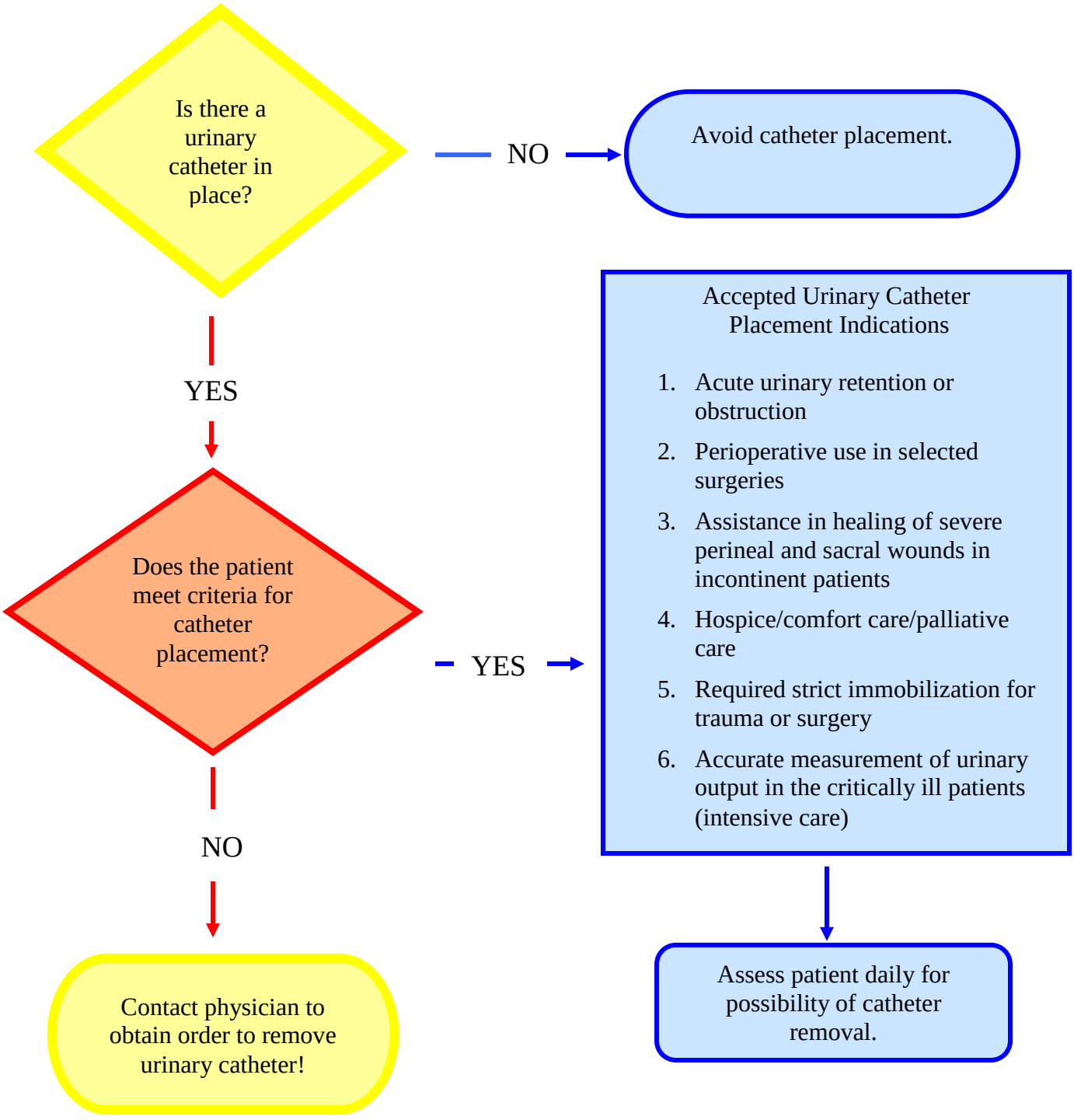
Appendix M. Urinary Catheter Decision-Making Algorithm



Appendix N. Urinary Catheter Project Fact Sheet

Urinary Catheter Project

Background

- 600,000 patients develop hospital-acquired urinary tract infections per year.
- 80% of these are urinary catheter associated.
- Approximately half of the patients with a urinary catheter do not have a valid indication for placement.
- Each day a urinary catheter remains, the risk of a catheter-associated urinary tract infection (CAUTI) increases 5%.

Goals

- To decrease CAUTI
- To improve patient safety
- To teach nurses the indications for urinary catheter use
- To reduce the unnecessary use of urinary catheters in the inpatient setting

Prevention of CAUTI

Follow criteria indicated for a urinary catheter:

- Acute urinary retention or obstruction
- Perioperative use in selected surgeries
- Assistance in healing of severe perineal and sacral wounds in incontinent patients
- Hospice/comfort care/ palliative care
- Required immobilization for trauma or surgery
- Accurate measurement of urinary output in critically ill patients (intensive care)

Remember: promptly remove unnecessary urinary catheters!

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Appendix O. Urinary Catheter Pocket Card

Front	Back
REMOVE THAT URINARY CATHETER! Foley catheters can cause: • ↑ **Infections** • ↑ **Length of Stay** • ↑ **Cost** • ↑ **Patient Discomfort** • ↑ **Antibiotic Use** Urinary catheters confine patients to bed, making them more immobile and thus increasing their risk for skin breakdown. **PREVENTION IS KEY.** **OBTAIN ORDERS TO DISCONTINUE UNNECESSARY URINARY CATHETERS!**	**REMOVE THAT URINARY CATHETER!** Foley Catheters ***are*** indicated for: ▪ Acute urinary retention or obstruction ▪ Perioperative use in selected surgeries ▪ Assistance in healing of severe perineal and sacral wounds in incontinent patients ▪ Hospice/comfort/palliative care ▪ Required strict immobilization for trauma or surgery ▪ Chronic indwelling urinary catheter on admission ▪ Accurate measurement of urinary output in critically ill patients (intensive care) Foley Catheters are ***not*** indicated for: ▪ Routine urine output monitoring OUTSIDE intensive care ▪ Incontinence ▪ Prolonged postoperative use ▪ Morbid obesity ▪ Immobility ▪ Confusion or dementia ▪ Patient request

Appendix P. Catheter Care Pocket Card

Interventions To Prevent CAUTI in Patients Who Have a Documented Medical Need for Indwelling Urinary Catheter

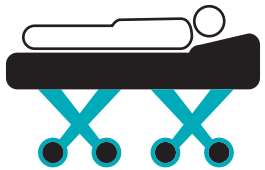
Prevention strategies must focus on clear indications for the insertion of a urinary catheter and prompt removal when no longer necessary. When an indwelling urinary catheter is indicated, the following interventions should be in place to help prevent infection:

- Use indwelling catheters only when medically necessary
- Use aseptic insertion technique with appropriate hand hygiene and gloves
- Allow only trained health care providers to insert catheter
- Properly secure catheters to prevent movement and urethral traction
- Maintain a sterile closed drainage system
- Maintain good hygiene at the catheter-urethral interface
- Maintain unobstructed urine flow
- Maintain drainage bag below level of bladder at all times
- Remove catheters when no longer needed
- Do not change indwelling catheters or drainage bags at arbitrary fixed intervals
- Document indication for urinary catheter on each day of use
- Use reminder systems to target opportunities to remove catheter
- Use external (or condom-style) catheters if appropriate in men
- Use portable ultrasound bladder scans to detect residual urine amounts
- Consider alternatives to catheters, such as intermittent catheterization and portable ultrasound bladder scans to detect residual urine amounts

Appendix Q. Urinary Catheter Brochure

Patient Management for Incontinence

- Turn patient every 2 hours to cleanse area and change linens.
- Use quilted pad under patient.
- Use skin barrier creams.
- Start toilet training program: Offer bedpan or commode with assist every 2 hours.



Urinary Catheter Initiative Champions

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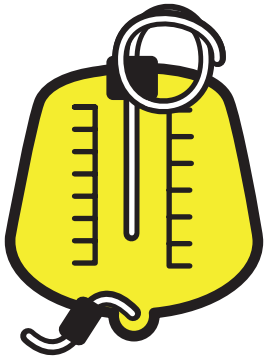
September 2015

Promptly Remove Urinary Catheters



Focus on Patient Safety

Urinary Catheter Facts

- 600,000 patients develop hospital-acquired urinary tract infections (UTI) every year.
- Of these infections, 80 percent are from a urinary catheter.
- About half of patients with a urinary catheter do not have a valid indication for placement.
- Each day the urinary catheter remains in place the risk of a UTI increases 5 percent.

Evaluation of Urinary Catheter Need

Indications for Urinary Catheters

- Acute urinary retention or obstruction
- Perioperative use in selected surgeries
- Assistance in healing of severe perineal and sacral wounds in incontinent patients
- Hospice/comfort care/palliative care
- Required strict immobilization for trauma or surgery
- Accurate measurement of urinary output in critically ill patients (in intensive care)

Urinary Catheters Are NOT Indicated for...

- Urine output monitoring outside the ICU
- Incontinence
- Patients transferred from intensive care to general units
- Prolonged postoperative use
- Morbid obesity
- Immobility without a sacral or perineal pressure sore
- Confusion or dementia
- Patient request

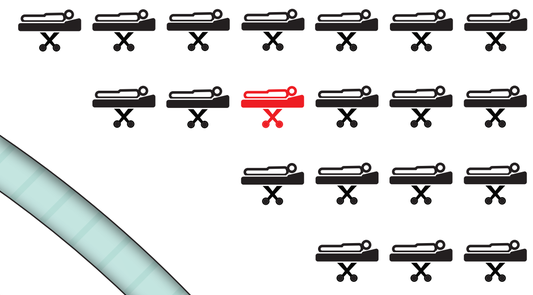
Appendix R. Infographic Poster on CAUTI Prevention

The poster on the following page is intended to be printed with dimensions of 28 by 36 inches. This can be done by sending the PDF out to a printer for large-format printing, or by printing it in tiled sections. Print the poster in tiled pieces by selecting “Poster” in the “Page Sizing & Handling” section of the Adobe Acrobat Reader print dialog box.

Healthcare-associated infections (HAIs) are a significant cause of illness, death, and excess cost in all health care settings.

Catheter-associated urinary tract infections (CAUTI) are among the most common HAIs in the United States.

At any given time, HAIs affect 1 out of every 20 hospital patients.



CAUTI Prevention Steps

Proper Insertion and Maintenance Intervention

Insertion

Aseptic technique is required during the insertion of a urinary catheter.

Staff responsible for the insertion of urinary catheters should have instruction on this procedure and their competency validated prior to independent insertions.

If necessary to maintain aseptic technique, a second staff member may be needed to assist the person doing the insertion.

When inserting urinary catheters for patients who will require close urine output monitoring (e.g., ED/OR/ICUpatients), use urinary drainage systems with urometers at the time of insertion.

Securement

Ensure the catheter remains securely attached to the closed drainage system, and minimize breaking into the connection.

Maintain an independent loop; ensure that there are not loops in the catheter tubing that increase bladder pressure.

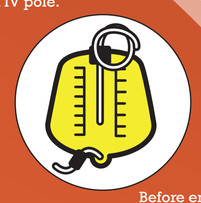
Catheters should be secured in a position that is comfortable for the patient and that will decrease movement and trauma to the urethra.

Drainage Bag

Maintain the bag at a level below the patient's bladder

The bag should never come into contact with the floor. Hang it on a hook below the patient's bladder. Hooks can be on the bed, a chair, a walker, or an IV pole.

Patients and families should be instructed not to empty the drainage bag or to move it above the level of the bladder.



Empty the bag regularly.

Empty it by draining the urine in the tubing into the bag and then emptying the bag before transport of the patient.

Before emptying the bag, perform hand hygiene and don gloves.

Empty the bag regularly via the drainage spigot, and empty it carefully to avoid any splashing.

The spigot should not come into contact with the nonsterile urine collection container.

Before handling another patient's urinary drainage bag, remove gloves, perform hand hygiene, and don a pair of clean gloves to work with the new patient's equipment.

Hygiene

Do not change catheters unnecessarily or as part of a routine practice.

Daily personal hygiene should be managed using soap and water and may be needed more frequently if the patient has diarrhea.

Appropriate Catheter Use

Alternatives

Consider using urine output collection and measurement systems other than catheters, including:

Condom catheters for male patients.

Urinals for both female and male patients.

Bedpans or bedside commodes.

Frequent toileting on a schedule to assist patients with urine output in the bathroom using a "hat" plastic urine measurement device in the toilet.

Use of super-absorbent pads that wick away urine, thereby keeping the patient's skin dry to prevent breakdown.

Daily weighing of patients to provide data about fluid status changes per day.

Indications

Use a urinary catheter only when indicated based on the HICPAC/CDC Guideline:

Accurate measurement of urinary output in critically ill patients

Perioperative use in selected surgeries

Assistance in healing of perineal and sacral wounds in incontinent patients

Acute urinary retention or obstruction

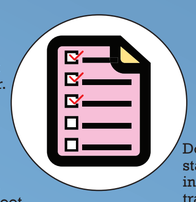
Hospice, comfort, or palliative care

Required strict immobilization for trauma or surgery

Chronic indwelling urinary catheter on admission

Review for Need

On daily physician rounds, staff should inform the physician that the patient has a catheter.



Once per shift, document the ongoing need for the catheter based on an indication approved by the Centers for Disease Control and Prevention.

Document the ongoing need, stating the indication for an indwelling urinary catheter on transfer paperwork so that caregivers will know the indication.

At shift change, discuss the patient's need for the catheter. Does the patient continue to meet an appropriate indication?

If the patient no longer needs the catheter, follow your hospital's policy to have it removed.

Families

Engage patients and their families in decision making about catheters.

Educate patients and families about the need for the catheter based on indication.

Encourage family members to ask physicians daily about the catheter's necessity.

Remove the catheter as soon as it is no longer needed!

Prompt Removal Intervention

By taking these steps, your hospital can eliminate CAUTI and make care safer for patients.

Your unit team can make sure the steps are done consistently through audits, observations, and assessments.

AHRQ Safety Program for Reducing CAUTI in Hospitals

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Appendix S. Intensive Care Unit Infographic Poster

Stop catheter-associated urinary tract infections (CAUTI) in critically ill patients.

1. RAISE AWARENESS AND UNDERSTAND THE RISKS OF INDWELLING URINARY CATHETERS

Possible misconceptions:

"It's just a Foley, so what's the big deal?"

"All immobile intensive care unit patients need Foley catheters."

"Incontinent patients need a urinary catheter to prevent hospital-acquired pressure ulcers."

"CAUTI prevention isn't my responsibility."

"My team needs precise fluid intake and output details for our patients throughout their ICU stay."

What the science & evidence show:

CAUTI is a serious patient safety issue.[1]

- Complications associated with CAUTI result in increased length of stay, patient discomfort, excess health care costs, and even death.
- It's about more than just the Foley. Unnecessary catheterization puts patients at risk for urinary tract infections and may cause other complications such as multidrug-resistant organisms, additional antibiotics leading to increased risk of *Clostridium difficile* infection, immobility (Foley is considered a "one-point restraint"), hospital-acquired pressure ulcers, falls, and venous thromboembolism.[2,3]
- Not all critically ill, immobile patients need Foley catheters.
- All team members—from frontline staff to leaders—have a responsibility to help prevent CAUTI.
- CAUTI prevention is also tied to the "bottom line" with potential financial implications associated with Centers for Medicare & Medicaid Services and healthcare-acquired conditions, value based purchasing, and population health.
- CAUTI outcome measures are used to assess performance.

2. CONSIDER ALTERNATIVES FOR MEASURING FLUID INTAKE AND OUTPUT

Daily weights

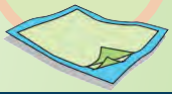
Condom catheter

Female and male urinals

Straight intermittent catheterization

Patient commodes

Absorbent briefs or under pads that can be weighed to obtain urine output



3. RETHINK THE "CULTURE OF CULTURING" URINE

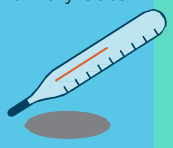
Reflex pan culturing may lead to *C. difficile* infection.

Asymptomatic bacteriuria + ***exposure to unnecessary antibiotics***

possible *C. difficile* infection

If a patient develops a new fever, "...(> 38.3 C), it is a reasonable trigger for a clinical assessment but not necessarily a laboratory or radiologic evaluation for infection." [4]

Don't assume an ICU patient's fever is due to a urinary tract infection...



...Other causes could include: [4]

- Respiratory tract infection
- Gastrointestinal infection
- Bloodstream infection
- Neurological pathology that may result in altered thermoregulation

"Critical care units could reduce the cost of fever evaluations by eliminating automatic laboratory and radiologic tests for patients with new temperature elevation (level 2). Instead, these tests should be ordered based on clinical assessment."[4]

4. TACKLE CAUTI

1. Pause and verify that the patient has an approved indication before inserting catheter.
2. Involve a second person during insertion to facilitate aseptic technique.
3. Evaluate continued need daily.
4. Empower nursing staff to discontinue catheter use as soon as possible.

Make a difference. Change the culture. Visit www.ahrq.gov/CAUTItools for more information.

1. Bell L. AACN Practice Alert: Catheter-Associated Urinary Tract Infections. November 2011.

2. Saint S, Savel RH, Matthay MA. Enhancing the Safety of Critically Ill Patients by Reducing Urinary and Central Venous Catheter-related Infections. Am J Resp Crit Care Med. 2002;165:1475-9. PMID: 12045119.

3. Fakih MG, Krein SL, Edson B, et.al. Engaging health care workers to prevent catheter-associated urinary tract infection and avert patient harm. Am J Infect Control. 2014 Oct;42(10 Supple):S223-9. PMID: 25239714.

4. O'Grady NP, Barie PS, Bartlett JG, et al. Guidelines for evaluation of new fever in critically ill adult patients: 2008 update from the American College of Critical Care Medicine and the Infectious Diseases Society of America. Crit Care Med. 2008 Apr; 36(4):1330-1349. PMID: 18379262.

AHRQ Agency for Healthcare Research and Quality

APIC Association for Professionals in Infection Control and Epidemiology

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September 2015

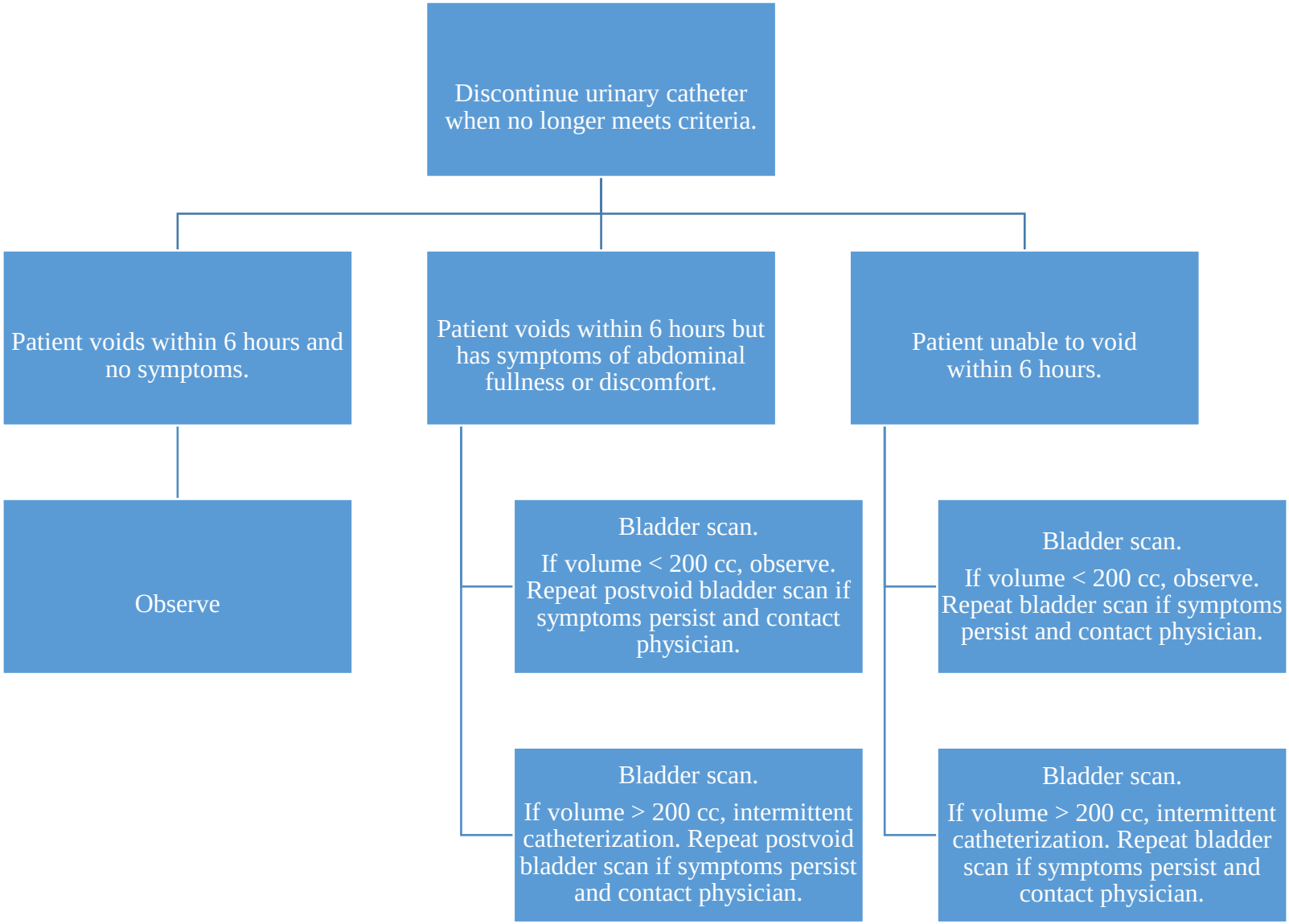
Appendix T. Example of a Nurse-Driven Protocol for Catheter Removal

Below is an example of a nurse-driven protocol to evaluate and discontinue unnecessary urinary catheters and to evaluate urinary needs after catheter removal. This protocol uses an algorithm for assessment, and no physician order is required. It is an example that can be used to determine the best practices for your hospital's patient population via discussion with your institution's medical care providers

The nurse should assess the patient each morning for the presence of a urinary catheter and the continued need using the following steps:

1. Does the patient have a urinary catheter? If no, reevaluate the next day. If yes, evaluate for need.
2. Catheter need: The catheter is acceptable for any (at least one) of the following reasons below:
    - Urinary retention including obstruction and neurogenic bladder: The patient is unable to pass urine because of an enlarged prostate, blood clots, or an edematous scrotum/penis, or is unable to empty the bladder because of neurologic disease/medication effect.
    - Short perioperative use in selected surgeries (less than 24 hours) and for urologic studies or surgery on contiguous structures.
    - Placed by urology service (check plan with urology service).
    - Required highly accurate output measurements in the intensive care units (e.g. hourly measurement).
    - Assist healing of severe perineal and sacral wounds in incontinent patients to avoid further deterioration of wound and skin.
    - Required strict immobilization for trauma or surgery.
    - Hospice/comfort care or palliative care, if requested by patient.
3. If no appropriate (acceptable) indication(s) for use are present, the nurse should discontinue the urinary catheter.
4. Post discontinuation, observe the patient based on the attached algorithm.
5. Contact physician with any concerns related to assessment of the patient.

Algorithm for observing patient after discontinuing urinary catheter



Appendix U. Skin Care in the Incontinent Patient

An indwelling urinary catheter is *not* the answer for urinary incontinence.

- Good skin care technique will prevent skin breakdown.
  - Use perineal cleansing products as needed.
  - Avoid use of agents containing alcohol as they are too drying to the skin.
  - Use moisture barrier cream and/or a barrier wipe.
  - Turn patient every 2 hours.
  - Modify environment to be conducive to maintaining independence with continence (e.g., bedside commode or urinal within reach if appropriate).

- Minimize contact of urine to skin.
  - Use only one quilted cloth pad for incontinence.
  - Eliminate use of plastic-backed pads.
  - Promptly clean urine-soaked linens and gowns.

- Develop a toileting program.
  - Answer call lights promptly
  - Offer bed pan every 2 hours—no exceptions!

You may want to include techniques and/or products that are in accordance with your facility's wound care protocol.

Appendix V. CAUTI Event Report Template

When a catheter-associated urinary tract infection (CAUTI) occurs on your unit, teams can use this tool, adapted from a report developed by the North Carolina Quality Center, to identify root causes.

Patient	Medical Record Number	Admit Date

Diagnosis	Did the patient have diarrhea while the urinary catheter was present?	Infection Date and Criteria

Patient's Location/Room No(s) and Occupancy Dates	Microorganism(s) Cultured Out	Credentials of Person Inserting Urinary Catheter
		RN MD PA/NP APRN NA Other:

No.	Question	Response
1	**Urinary catheter (UC) insertion (date, type, where inserted). Include all reinsertion information.**	
2	**Date UC removed**	
3	**Length of time UC was in (days):**	
4	**Number of days between UC insertion and first symptoms of a UTI:**	
5	Was there a physician order for the Foley?	Yes: _____ No: _____ If no, please explain:
6	Were alternatives to UC considered and documented?	Yes: _____ No: _____ If no, please explain why:
7	If the patient experienced urinary retention, was the bladder scanning protocol followed prior to UC insertion/reinsertion?	Yes: _____ No: _____ NA: _____ If no, please explain why:
8	Did patient meet insertion criteria?	Yes: _____ No: _____ If no, please explain why UC inserted:
9	Was catheter secured per hospital policy?	Yes: _____ No: _____ If no, please explain why:
10	Was patient assessed daily for ongoing need for catheter, and did patient meet criteria to keep it in?	Yes: _____ No: _____ If no, please explain why:

No.	Question	Response
11	Was the UC drainage system opened at any point during duration of catheterization?	Yes: _____ No: _____ If yes, please explain:
12	Did the person who inserted the UC have documented competency to insert a UC?	Yes: _____ No: _____ If no, please explain why:
13	Was the UC drainage bag kept below bladder level at all times?	Yes: _____ No: _____ If no, please explain why:
14	Were there any problems with the UC equipment or supplies?	Yes: _____ No: _____ If yes, please explain:
15	Was the patient transported between units/Radiology/OR/ED, etc.?	Yes: _____ No: _____ If yes, explain how Foley drainage bag was transported:
16	Can each staff member involved in this patient's care verbalize correct strategies to prevent CAUTI?	Yes: _____ No: _____ If no, please explain:
17	Was the patient and/or family engaged in preventing CAUTI? (Did they receive education on the Foley and things they could do to prevent infection?)	Yes: _____ No: _____ If no, please explain:
18	Are there any significant patient factors that may have contributed to this infection?	Yes: _____ No: _____ If no, please explain:
19	Did workload impact the provision of care?	Yes: _____ No: _____ If yes, please explain:
20	Is the presence of a urinary catheter and date of insertion included on all transfer/shift report checklists/protocols?	Yes: _____ No: _____ If no, please explain:
21	Is there a standard sterile insertion tray available for use that contains a closed drainage system?	Yes: _____ No: _____ If no, please explain why:
22	What is hand hygiene compliance like for the units in which the patient stayed?	
23	Does each patient have an individual, clean container in which to empty the UC collection bag?	Yes: _____ No: _____ If no, please explain why:
24	Is there a nurse-driven protocol to promote catheter removal?	Yes: _____ No: _____ If no, please explain why:
25	If there is not a nurse-driven protocol to promote catheter removal, is there a standard daily reminder to the physician that the catheter is still in?	Yes: _____ No: _____ If no, please explain:
26	From the information collected, do you think this CAUTI was potentially avoidable?	Yes: _____ No: _____ Please explain response:

Appendix W. Interpreting CAUTI Data Trends

Use these tables to evaluate your data submission rates and outcome data results by comparing your rates to the tables.

CAUTI DATA SUBMISSION: Look at both outcome and process data submission rates			
	Outcome Data Submission	**Process Data Submission**	**Suggested Actions/Questions To Consider**
	At least 80% and same or better than last month	At least 60% and same or better than last month	Congratulate team; continue current work/data review
	At least 80% and same or better than last month	Less than 60% OR worse than last month	Does team understand the rounding process? Have they designated a lead person for rounding? Any barriers to data submission?
	Less than 80% OR worse than last month	At least 60% and same or better than last month	Is team working with their Infection Control department to obtain this data? Any barriers to data submission?
	Less than 80% OR worse than last month	Less than 60% OR worse than last month	Does team intend to actively participate? Review all the above actions with them; What are their barriers?

CAUTI DATA REVIEW: Look at 3 Parameters: CAUTI Rates, Percent of Patients with at least one appropriate indication, and Outcome Prevalence. Use one of the two tables below.			
If CAUTI Rates are DECREASING (Favorable Trend): Look at % of Patients with Appropriate Indication and Outcome Prevalence and use this table:			
CAUTI Rate	**% with Approp Indication**	**Prevalence** (outcome data)	**Suggested Actions/Questions To Consider**
Favorable (decreasing)	Favorable (increasing)	Favorable (decreasing)	Congratulate team; continue current work/data review
Favorable (decreasing)	Favorable (increasing)	Unfavorable (increasing)	Has case mix changed so more patients appropriately need catheters? Is unit doing daily rounding for removal?
Favorable (decreasing)	Unfavorable (decreasing)	Favorable (decreasing)	Revisit staff education re: appropriate HICPAC indications
Favorable (decreasing)	Unfavorable (decreasing)	Unfavorable (increasing)	Revisit staff education re: appropriate HICPAC indications; Is unit doing daily rounding for removal?

If CAUTI Rates are INCREASING (Unfavorable Trend): Look at % of Patients with Appropriate Indication and Outcome Prevalence and use this table:			
CAUTI Rate	**% with Approp Indication**	**Prevalence** (outcome data)	**Suggested Actions/Questions To Consider**
Unfavorable (increasing)	Favorable (increasing)	Favorable (decreasing)	Is rate up due to smaller denominator (catheter days)? Are there catheter insertion or care/maintenance issues?
Unfavorable (increasing)	Favorable (increasing)	Unfavorable (increasing)	Are there catheter insertion or care/maintenance issues? Is unit rounding daily for removal?
Unfavorable (increasing)	Unfavorable (decreasing)	Favorable (decreasing)	Are there catheter insertion or care/maintenance issues? Revisit staff education re: appropriate indications
Unfavorable (increasing)	Unfavorable (decreasing)	Unfavorable (increasing)	Are there catheter insertion or care/maintenance issues? Revisit staff education re: appropriate indications; Is unit rounding daily for catheter removal?

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Criterion	**Symptomatic Urinary Tract Infection (SUTI)** Must meet at least 1 of the following criteria:
1a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms.
1b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
2a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 or ≥3 WBC/high power

	field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
2b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
3	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
4	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urinalysis demonstrated by at least one of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 or ≥3 WBC/high power field of unspun urine) c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of between $\geq 10^3$ and $<10^5$ CFU/ml with no more than two species of microorganisms.
Criterion	**Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**
	Patient with or without an indwelling urinary catheter has no signs or symptoms (i.e., for any age patient, no fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, or for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting) *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms* *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture. ***** Fever is not diagnostic for UTI in the elderly (> 65 years of age) and therefore fever in this age group does not disqualify from meeting the criteria of an ABUTI. * For ABUTI, report only isolate(s) in both blood and urine specimens. * Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*,and

	Corynebacterium (urease positive).
Comments	• Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection. • Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports. • In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration. • Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours. • Urine specimen labels should indicate whether or not the patient is symptomatic. • Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI). • Report only pathogens in both blood and urine specimens for ABUTI. • Report *Corynebacterium* (urease positive) as either *Corynebacterium* species unspecified (COS) or, as *C. urealyticum* (CORUR) if so speciated.
Criterion	**Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)** Other infections of the urinary tract must meet at least 1 of the following criteria:
1	Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site.
2	Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination.
3	Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
4	Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
Comment	• Report infections following circumcision in newborns as SST-CIRC.

Catheter-Associated Urinary Tract Infection (CAUTI) Event

Introduction: The urinary tract is the most common site of healthcare-associated infection, accounting for more than 30% of infections reported by acute care hospitals[1]. Virtually all healthcare- associated urinary tract infections (UTIs) are caused by instrumentation of the urinary tract.

CAUTI can lead to such complications as cystitis, pyelonephritis, gram-negative bacteremia, prostatitis, epididymitis, and orchitis in males and, less commonly, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis in all patients. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality. Each year, more than 13,000 deaths are associated with UTIs.[1]

Prevention of CAUTIs is discussed in the CDC/HICPAC document, *Guideline for Prevention of Catheter-associated Urinary Tract Infections*[2].

Settings: Surveillance will occur in any inpatient locations where denominator data can be collected, which may include critical intensive care units (ICU), specialty care areas (SCA), stepdown units, and long term care wards. Neonatal units are NOT included. A complete listing of inpatient locations can be found in Chapter 15.

NOTE: It is not required to monitor for CAUTIs after the patient is discharged from the facility, however, if discovered, they should be reported to NHSN. No additional indwelling catheter days are reported.

Requirements: Surveillance for CAUTI is performed in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: As for all infections reported to NHSN, infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection area not considered healthcare associated. Therefore, infections that become apparent within the first few days of admission must be carefully reviewed to determine whether they should be considered healthcare associated.

Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria (Table 1 and Figure 1). Report UTIs that are catheter-associated (i.e. patient had an indwelling urinary catheter at the time of or within 48 hours before onset of the event).

NOTES:

1. There is no minimum period of time that the catheter must be in place in order for the UTI to be considered catheter-associated. EXAMPLE: Patient has a Foley catheter in place on an inpatient unit. It is discontinued, and 4 days later patient meets the criteria for a UTI. This is not reported as a CAUTI because the time since Foley discontinuation exceeds 48 hours.
2. SUTI 1b and 2b and other UTI (OUTI) cannot be catheter-associated.

Location of attribution: The location where the patient was assigned on the date of the UTI event, which is further defined as the date when the first clinical evidence appeared or the date the specimen use to meet the criterion was collected, whichever came first. EXAMPLE: Patient who had no clinical signs or symptoms of UTI upon arrival to the Emergency Department, has a Foley catheter inserted there before being admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for UTI. This is reported to the NHSN as a CAUTI for the MICU, because the Emergency Department is not an inpatient location and no denominator data are collected there.

TRANSFER RULE EXCEPTION: If a CAUTI develops within 48 hours of transfer from one inpatient location to another in the same facility, or a new facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below.

- Patient with a Foley catheter in place in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the SICU.
- Patient is transferred to the medical ward from the MSICU after having the Foley catheter removed. Within 24 hours, patient meets criteria for a UTI. This is reported to NHSN as a CAUTI for the MSICU.
- Patient with a Foley catheter in place is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the CCU.
- EXAMPLE: Patient on the urology ward of Hospital A had the Foley catheter removed and is discharged home a few hours later. The ICP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a UTI. This CAUTI should be reported to NHSN for Hospital A and attributed to the urology ward.

Indwelling catheter: a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system; also called a Foley catheter; does not include straight in-and-out catheters.

Numerator Data: The *Urinary Tract Infection (UTI)* F*orm* (CDC 57.114) is used to collect and report each CAUTI that is identified during the month selected for surveillance. The *Instructions for Completion of Urinary Tract Infection Form* (Tables of Instructions, Tables 5 and 2a) includes brief instructions for collection and entry of

each data element on the form. The UTI form includes patient demographic information and information on whether or not an indwelling urinary catheter was present. Additional data include the specific criteria met for identifying the UTI, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

Denominator data: Device days and patient days are used for denominators (See Chapter 16 Key Terms). Indwelling urinary catheter days, which are the number of patients with an indwelling urinary catheter device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.117, and 57.118). When denominator data are available from electronic databases, these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts. These daily counts are summed and only the total for the month is entered into NHSN. Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored.

Data Analyses: The SIR is calculated by dividing the number of observed infections by the number of expected infections. The number of expected infections, in the context of statistical prediction, is calculated using CAUTI rates from a standard population during a baseline time period as reported in the NHSN Report.

NOTE: The SIR will be calculated only if the number of expected HAIs (numExp) is ≥ 1.

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the CAUTI SIR can be calculated for single locations, the measure also allows you to summarize your data by multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one CAUTI SIR adjusting for all locations reported. Similarly, you can obtain one CAUTI SIR for all specialty care areas in your facility.

The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of catheter days and multiplying the result by 1000. The Urinary Catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days. These calculations will be performed separately for the different types of ICUs, specialty care areas, and other locations in the institution, except for neonatal locations.

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[1]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2]Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA. Guideline for prevention of catheter-associated urinary tract infections 2009. Infect Control Hosp Epidemiol. 2010;31(4):319-26.

Table 1: Urinary Tract Infection Criteria

Criterion	Urinary Tract Infection (UTI)
	Symptomatic Urinary Tract Infection (SUTI) Must meet at least 1 of the following criteria
1a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms.
1b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
2a	Patient had an indwelling urinary catheter in place at the time of specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 of unspun urine or ≥3 WBC/high power field of spun urine)

Criterion	Urinary Tract Infection (UTI)
	c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 of unspun urine or ≥3 WBC/high power field of spun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
2b	Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urinalysis demonstrated by at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or ≥3 WBC/high power field of spun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms.
3	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting

Criterion	Urinary Tract Infection (UTI)
	and a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms.
4	Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* a positive urinalysis demonstrated by at least one of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or ≥3 WBC/high power field of spun urine) c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of between $\geq 10^3$ and $<10^5$ CFU/ml with no more than two species of microorganisms.
Criterion	**Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**
	Patient with or without an indwelling urinary catheter has no signs or symptoms (i.e., for any age patient, no fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, OR for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting) *and* a positive urine culture of $>10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms* *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture, or at least 2 matching blood cultures drawn on separate occasions if the matching pathogen is a common skin contaminant. * Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*,and *Corynebacterium* (urease positive).
Comments	• Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection. • Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports. • In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration.

Criterion	Urinary Tract Infection (UTI)
	• Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours. • Urine specimen labels should indicate whether or not the patient is symptomatic. • Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI). • Report only pathogens in both blood and urine specimens for ABUTI. • Report *Corynebacterium* (urease positive) as either *Corynebacterium* species unspecified (COS) or, as *C. urealyticum* (CORUR) if so speciated.
Criterion	**Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)**
	Other infections of the urinary tract must meet at least 1 of the following criteria:
1	Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site.
2	Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination.
3	Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
4	Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting *and* at least 1 of the following: a. purulent drainage from affected site b. microorganisms cultured from blood that are compatible with suspected site of infection c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]).
Comment	• Report infections following circumcision in newborns as SST-CIRC.

Figure 1: Identification and Categorization of SUTI Indwelling Catheter at the Time of Specimen Collection

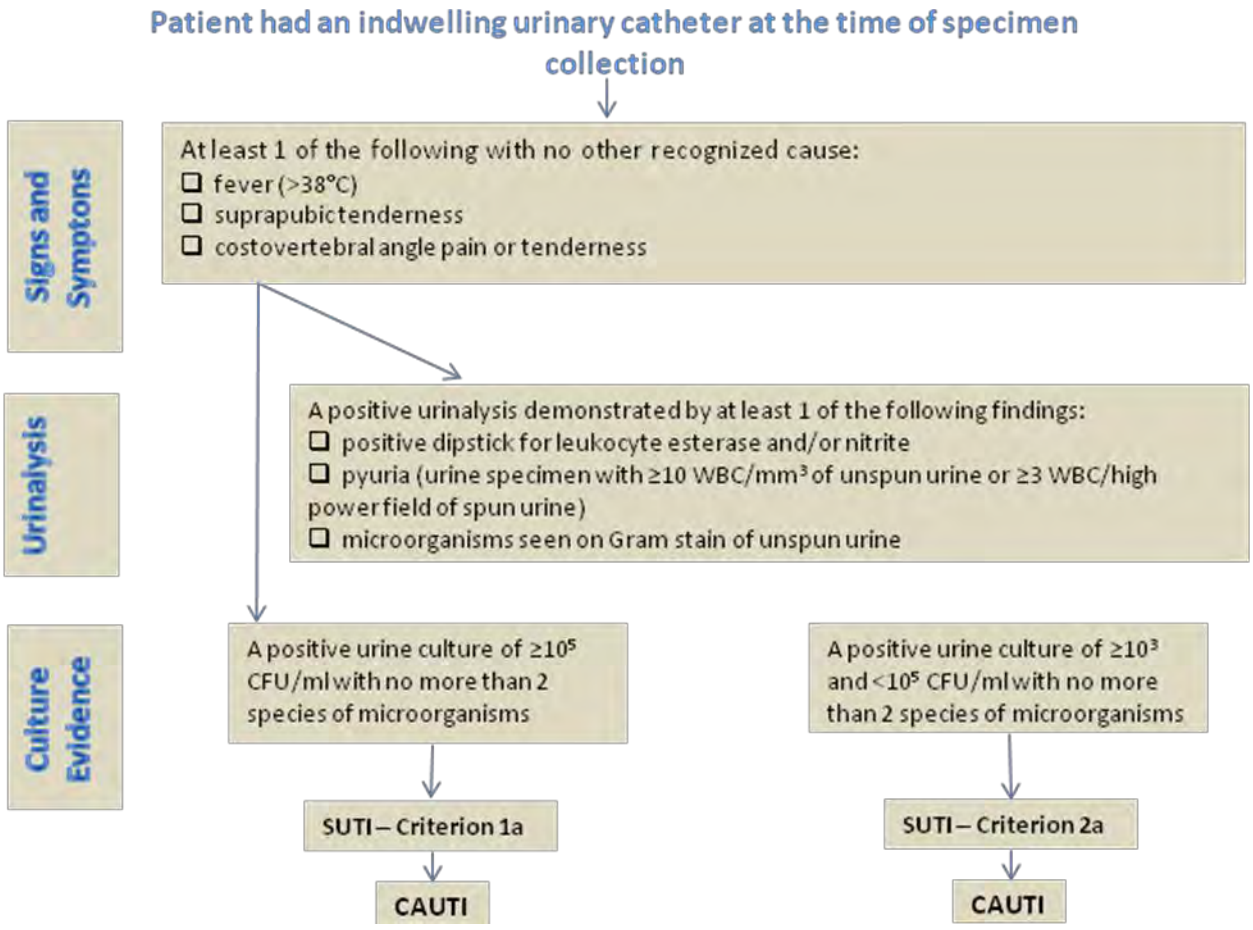


Figure 2: Identification and Categorization of SUTI Indwelling Catheter Discontinued in Prior 48 Hours

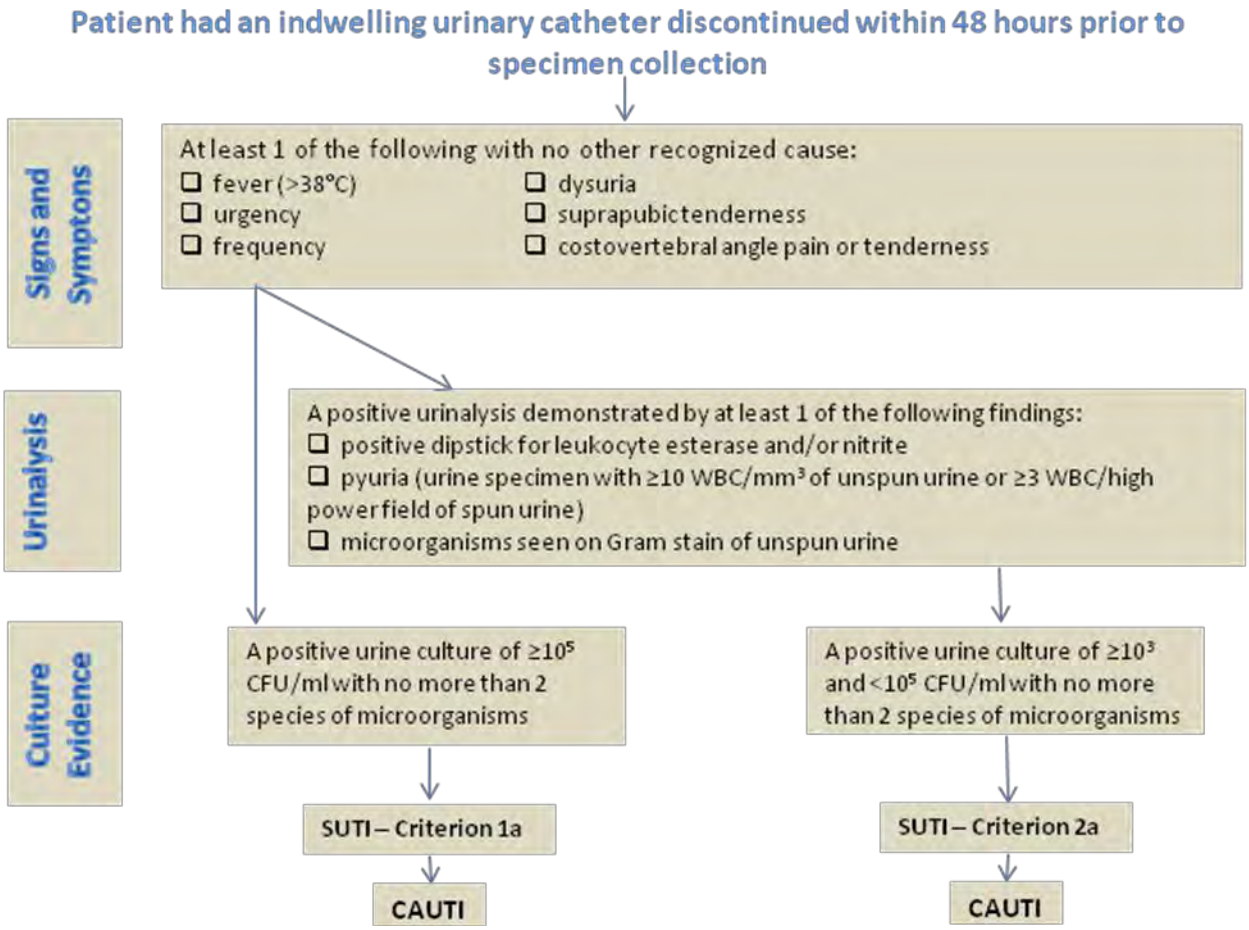


Figure 3: Identification and Categorization of SUTI Without Indwelling Catheter at Time of or Within 48 Hours Prior to Specimen Collection

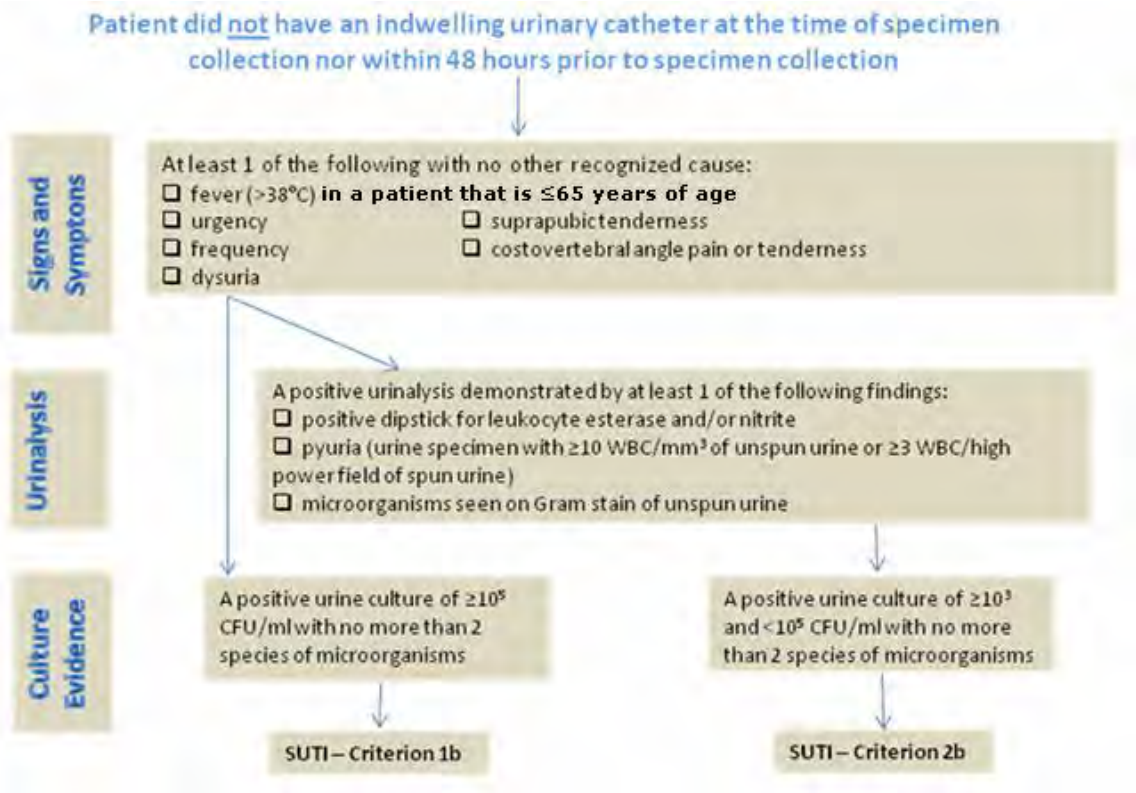


Figure 4: Identification and Categorization of SUTI in Patient ≤1 Year of Age

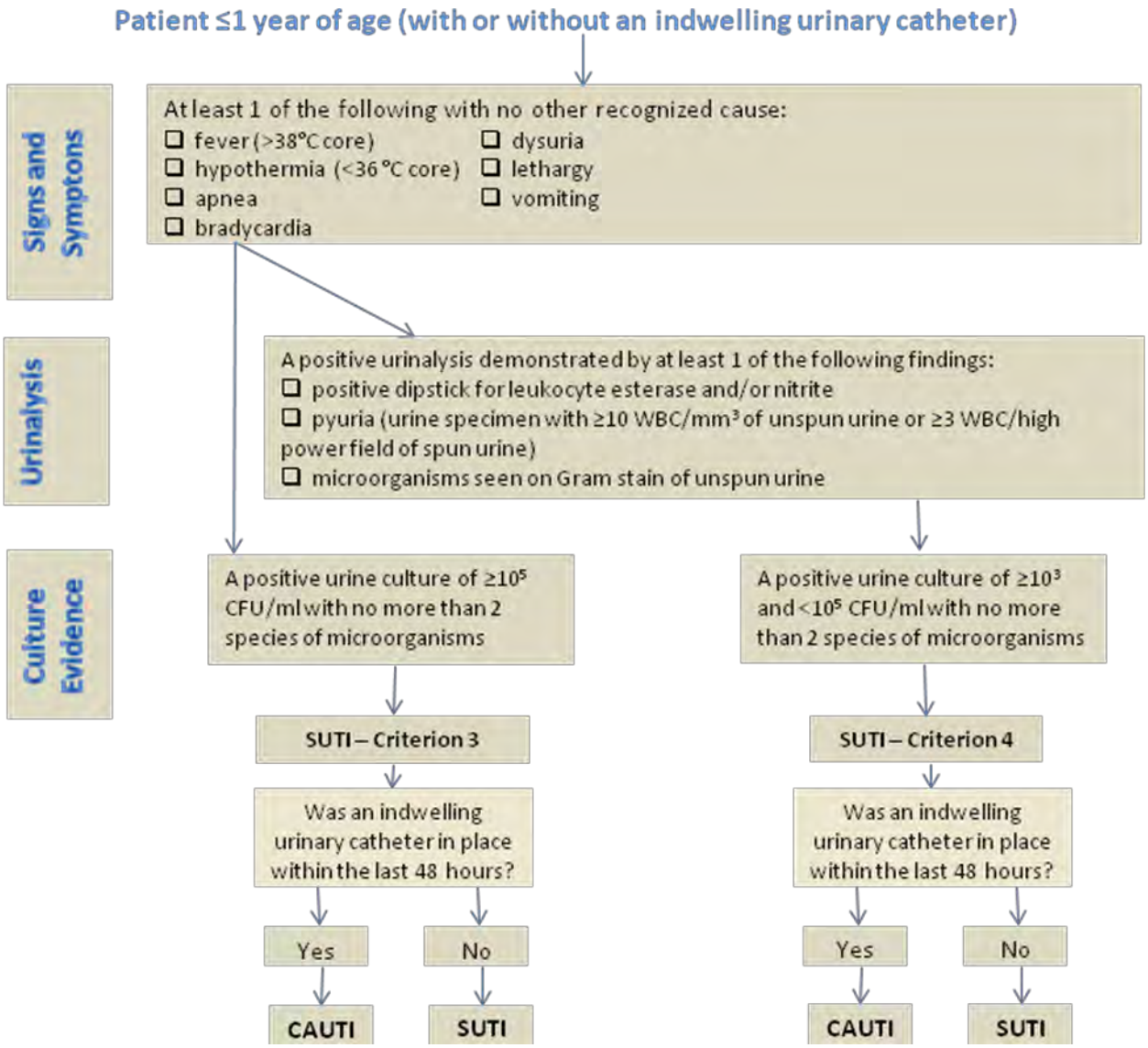
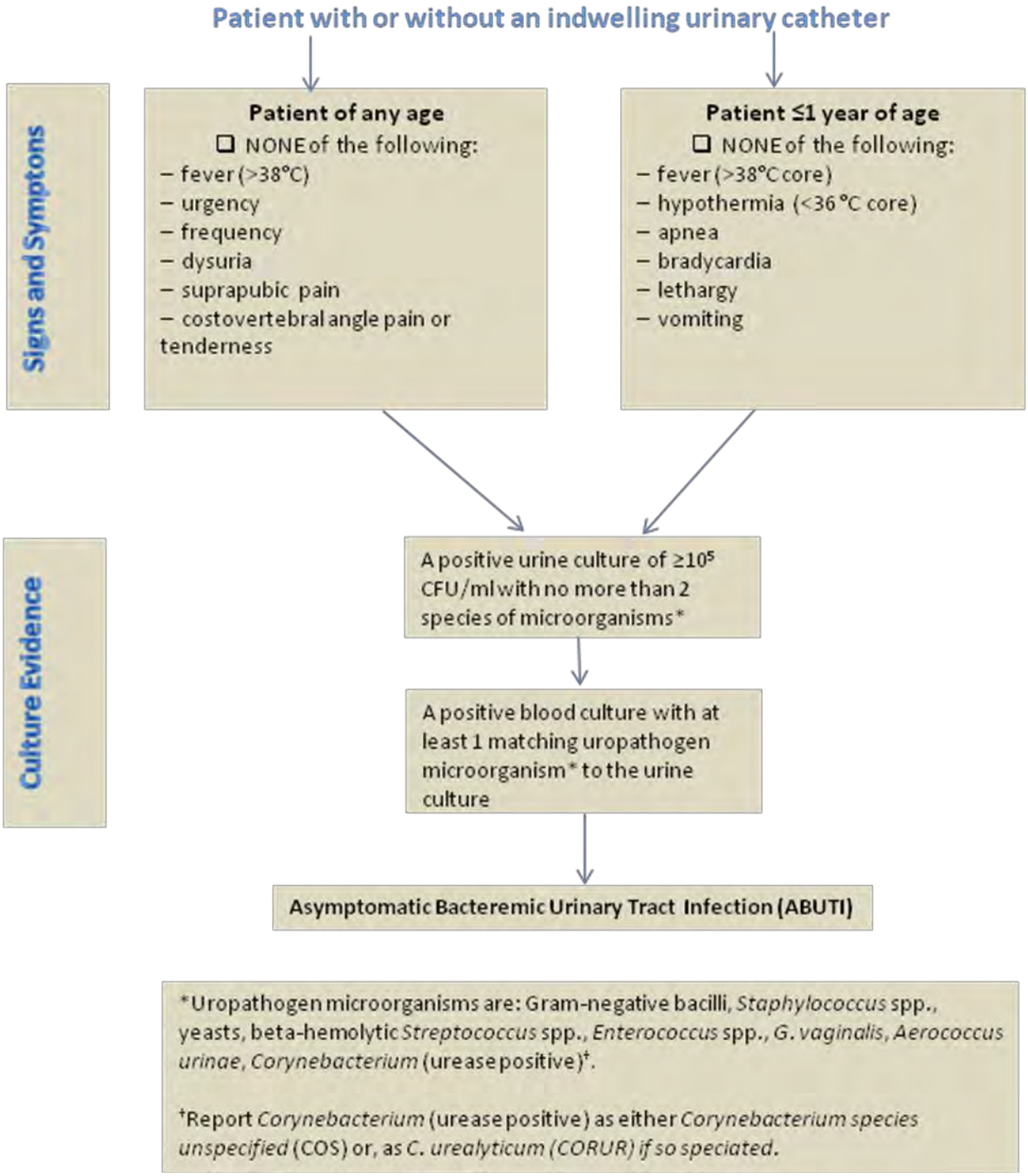


Figure 5: Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)



Catheter-Associated Urinary Tract Infection (CAUTI) Event

Introduction: The urinary tract is the most common site of healthcare-associated infection, accounting for more than 30% of infections reported by acute care hospitals[1]. Virtually all healthcare-associated urinary tract infections (UTIs) are caused by instrumentation of the urinary tract.

CAUTI can lead to such complications as cystitis, pyelonephritis, gram-negative bacteremia, prostatitis, epididymitis, and orchitis in males and, less commonly, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis in all patients. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality. Each year, more than 13,000 deaths are associated with UTIs.[1]

Prevention of CAUTIs is discussed in the CDC/HICPAC document, *Guideline for Prevention of Catheter-associated Urinary Tract Infections*[2].

Settings: Surveillance will occur in any inpatient locations where denominator data can be collected, which may include critical intensive care units (ICU), specialty care areas (SCA), step down units, and long term care wards. Neonatal ICUs are NOT included. A complete listing of inpatient locations can be found in Chapter 15.

NOTE: It is not required to monitor for CAUTIs after the patient is discharged from the facility. However, if discovered, any CAUTI occurring within 48 hours after discharge should be reported to NHSN. No additional indwelling catheter days are reported.

NOTE: Neonatal ICUs may participate but only off plan (not as a part of their monthly reporting plan).

Requirements: Surveillance for CAUTI is performed in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: As for all infections reported to NHSN, infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection area not considered healthcare associated. Therefore, infections that become apparent within the first few days of admission must be carefully reviewed to determine whether they should be considered healthcare associated.

Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria (Table 1 and Figure

1). Report UTIs that are catheter-associated (i.e. patient had an indwelling urinary catheter at the time of or within 48 hours before onset of the event).

NOTES:

1. There is no minimum period of time that the catheter must be in place in order for the UTI to be considered catheter-associated. EXAMPLE: Patient has a Foley catheter in place on an inpatient unit. It is discontinued, and 4 days later patient meets the criteria for a UTI. This is not reported as a CAUTI because the time since Foley discontinuation exceeds 48 hours.
2. SUTI 1b and 2b and other UTI (OUTI) cannot be catheter-associated.

Location of attribution: The location where the patient was assigned on the date of the UTI event, which is further defined as the date when the first clinical evidence appeared or the date the specimen use to meet the criterion was collected, whichever came first.

EXAMPLE: Patient, who had no clinical signs or symptoms of UTI upon arrival to the Emergency Department, has a Foley catheter inserted there before being admitted to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for UTI. This is reported to the NHSN as a CAUTI for the MICU because the Emergency Department is not an inpatient location and no denominator data are collected there.
EXCEPTION:
Transfer Rule: If a CAUTI develops within 48 hours of transfer from one inpatient location to another in the same facility, or a new facility, the infection is attributed to the transferring location. This is called the Transfer Rule and examples are shown below.

- Patient with a Foley catheter in place in the SICU is transferred to the surgical ward. Thirty six (36) hours later, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the SICU.
- Patient is transferred to the medical ward from the MSICU after having the Foley catheter removed. Within 24 hours, patient meets criteria for a UTI. This is reported to NHSN as a CAUTI for the MSICU.
- Patient with a Foley catheter in place is transferred from the medical ward to the coronary care ICU (CCU). After 4 days in the CCU, the patient meets the criteria for UTI. This is reported to NHSN as a CAUTI for the CCU.
- EXAMPLE: Patient on the urology ward of Hospital A had the Foley catheter removed and is discharged home a few hours later. The ICP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a UTI. This CAUTI should be reported to NHSN for Hospital A and attributed to the urology ward.

Indwelling catheter: a drainage tube that is inserted into the urinary bladder through the urethra is left in place, and it is connected to a closed collection system, e.g., not used for irrigation also called a Foley catheter, does not include straight in-and-out catheters.

Numerator Data: The *Urinary Tract Infection (UTI) Form* (CDC 57.114) is used to collect and report each CAUTI that is identified during the month selected for surveillance. The *Instructions for Completion of Urinary Tract Infection Form* (Tables of Instructions, Tables 5 and 2a) includes brief instructions for collection and entry of each data element on the form. The UTI form includes patient demographic information and information on whether or not an indwelling urinary catheter was present. Additional data include the specific criteria met for identifying the UTI, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

REPORTING INSTRUCTIONS:

- If no CAUTIs are identified during the month of surveillance, the Report No Events box must be checked on the appropriate denominator summary screen, e.g., Denominators for Intensive Care Unit (ICU)/other locations (Not NICU or SCA), etc.

Denominator Data: Device days and patient days are used for denominators (See Chapter 16 Key Terms). Indwelling urinary catheter days, which are the number of patients with an indwelling urinary catheter device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.117, and 57.118). When denominator data are available from electronic databases, these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts, validated for a minimum of 3 months. These daily counts are summed and only the total for the month is entered into NHSN. Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored.

Data Analyses: The SIR is calculated by dividing the number of observed infections by the number of expected infections. The number of expected infections, in the context of statistical prediction, is calculated using CAUTI rates from a standard population during a baseline time period as reported in the NHSN Report.

NOTE: The SIR will be calculated only if the number of expected HAIs (numExp) is ≥ 1.

$$SIR = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the CAUTI SIR can be calculated for single locations, the measure also allows you to summarize your data by multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one CAUTI SIR adjusting for all locations reported. Similarly, you can obtain one CAUTI SIR for all specialty care areas in your facility.

The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of catheter days and multiplying the result by 1000. The Urinary Catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days. These calculations will be performed separately for the different types of ICUs, specialty care areas, and other locations in the institution, except for neonatal locations.

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[1] Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[2] Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA. Guideline for prevention of catheter-associated urinary tract infections 2009. Infect Control Hosp Epidemiol. 2010;31(4):319-26.

Table 1: Urinary Tract Infection Criteria

Criterion	Urinary Tract Infection (UTI)
	Symptomatic Urinary Tract Infection (SUTI) Must meet at least 1 of the following criteria
1a	Patient had an indwelling urinary catheter in place at the time of specimen collection or onset of signs or symptoms *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms (see Comments section below). ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection or onset of signs or symptoms *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms(see Comments section below). .
1b	Patient did not have an indwelling urinary catheter in place at the time of, or within 48 hours prior to, specimen collection or onset of signs or symptoms *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms(see Comments section below).
2a	Patient had an indwelling urinary catheter in place at the time of specimen collection or onset of signs or symptoms *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 of unspun urine or >5 WBC/high power field of spun urine) c. microorganisms seen on Gram stain of unspun urine

Criterion	Urinary Tract Infection (UTI)
	and a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms(see Comments section below). ----------OR---------- Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection or onset of signs or symptoms *and* at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 of unspun urine or >5 WBC/high power field of spun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms(see Comments section below).
2b	Patient did not have an indwelling urinary catheter in place at the time of, or within 48 hours prior to, specimen collection or onset of signs or symptoms *and* has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or >5 WBC/high power field of spun urine) c. microorganisms seen on Gram stain of unspun urine *and* a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms(see Comments section below).
3	Patient ≤1 year of age with* or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting

Criterion	Urinary Tract Infection (UTI)
	and a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms(see Comments section below). . *The indwelling urinary catheter was in place within 48 hours prior to specimen collection or onset of signs or symptoms.
4	Patient ≤1 year of age with* or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting *and* at least one of the following findings: b. positive dipstick for leukocyte esterase and/or nitrite c. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or >5 WBC/high power field of spun urine) d. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of between $\geq 10^3$ and $<10^5$ CFU/ml with no more than two species of microorganisms(see Comments section below). . *The indwelling urinary catheter was in place within 48 hours prior to specimen collection or onset of signs or symptoms.
Criterion	**Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**
	Patient with* or without an indwelling urinary catheter has no signs or symptoms (i.e., for any age patient, no fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, OR for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting) *and* a positive urine culture of $>10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms** (see Comments section below). *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture, or at least 2 matching blood cultures drawn on separate occasions if the matching pathogen is a common skin commensal. *The indwelling urinary catheter was in place within 48 hours prior to specimen collection. **Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, and *Corynebacterium* (urease positive)[+]. [+]Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified (COS)* or as *C. urealyticum* (CORUR) if so speciated.
Comments	• Laboratory cultures reported as "mixed flora" represent at least 2 species of organisms. Therefore an additional organism recovered from the same

Criterion	Urinary Tract Infection (UTI)
	culture, would represent > 2 species of microorganisms. Such a specimen cannot be used to meet the UTI criteria. • Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection. • Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports. • In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration. • Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours. • Urine specimen labels should indicate whether or not the patient is symptomatic. • Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI). • Report only pathogens in both blood and urine specimens for ABUTI. • Report *Corynebacterium* (urease positive) as either *Corynebacterium* species unspecified (COS) or as *C. urealyticum* (CORUR) if so speciated.

Figure 1: Identification and Categorization of SUTI with Indwelling Catheter (see comments section page 7-8 thru 7-9 for important details)

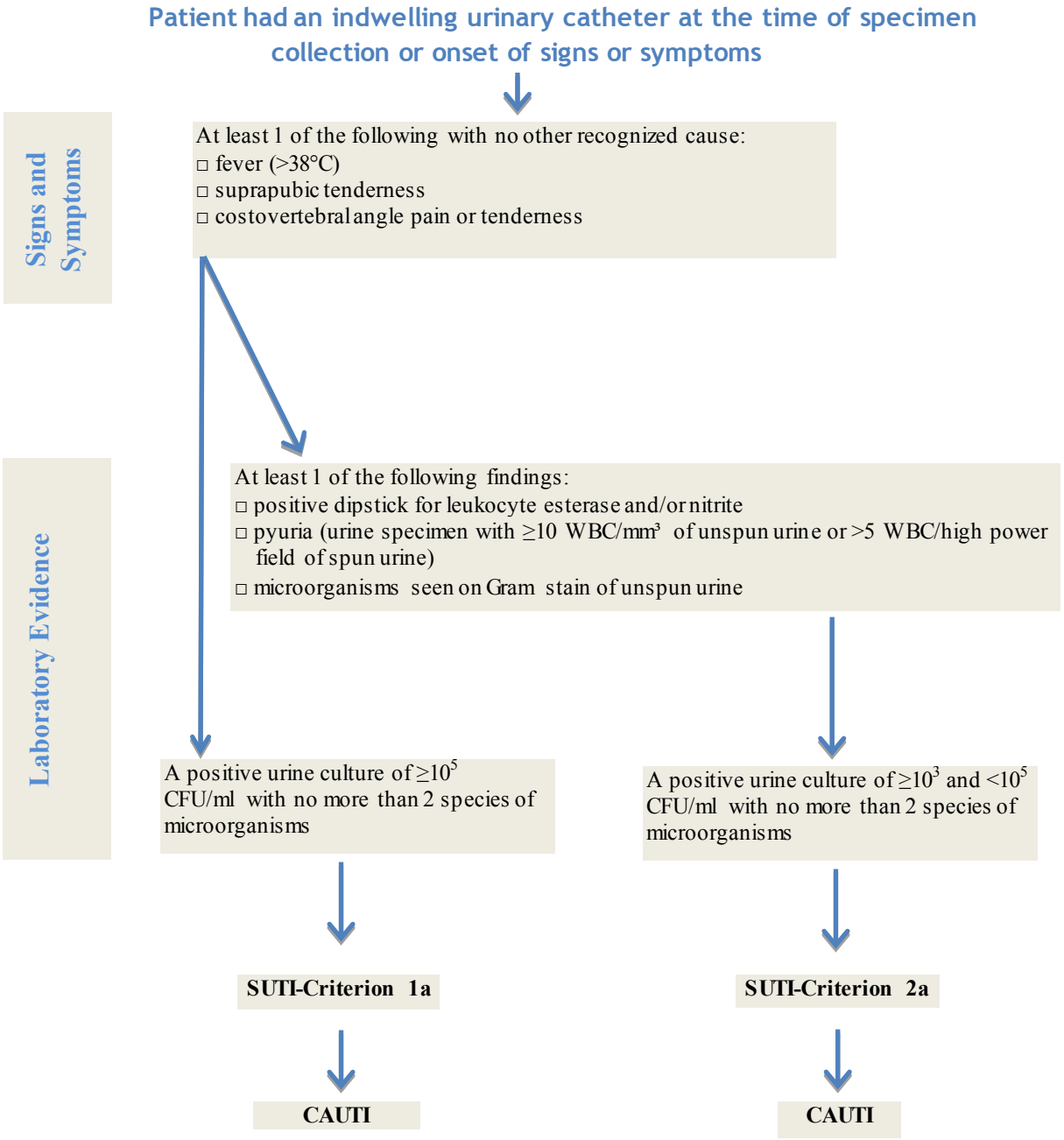


Figure 2: Identification and Categorization of SUTI Indwelling Catheter Discontinued in Prior 48 Hours (see comments section page 7-8 thru 7-9 for important details)

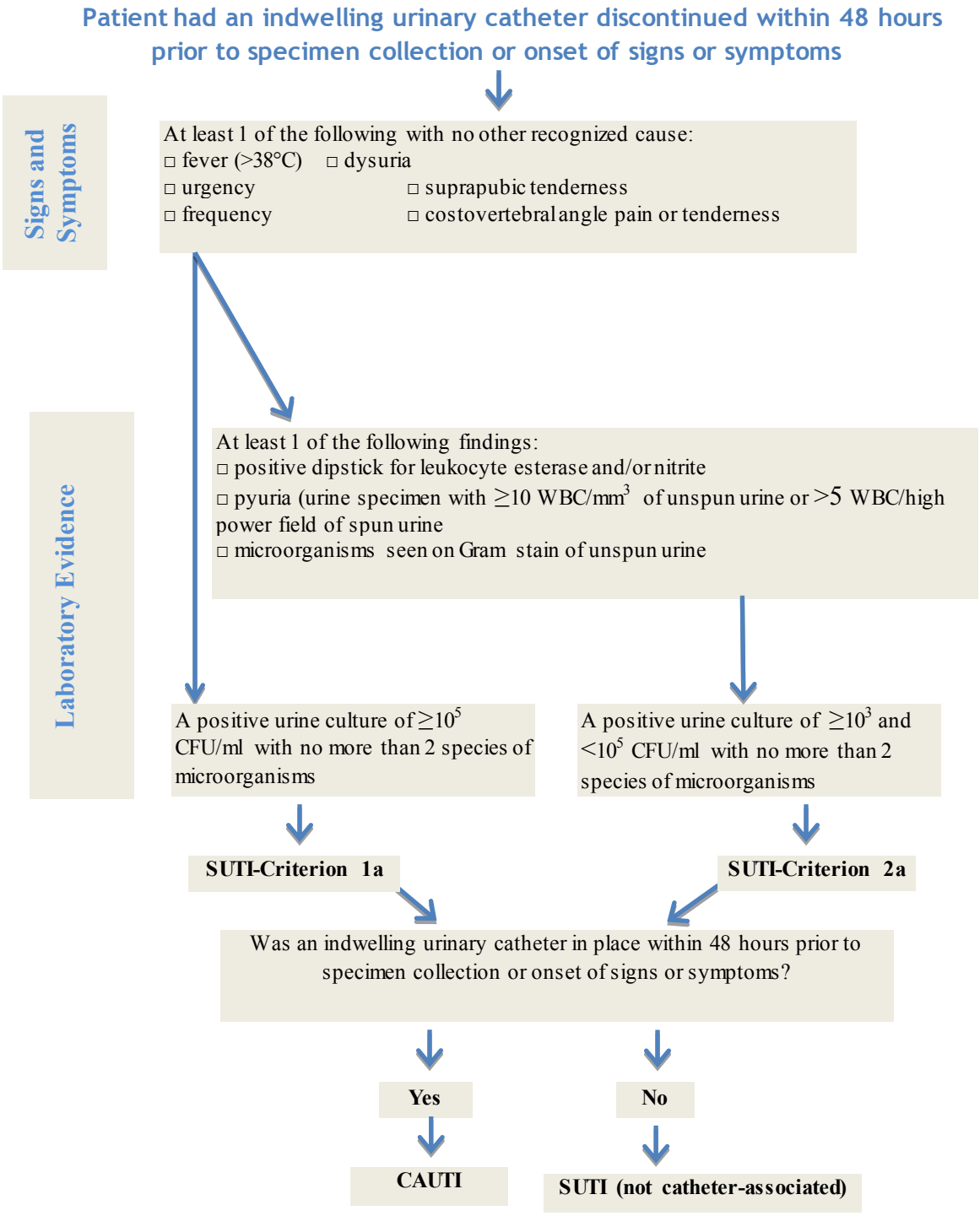


Figure 3: Identification and Categorization of SUTI without Indwelling Catheter (see comments section page 7-8 thru 7-9 for important details)

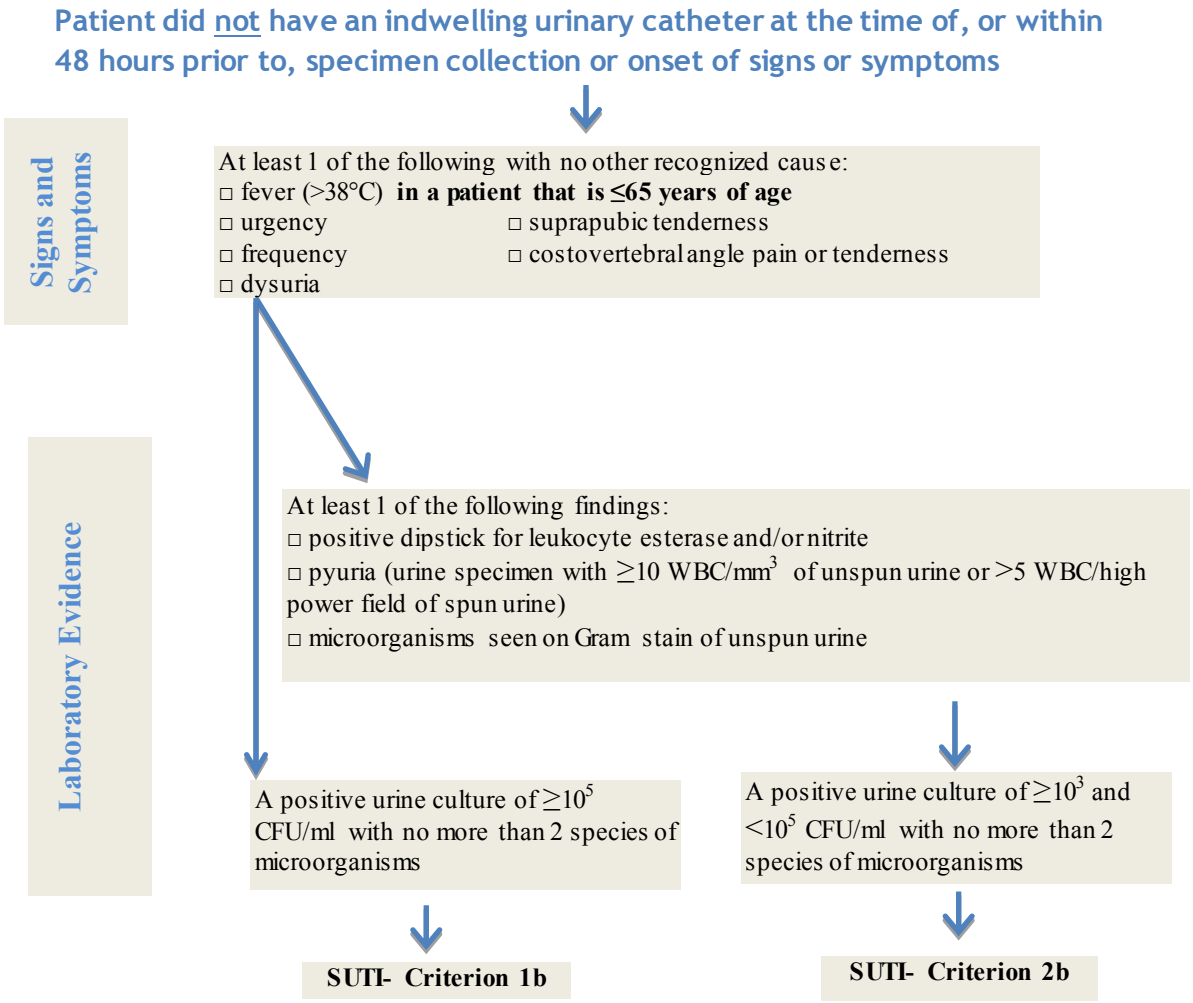
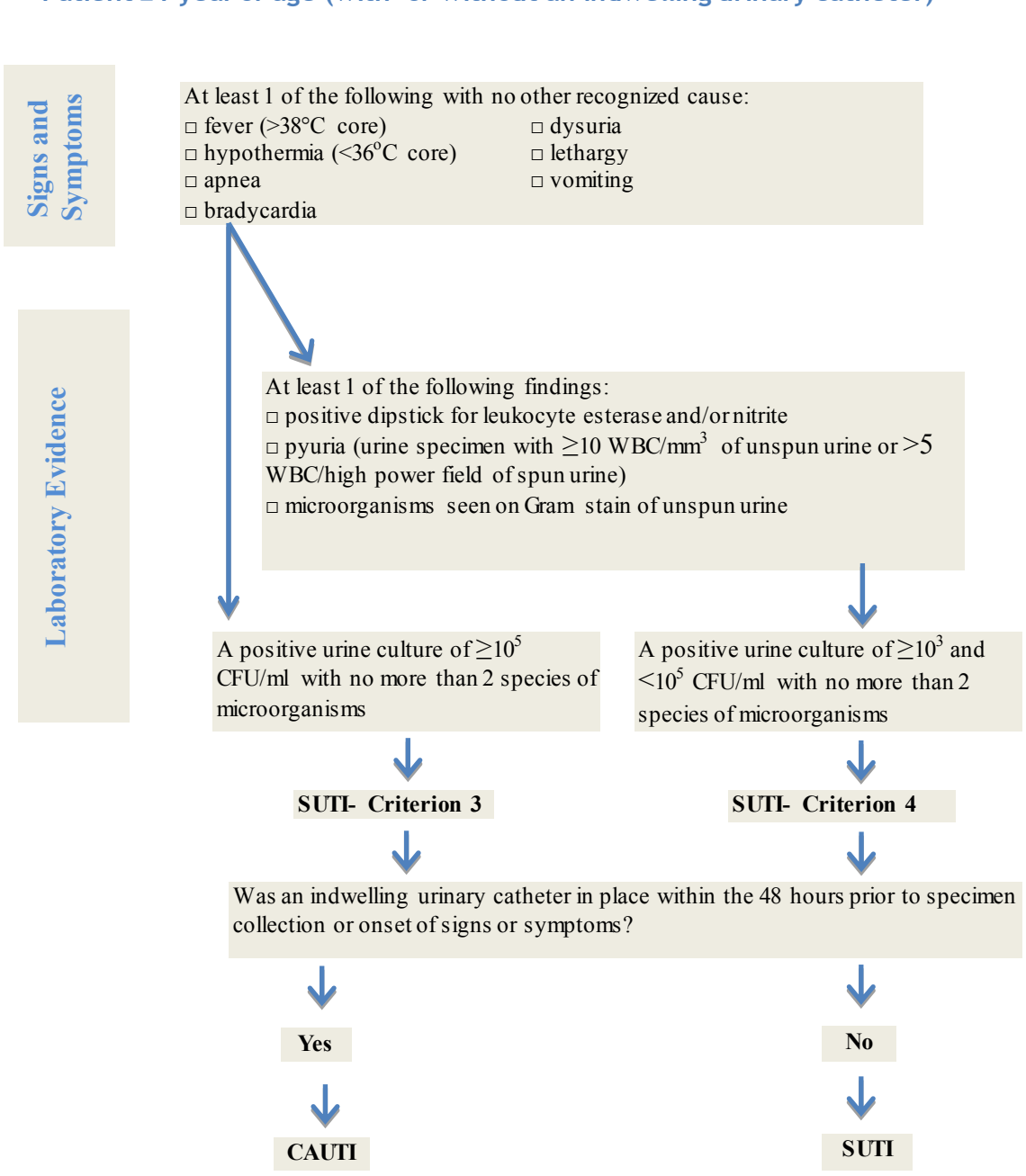
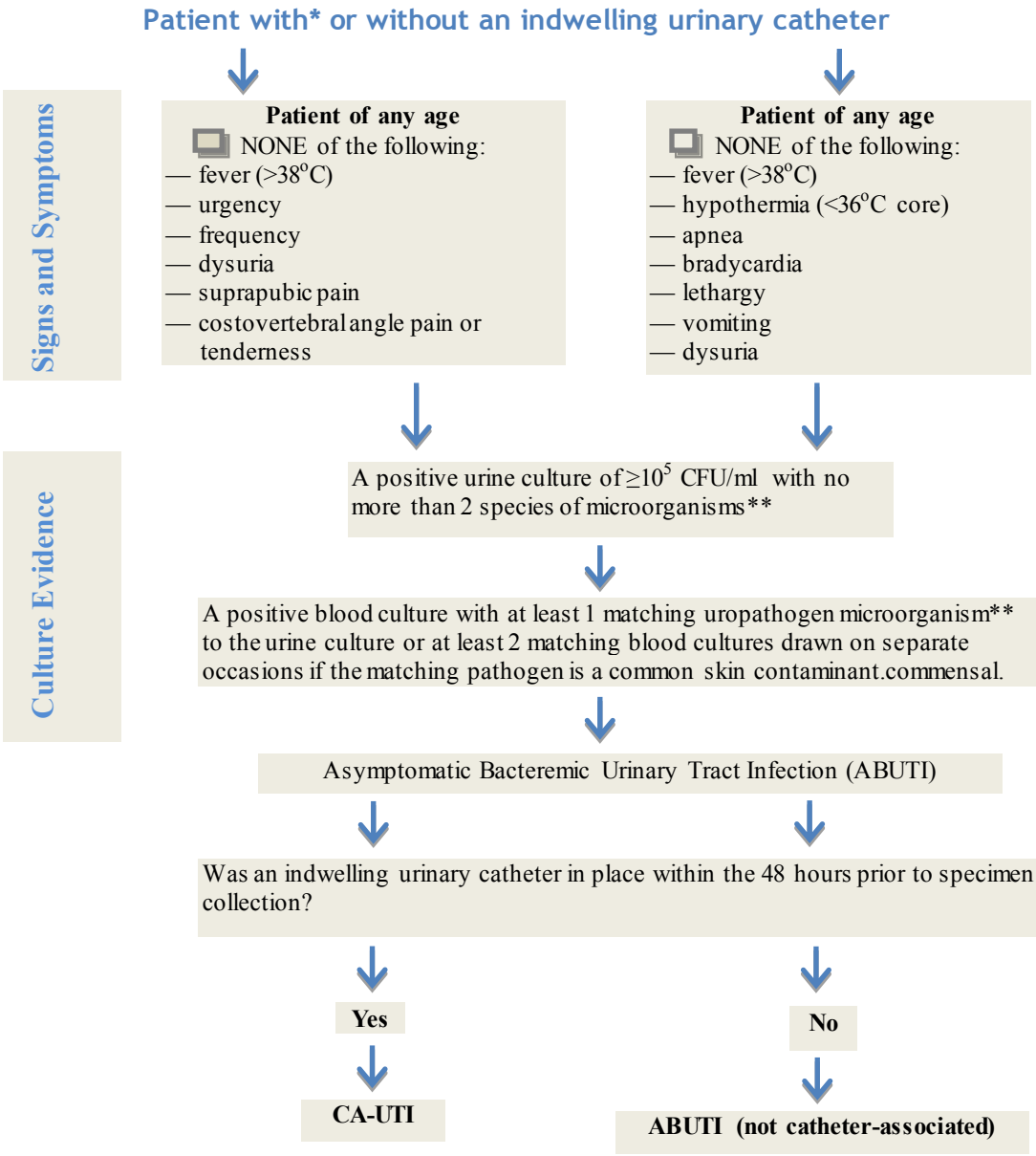


Figure 4: Identification and Categorization of SUTI in Patient ≤1 Year of Age(see comments section page 7-8 thru 7-9 for important details)



*The indwelling urinary catheter was in place within 48 hours prior to specimen collection or onset of signs or symptoms.

Figure 5: Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)



*The indwelling urinary catheter was in place within 48 hours prior to specimen collection s.

**Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, *Corynebacterium* (urease positive)[†].

[†]Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (COS) or as C. *urealyticum (CORUR) if so speciated*.

Catheter-Associated Urinary Tract Infection (CAUTI) Event

Introduction: Urinary tract infections (UTIs) are tied with pneumonia as the second most common type of healthcare-associated infection, second only to SSIs. UTIs account for more than 15% of infections reported by acute care hospitals[1]. Virtually all healthcare-associated UTIs are caused by instrumentation of the urinary tract.

CAUTI can lead to such complications as cystitis, pyelonephritis, gram-negative bacteremia, prostatitis, epididymitis, and orchitis in males and, less commonly, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis in all patients. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality[2]. Each year, more than 13,000 deaths are associated with UTIs.[3]

Prevention of CAUTIs is discussed in the CDC/HICPAC document, *Guideline for Prevention of Catheter-associated Urinary Tract Infection*[4].

Settings: Surveillance will occur in any inpatient locations where denominator data can be collected, which may include critical intensive care units (ICU), specialty care areas (SCA), step down units, and long term care wards. Neonatal ICUs may participate, but only off plan (not as a part of their monthly reporting plan). A complete listing of inpatient locations and instructions for mapping can be found in CDC Locations and Descriptions chapter.

NOTE: It is not required to monitor for CAUTIs after the patient is discharged from the facility. However, if discovered, any CAUTI occurring on the day of discharge or the next day should be reported to NHSN; day of discharge is considered Day 1. No additional indwelling catheter days are reported.

Requirements: Surveillance for HAI CAUTI is performed in at least one inpatient location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:

Healthcare-associated infections (HAI): An infection is considered an HAI if all elements of a CDC/NHSN site-specific infection criterion were first present together on or after the 3rd hospital day (day of hospital admission is day 1). For an HAI, an element of the infection criterion may be present during the first 2 hospital days as long as it is also present on or after day 3. All elements used to meet the infection criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between elements.

Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria (Table 1 and Figures 1-5).

Date of event: For a UTI the date of event is the date when the last element used to meet the UTI infection criterion occurred. Synonyms: infection date, date of infection.

Indwelling catheter: A drainage tube that is inserted into the urinary bladder through the urethra is left in place, and is connected to a drainage bag (including leg bags), also called a Foley catheter. This does not include suprapubic, condom, or straight in-and-out catheters. This definition includes indwelling urethral catheters that are used for intermittent or continuous irrigation.

Catheter-associated UTI (CAUTI): A UTI where an indwelling urinary catheter was in place for >2 calendar days when all elements of the UTI infection criterion were first present together, with day of device placement being Day 1,
and
an indwelling urinary catheter was in place on the date of event or the day before.

EXAMPLE: A patient has a Foley catheter inserted on an inpatient unit and the following morning the patient meets criteria for a UTI. Because the catheter has not been in place >2 calendar days when all elements of the infection criterion were first present together, this is not a CAUTI.

NOTE:

1. SUTI 1b and 2b and other UTI (OUTI), as defined in the HAI Definitions chapter cannot be catheter-associated.

Location of attribution: The inpatient location where the patient was assigned on the date of the UTI event, which is further defined as the date when the last element used to meet the UTI criterion occurred (see exception below).

EXCEPTION TO LOCATION OF ATTRIBUTION:
Transfer Rule: If all elements of a CAUTI are present within 2 calendar days of transfer from one inpatient location to another in the same facility or a new facility (i.e., on the day of transfer or the next day), the infection is attributed to the transferring location or facility. Receiving facilities should share information about such HAIs with the transferring facility to enable reporting. This is called the Transfer Rule and examples are shown below:

- Patient with a Foley catheter in place in the SICU is transferred to the surgical ward. On the next day, all elements for UTI are first present together. This is reported to NHSN as a CAUTI for the SICU.
- Patient is transferred in the morning to the medical ward from the MSICU after having the Foley catheter removed. Later that night, all elements for a UTI are first present together. This is reported to NHSN as a CAUTI for the MSICU.

- On Monday, patient with a Foley catheter in place is transferred from the medical ward to the coronary care ICU (CCU). Wednesday in the CCU, all elements for UTI are first present together. This is reported to NHSN as a CAUTI for the CCU, as the UTI event date is on the 3rd calendar day after transfer.
- Patient on the urology ward of Hospital A had the Foley catheter removed after it had been in place for 5 days and is discharged home a few hours later. The IP from Hospital B calls the next day to report that this patient has been admitted to Hospital B with a UTI. This CAUTI should be reported to NHSN for Hospital A and attributed to the urology ward.

EXCEPTION TO TRANSFER RULE:
Locations which do not house patients overnight (e.g., Emergency Department or Operating Room) will have no denominator data, i.e., patient days or catheter days. Therefore, CAUTIs cannot be attributed to these locations. Instead, the CAUTI must be attributed to the next inpatient location in which the patient stays.

Table 1. ***Urinary Tract Infection Criteria***

Criterion	Urinary Tract Infection (UTI)
	Symptomatic UTI (SUTI) Must meet at least 1 of the following criteria:
1a	Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together. *and* at least 1 of the following signs or symptoms: fever (>38°C); suprapubic tenderness*****; costovertebral angle pain or tenderness***** *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). ----------OR---------- Patient had an indwelling urinary catheter in place for >2 calendar days and had it removed the day of or the day before all elements of this criterion were first present together *and* at least 1 of the following signs or symptoms: fever (>38°C); urgency*****; frequency*****; dysuria*****; suprapubic tenderness*****; costovertebral angle pain or tenderness***** *and* a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). *****With no other recognized cause
1b	Patient did <u>not</u> have an indwelling urinary catheter in place at the time of or the day before all elements of this criterion were first present together *and* has at least 1 of the following signs or symptoms: fever (>38°C) in a patient that is ≤65 years of age; urgency*****; frequency*****; dysuria*****; suprapubic tenderness*****; costovertebral angle pain or tenderness***** *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). *****With no other recognized cause

Criterion	Urinary Tract Infection (UTI)
2a	Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together *and* at least 1 of the following signs or symptoms: fever (>38°C); suprapubic tenderness*****; costovertebral angle pain or tenderness***** *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 of unspun urine or >5 WBC/high power field of spun urine) c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of ≥10^3 and <10^5 CFU/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). ----------OR---------- Patient with an indwelling urinary catheter in place for > 2 calendar days and had it removed the day of or the day before all elements of this criterion were first present together *and* at least 1 of the following signs or symptoms: fever (>38°C); urgency*****; frequency*****; dysuria*****; suprapubic tenderness*****; costovertebral angle pain or tenderness***** *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or >5 WBC/high power field of spun urine c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of ≥10^3 and <10^5 CFU/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). *****With no other recognized cause

Criterion	Urinary Tract Infection (UTI)
2b	Patient did not have an indwelling urinary catheter in place at the time of, or the day before all elements of this criterion were first present together *and* has at least 1 of the following signs or symptoms: fever (>38°C) in a patient that is ≤65 years of age; urgency*; frequency*; dysuria*; suprapubic tenderness*; costovertebral angle pain or tenderness* *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or >5 WBC/high power field of spun urine c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of ≥10^3 and <10^5 CFU/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). *With no other recognized cause
3	Patient ≤1 year of age with** or without an indwelling urinary catheter has at least 1 of the following signs or symptoms: fever (>38°C core); hypothermia (<36°C core); apnea*; bradycardia*; dysuria*; lethargy*; vomiting* *and* a positive urine culture of ≥10^5 CFU/ml with no more than 2 species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). *With no other recognized cause ** Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together.
4	Patient ≤1 year of age with** or without an indwelling urinary catheter has at least 1 of the following signs or symptoms: fever (>38°C core); hypothermia (<36°C core); apnea*; bradycardia*; dysuria*; lethargy*; vomiting* *and* at least 1 of the following findings: a. positive dipstick for leukocyte esterase and/or nitrite b. pyuria (urine specimen with ≥10 WBC/mm^3 of unspun urine or >5 WBC/high power field of spun urine c. microorganisms seen on Gram's stain of unspun urine *and* a positive urine culture of between ≥10^3 and <10^5 CFU/ml with no more than two species of microorganisms. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section

Criterion	Urinary Tract Infection (UTI)
	below). *With no other recognized cause ** Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together.

Criterion	Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)
	Patient with* or without an indwelling urinary catheter has no signs or symptoms (i.e., for any age patient, no fever (>38°C); urgency; frequency; dysuria; suprapubic tenderness; costovertebral angle pain or tenderness OR for a patient ≤1 year of age; no fever (>38°C core); hypothermia (<36°C core); apnea; bradycardia; dysuria; lethargy; or vomiting) *and* a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of uropathogen microorganisms** (see Comments section below) *and* a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture, or at least 2 matching blood cultures drawn on separate occasions if the matching pathogen is a common skin commensal. Elements of the criterion must occur within a timeframe that does not exceed a gap of 1 calendar day (see Comments section below). *Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together. **Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus spp.*, yeasts, beta-hemolytic *Streptococcus spp*., *Enterococcus spp*., *G. vaginalis*, *Aerococcus urinae*, and *Corynebacterium* (urease positive)[+]. [+]Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified (COS*) or as *C. urealyticum* (CORUR) if so speciated. (See complete list of uropathogen microorganisms at http://www.cdc.gov/nhsn/XLS/master-organism-Com-Commensals-Lists.xlsx)
Comments	• Laboratory cultures reported as "mixed flora" represent at least 2 species of organisms. Therefore an additional organism recovered from the same culture, would represent >2 species of microorganisms. Such a specimen cannot be used to meet the UTI criteria. • Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection. • Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization. Specimens from indwelling catheters should be aspirated through the disinfected sampling ports. • In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration. • Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate

	urine preservative. Refrigerated specimens should be cultured within 24 hours. • Urine specimen labels should indicate whether or not the patient is symptomatic. • Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI). • Report only pathogens in both blood and urine specimens for ABUTI. • Report *Corynebacterium* (urease positive) as either *Corynebacterium species* unspecified (COS) or as *C. urealyticum* (CORUR) if speciated.

Figure 1: Identification and Categorization of SUTI with Indwelling Catheter (see comments section page 7-7 thru 7-8 for important details)

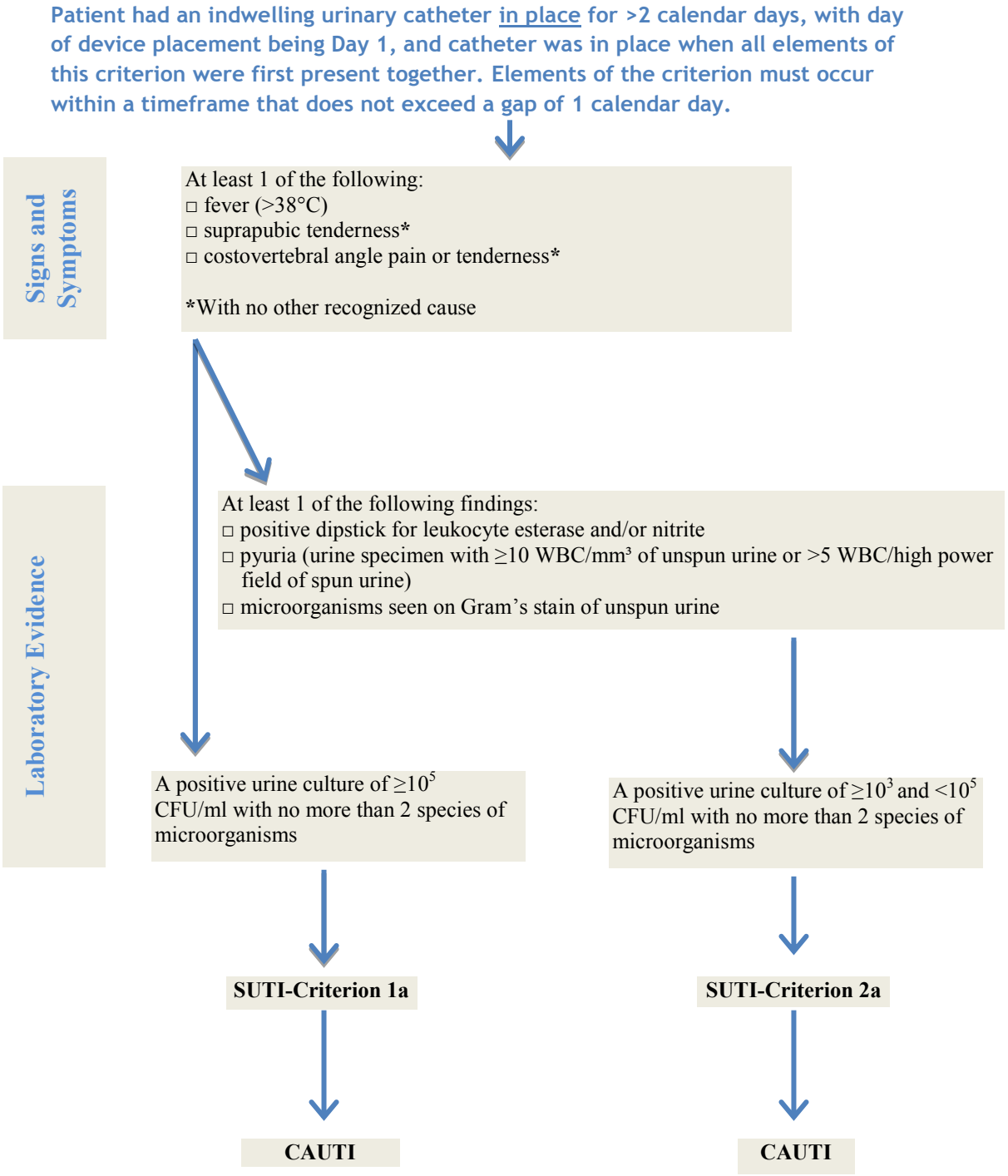


Figure 2: Identification and Categorization of SUTI When Indwelling Catheter has been removed (see comments section page 7-7 thru 7-8 for important details)

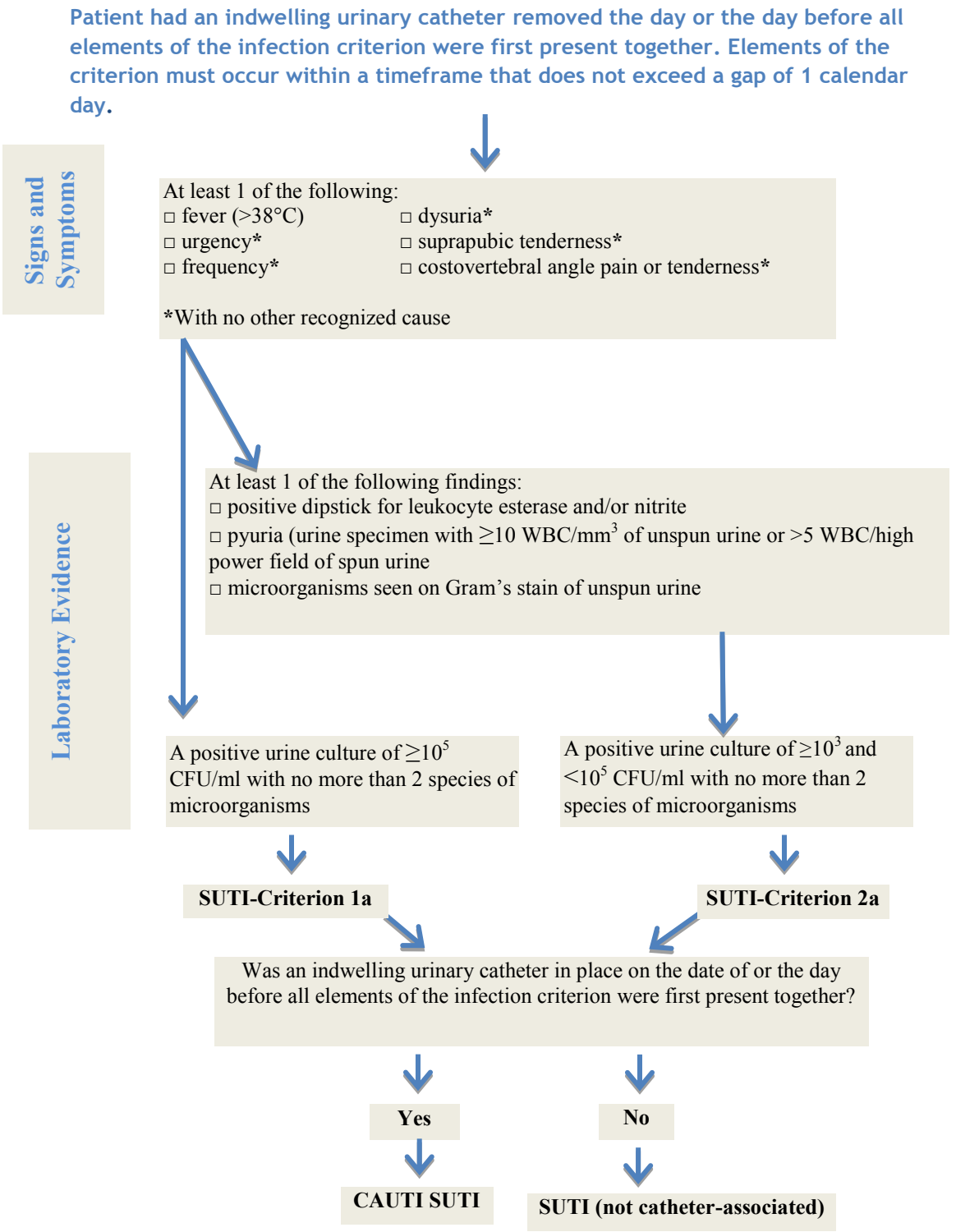


Figure 3: Identification and Categorization of SUTI without Indwelling Catheter (see comments section page 7-7 thru 7-8 for important details)

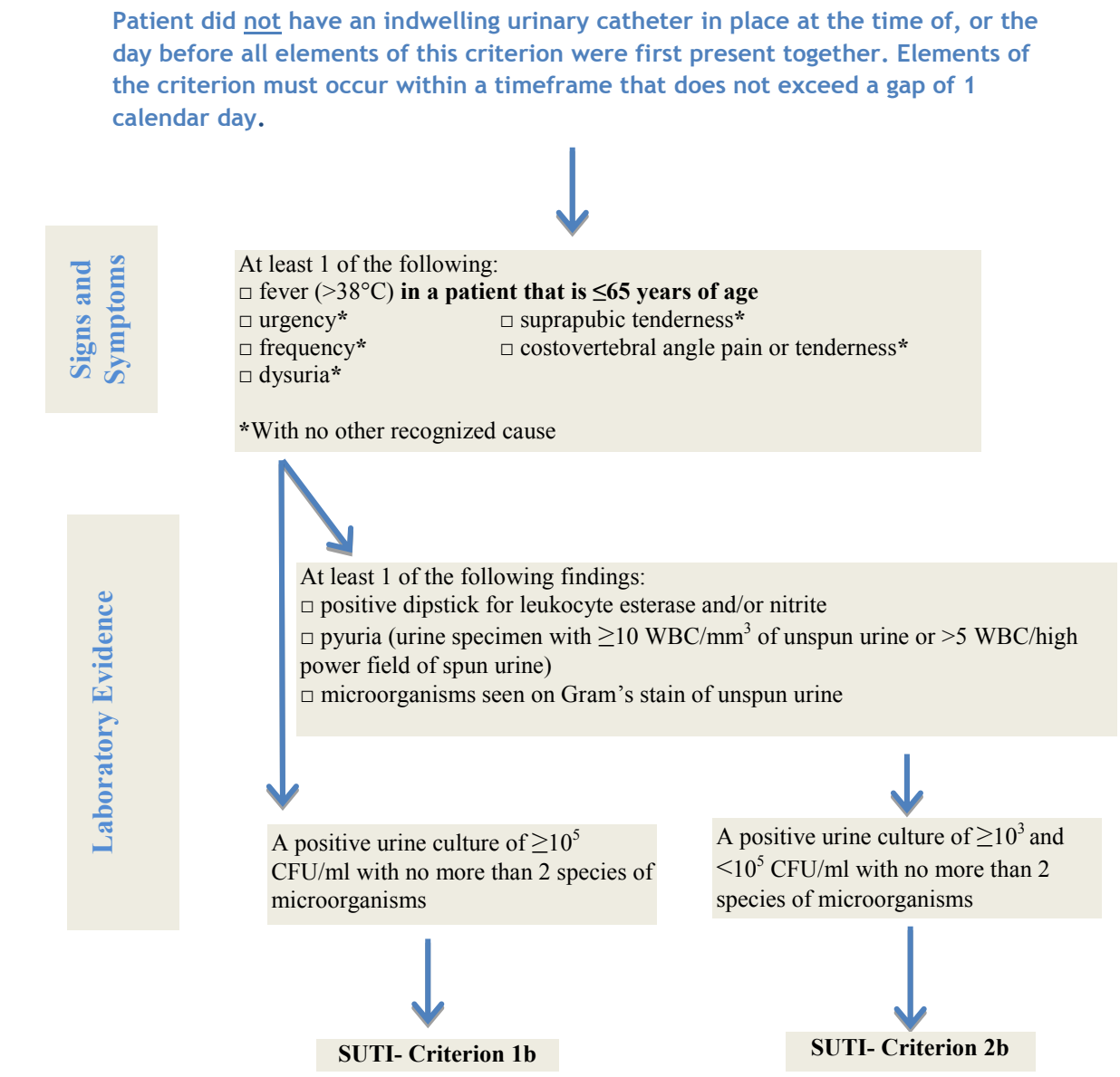
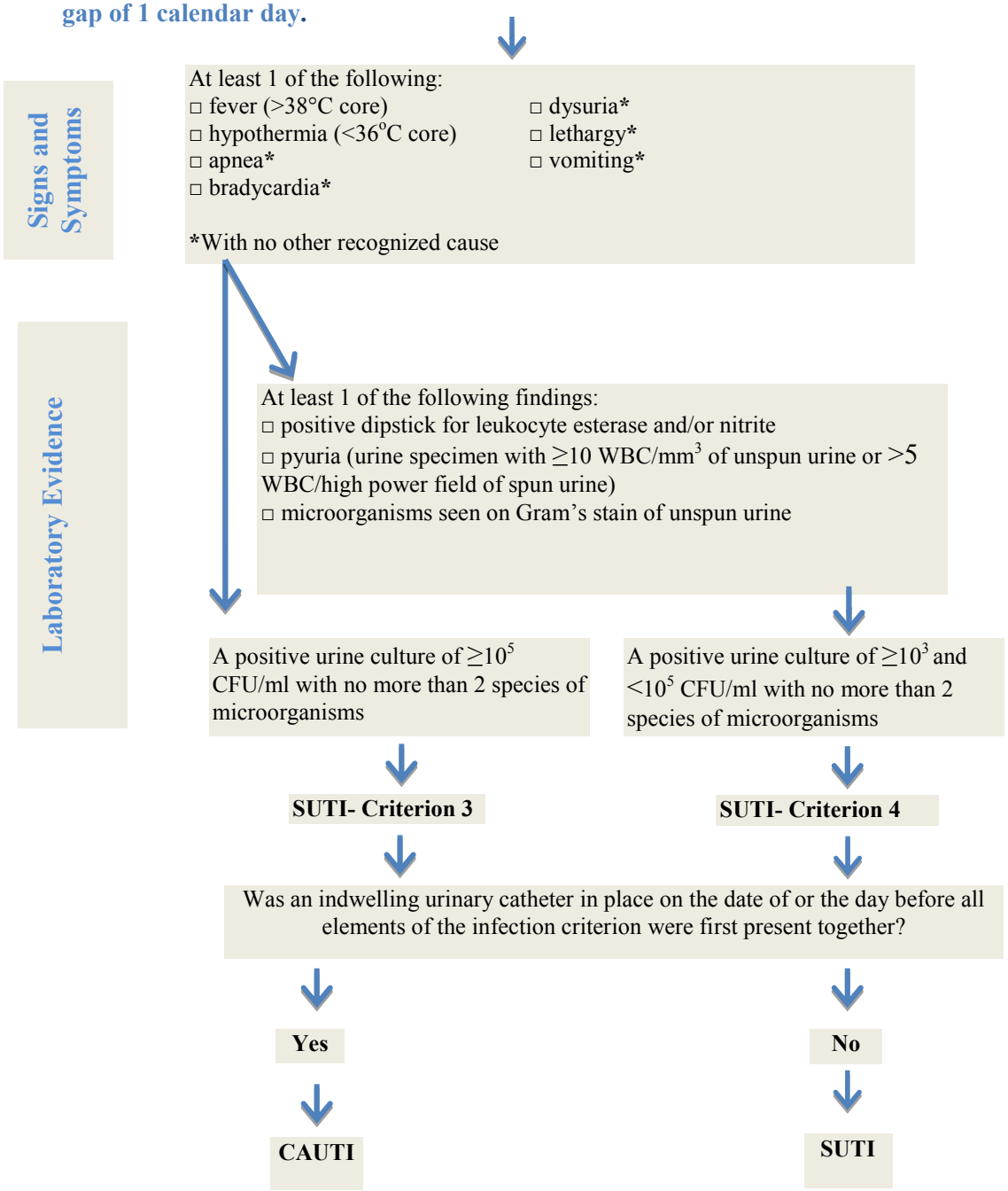
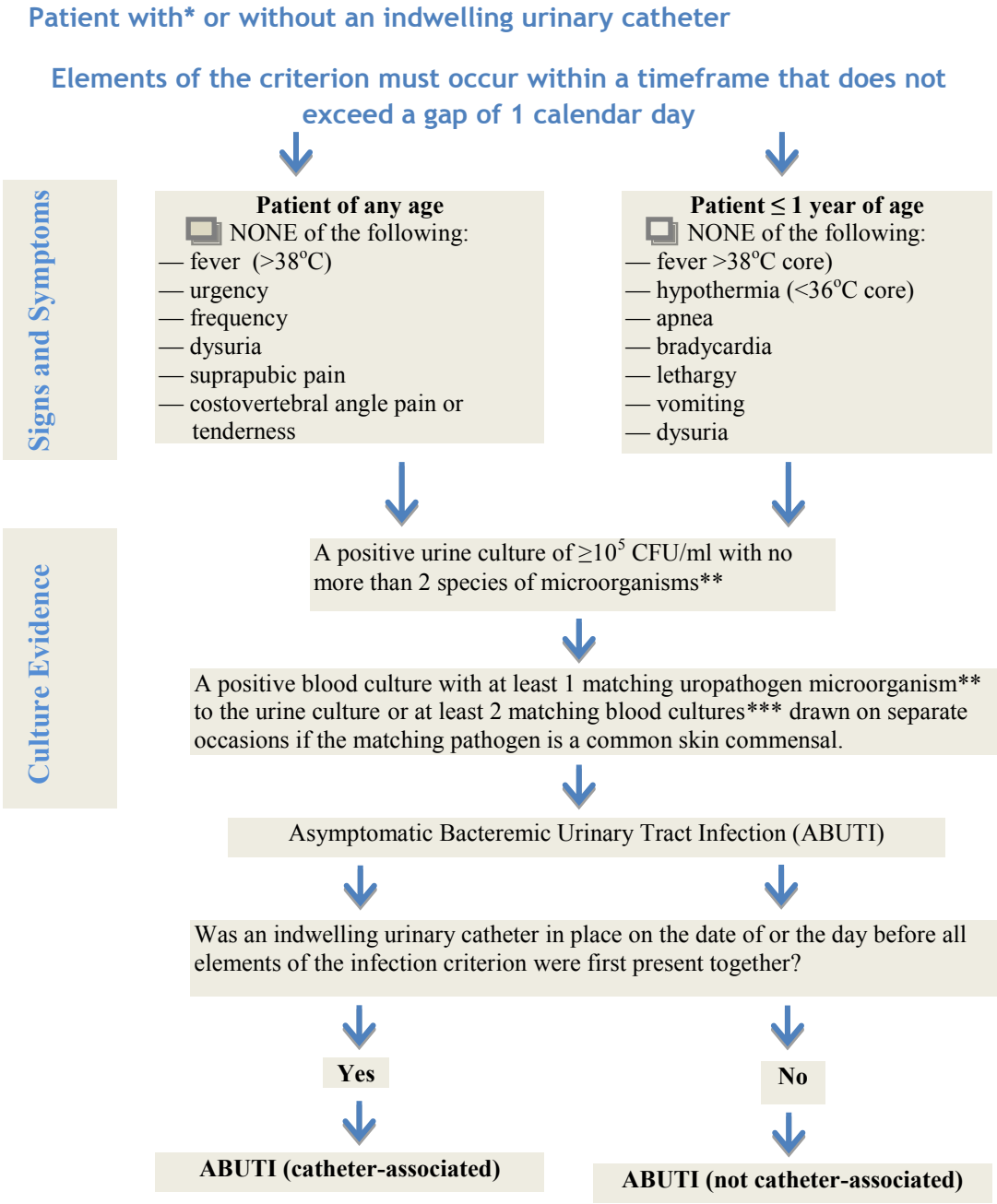


Figure 4: Identification and Categorization of SUTI in Patient ≤1 Year of Age (see comments section page 7-7 thru 7-8 for important details)



** Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together.

Figure 5: Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)
(see comments section page 7-7 thru 7-8 for important details)



* Patient had an indwelling urinary catheter in place for >2 calendar days, with day of device placement being Day 1, and catheter was in place when all elements of this criterion were first present together.

**Uropathogen microorganisms are: Gram-negative bacilli, *Staphylococcus* spp., yeasts, beta-hemolytic *Streptococcus* spp., *Enterococcus* spp., *G. vaginalis*, *Aerococcus urinae*, *Corynebacterium* (urease positive)[†].

Only genus and species identification should be utilized to determine the sameness of organisms (i.e. matching organisms). No additional comparative methods should be used (e.g., morphology or antibiograms) because laboratory testing capabilities and protocols may vary between facilities.

[†]Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (CORS) or as *C. urealyticum (CORUR) if so speciated*.

Numerator Data: The *Urinary Tract Infection (UTI)* form is used to collect and report each CAUTI that is identified during the month selected for surveillance. The Instructions for Completion of Urinary Tract Infection form include brief instructions for collection and entry of each data element on the form. The UTI form includes patient demographic information and information on whether or not an indwelling urinary catheter was present. Additional data include the specific criteria met for identifying the UTI, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

REPORTING INSTRUCTIONS:

- If no CAUTIs are identified during the month of surveillance, the Report No Events box must be checked on the appropriate denominator summary screen, e.g., *Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU or SCA/ONC).*

Denominator Data: Device days and patient days are used for denominators (See Key Terms chapter). Indwelling urinary catheter days, which are the number of patients with an indwelling urinary catheter device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.117 and 57.118). These daily counts are summed and only the total for the month is entered into NHSN. Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored. When denominator data are available from electronic databases, these sources may be used as long as the counts are not substantially different (+/- 5%) from manually collected counts, validated for a minimum of 3 months.

Data Analyses: The Standardized Infection Ratio (SIR) is calculated by dividing the number of observed infections by the number of expected infections. The number of expected infections, in the context of statistical prediction, is calculated using CAUTI rates from a standard population during a baseline time period, which represents a standard population's CAUTI experience.[5]

NOTE: The SIR will be calculated only if the number of expected HAIs (numExp) is ≥1.

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

While the CAUTI SIR can be calculated for single locations, the measure also allows you to summarize your data by multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one CAUTI SIR adjusting for all locations reported. Similarly, you can obtain one CAUTI SIR for all specialty care areas in your facility.

The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of catheter days and multiplying the result by 1000. The Urinary Catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days. These calculations will be performed separately for the different types of ICUs, specialty care areas, and other locations in the institution, except for neonatal locations.

---

[1]Magill SS, Hellinger W, et al. Prevalence of healthcare-associated infections in acute care facilities. Infect Control Hosp Epidemiol. 2012;33:283-91.

[2]Scott Rd. The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention, 2009. Division of Healthcare Quality Promotion, National Center for Preparedness, Detection, and Control of Infectious Diseases, Coordinating Center for Infectious Diseases, Centers for Disease Control and Prevention, February 2009.

[3]Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

[4]Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA. Guideline for prevention of catheter-associated urinary tract infections 2009. Infect Control Hosp Epidemiol. 2010;31:319-26.

[5]Dudeck MA, Horan TC, Peterson KD, et al. National Healthcare Safety Network (NHSN) report, data summary for 2009, device-associated module, issued January 2011. Am J Infect Control 2011;39:349-67.

3. Tools from the www.catheterout.org website

a. CAUTI Guide to Patient Safety.

Over the past decade our multi-disciplinary research team has received funding support from the Department of Veterans Affairs (VA), the National Institutes of Health (NIH), and the Agency for Healthcare Research and Quality (AHRQ) to better understand why some hospitals are more successful than others in preventing device-associated infection. This work includes conducting qualitative assessments of a total of 43 hospitals across the United States. In total, we have conducted 400 interviews of personnel at various levels within the organizations, from chief executive officers to front-line nurses and physicians.

From these interviews, we found that a handful of critical issues seemed to arise irrespective of a hospital's location or size. While some were technical issues (collecting data and assessing catheter necessity), many were related to common barriers to effective CAUTI prevention (e.g., lack of a physician champion, nursing resistance, poor leadership support). Understanding that while useful, in person visits are both time-consuming and resource-intensive, we thus began work on a self-administered list of questions (The CAUTI Guide to Patient Safety, or "GPS") that could be completed by key informants to help guide their hospital's approach to CAUTI prevention. We developed the GPS initially for hospitals that have already initiated some CAUTI prevention activities, but have fallen short of their desired success. Having begun the implementation process, they are more likely to be aware of the challenges at their site.

Question 1: Do you currently have a well-functioning team (or work group) focusing on CAUTI prevention?

Yes No

Question 2: Do you have a project manager with dedicated time to coordinate your CAUTI prevention activities?

Yes No

Question 3: Do you have an effective nurse champion for your CAUTI prevention activities?

Yes No

Question 4: Do bedside nurses assess, at least daily, whether their catheterized patients still need a urinary catheter?

Yes No

Question 5: Do bedside nurses take initiative to ensure the indwelling urinary catheter is removed when the catheter is no longer needed (e.g., by contacting the physician or removing the catheter per protocol)?

Yes No

Question 6: Do you have an effective physician champion for your CAUTI prevention activities?

Yes No

Question 7: Is senior leadership supportive of CAUTI prevention activities?

Yes No

Question 8: Do you currently collect CAUTI-related data (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates) in the unit(s) in which you are intervening?

Yes No

Question 9: Do you routinely feedback CAUTI-related data to frontline staff (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates)?

Yes No

Question 10: Have you experienced any of the following barriers?

A. Substantial nursing resistance

Yes No

B. Substantial physician resistance

Yes No

C. Patient and family requests for an indwelling urinary catheter

Yes No

D. Indwelling urinary catheters commonly being inserted in the emergency department without an appropriate indication

Yes No

CAUTI Cost Calculator

The *CAUTI Cost Calculator* estimates your hospital's costs due to catheter-associated urinary tract infections (CAUTI), which are the most common form of hospital-acquired infection.

It can be used to estimate both current costs and projected costs after a hypothetical intervention to reduce catheter use, a protocol that involves daily assessment of the need for a catheter.

Try estimating the CAUTI costs for your hospital:

Hospital inputs:	
Number of annual adult hospital admissions	3000
Percentage of adult hospitalized patients with indwelling urinary catheter on any given day (0-100)	15
Mean duration of urinary catheterization (in days)	6.68
Cost inputs:	
Per-person cost of symptomatic urinary tract infection ($)	911
Per-person cost of bloodstream infection ($)	3824
Intervention inputs:	
Percent decrease in catheterization duration caused by intervention (0-100)	37
Percent decrease in urinary catheter placement caused by intervention (0-100)	29

Submit

If you aren't sure about your hospital's numbers, you can leave the fields blank and the calculator will use suggested default values from the literature.

Here's an example:

For a hospital using all the default values, we get the following results:

CURRENT ESTIMATED COSTS:

$37,869

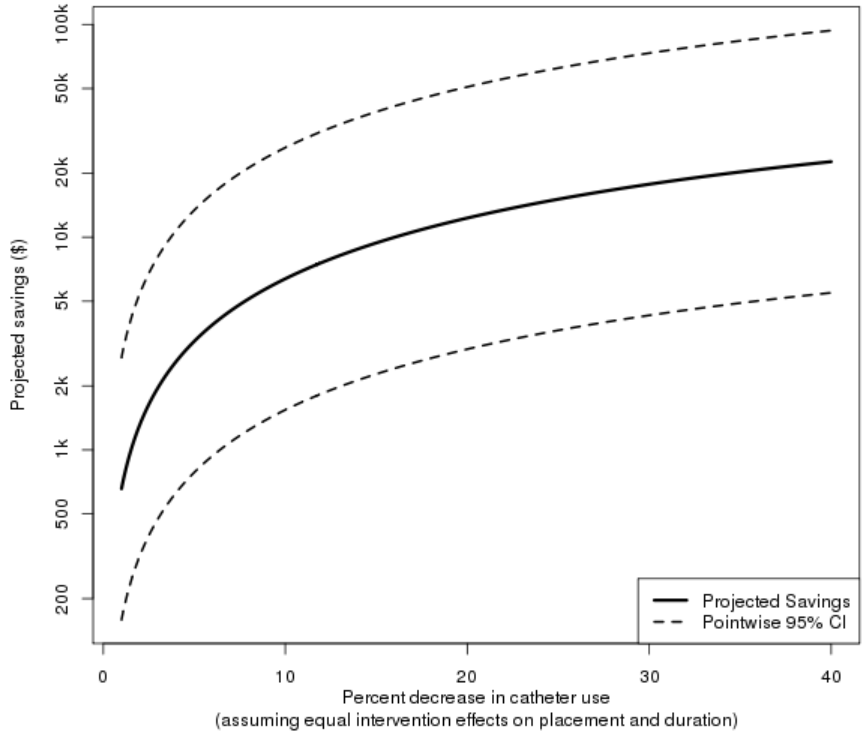
Projected costs after intervention*:

$18,743

PROJECTED SAVINGS (95% CI):

$19,126 ($4,626 - $79,075)

* Based on an intervention with a 37% decrease in duration and a 29% decrease in placement.



For this hypothetical hospital, the current yearly costs due to catheter-related infections are estimated to be $37,869.

After an intervention that reduces catheter duration by 37% and catheter placement by 29% (i.e., 10.7% catheterized instead of 15%), the projected savings are $19,126 (95% interval estimates: $4,626 - $79,075).

Projected savings are also shown for interventions that equally reduce duration and placement (across a range from 0% to 40%).

Some details:

The CAUTI cost calculator works by combining relevant risk and cost estimates from past research on catheter-associated complications.

Saint (2000) provides estimates of the risk of bacteriuria, symptomatic urinary tract infection (SUTI), and bloodstream infection (BSI), as well as estimates of the costs associated with SUTI and BSI, computed via microcosting techniques. We combine these estimates to produce new estimates of hospital-specific savings across a range of hypothetical interventions that reduce (i) the duration of catheterization and (ii) the proportion of patients with catheters. This dual-component characterization of interventions to reduce CAUTI is similar to that taken in Fakih et al. (2012).

We focus specifically on savings after the estimated reductions in duration from Meddings et al. (2010) and in placement from Fakih et al. (2010).

References:

Fakih MG, Greene MT, Kennedy EH, Meddings JA, Krein SL, Olmsted RN, Saint S. Introducing a population-based outcome measure to evaluate the effect of interventions to reduce catheter-associated urinary tract infection. *American Journal of Infection Control.* 2012; 40(4): 359-64.

Fakih MG, Pena ME, Shemes S, Rey J, Berriel-Cass D, Szpunar SM, Savoy-Moore RT, Saravolatz LD. Effect of establishing guidelines on appropriate urinary catheter placement. *Academic Emergency Medicine.* 2010; 17: 337-340.

Kennedy EH, Greene MT, Saint S. Estimating hospital costs of catheter-associated urinary tract infection. *J Hosp Med* 2013;9(9):519-522.

Meddings J, Rogers MAM, Macy M, Saint S. Systematic review and meta-analysis: reminder systems to reduce catheter-associated urinary tract infections and urinary catheter use in hospitalized patients. *Clinical Infectious Diseases.* 2010; 51(5): 550-560.

Saint S. Clinical and economic consequences of nosocomial catheter-related bacteriuria. *American Journal of Infection Control.* 2000; 28(1): 68-75.

Acknowledgments:

This calculator was developed by Edward Kennedy, MS, of the University of Michigan(UM)/Department of Veterans Affairs **Patient Safety Enhancement Program**. The web interface for the calculator was developed by Jeremy Hallum and Drew Montag of UM Medical School Information Systems.

Implementing Change: The Technical & Socio-Adaptive Aspects of Preventing CAUTI

Sanjay Saint, MD, MPH
George Dock Collegiate Professor of Medicine
Ann Arbor VA Medical Center
University of Michigan Medical School

"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

How Can We Implement Changes to Reduce Indwelling Catheter Use?

Implementation

Technical

Socio-adaptive

Catheter-Associated Urinary Tract Infection (CAUTI) Prevention

The Technical Aspects

Recent Guidelines on CAUTI Prevention

www.catheterout.org

SUPPLEMENT ARTICLE: SHEA/IDSA PRACTICE RECOMMENDATION

Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals

Evelyn Lo, MD; Lindsay Nicolle, MD; David Classen, MD, MS; Kathleen M. Arias, MS, CIC; Kelly Podgorny, RN, MS, CPHQ; Deverick J. Anderson, MD, MPH; Helen Burstin, MD; David P. Calfee, MD, MS; Susan E. Coffin, MD, MPH; Erik R. Dubberke, MD; Victoria Fraser, MD; Dale N. Gerding, MD; Frances A. Griffin, RRT, MPA; Peter Gross, MD; Keith S. Kaye, MD; Michael Klompas, MD; Jonas Marschall, MD; Leonard A. Mermel, DO, ScM; David A. Pegues, MD; Trish M. Perl, MD; Sanjay Saint, MD; Cassandra D. Salgado, MD, MS; Robert A. Weinstein, MD; Robert Wise, MD; Deborah S. Yokoe, MD, MPH

PURPOSE

Previously published guidelines are available that provide comprehensive recommendations for detecting and preventing healthcare-associated infections. The intent of this document is to highlight practical recommendations in a concise format designed to assist acute care hospitals in implementing and prioritizing their catheter-associated urinary tract infection (CAUTI) prevention efforts. Refer to the Society for Healthcare Epidemiology of America/Infectious Diseases Society of America "Compendium of Strategies to Prevent Healthcare-Associated Infections" Executive Summary and Introduction and accompanying editorial for additional discussion.

SECTION 1: RATIONALE AND STATEMENTS OF CONCERN

1. Burden of CAUTIs

a. Urinary tract infection is the most common hospital-acquired infection; 80% of these infections are attributable to an indwelling urethral catheter.[1]

b. Twelve to sixteen percent of hospital inpatients will have a urinary catheter at some time during their hospital stay.[2]

c. The daily risk of acquisition of urinary infection varies from 3% to 7% when an indwelling urethral catheter remains in situ.

2. Outcomes associated with CAUTI

a. Urinary tract infection is the most important adverse outcome of urinary catheter use. Bacteremia and sepsis may occur in a small proportion of infected patients.[3,4]

b. Morbidity attributable to any single episode of catheterization is limited,[3] but the high frequency of catheter use in hospitalized patients means that the cumulative burden of CAUTI is substantial.[1,5,6]

c. Catheter use is also associated with negative outcomes other than infection, including nonbacterial urethral inflammation,[7] urethral strictures,[8] and mechanical trauma.

3. Risk factors for development of CAUTI

a. The duration of catheterization is the most important risk factor for development of infection.[1,9-11] Limiting catheter use and, when a catheter is indicated, minimizing the duration the catheter remains in situ are primary strategies for CAUTI prevention.

b. Additional risk factors include female sex, older age, and not maintaining a closed drainage system.

From the University of Manitoba, Winnipeg, Canada (E.L., L.N.); the University of Utah, Salt Lake City (D.C.); the Association for Professionals in Infection Control and Epidemiology (K.M.A.) and the National Quality Forum (H.B.), Washington, D.C.; the Joint Commission, Oakbrook Terrace (K.P., R.W.), the Loyola University Chicago Stritch School of Medicine (D.N.G.) and the Stroger (Cook County) Hospital and Rush University Medical Center (R.A.W.), Chicago, and the Hines Veterans Affairs Medical Center, Hines (D.N.G.), Illinois; the Duke University Medical Center, Durham, North Carolina (D.J.A., K.S.K.); the Mount Sinai School of Medicine, New York, New York (D.P.C.); the Children's Hospital of Philadelphia and University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania (S.E.C.); the Washington University School of Medicine, St. Louis, Missouri (E.R.D., V.F., J.M.); the Institute for Healthcare Improvement, Cambridge (F.A.G.), and Brigham and Women's Hospital and Harvard Medical School, Boston (D.S.Y., M.K.), Massachusetts; the Hackensack University Medical Center, Hackensack (P.G.), and the University of Medicine and Dentistry–New Jersey Medical School, Newark (P.G.), New Jersey; the Warren Alpert Medical School of Brown University and Rhode Island Hospital, Providence, Rhode Island (L.A.M.); the David Geffen School of Medicine at the University of California, Los Angeles (D.A.P.); the Johns Hopkins Medical Institutions and University, Baltimore, Maryland (T.M.P.); the Ann Arbor Veterans Affairs Medical Center and the University of Michigan Medical School, Ann Arbor, Michigan (S.S.); the Medical University of South Carolina, Charleston (C.D.S.).

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Infect Control Hosp Epidemiol 2008; 29:S41–S50
 0899-823X/2008/2910S1-0006$15.00. DOI: 10.1086/591066

An APIC Guide

2008

Guide to the Elimination of Catheter-Associated Urinary Tract Infections (CAUTIs)

Developing and Applying Facility-Based Prevention Interventions in Acute and Long-Term Care Settings

Linda Greene, RN, MS, CIC
James Marx, RN, MS, CIC
Shannon Oriola, RN, CIC, COHN

About APIC

APIC's mission is to improve health and patient safety by reducing risks of infection and other adverse outcomes. The Association's more than 12,000 members have primary responsibility for infection prevention, control and hospital epidemiology in healthcare settings around the globe. APIC's members are nurses, epidemiologists, physicians, microbiologists, clinical pathologists, laboratory technologists and public health professionals. APIC advances its mission through education, research, consultation, collaboration, public policy, practice guidance and credentialing.

Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America

Thomas M. Hooton,[1] Suzanne F. Bradley,[2] Diana D. Cardenas,[2] Richard Colgan,[4] Suzanne E. Geerlings,[7] James C. Rice,[5,a] Sanjay Saint,[3] Anthony J. Schaeffer,[6] Paul A. Tambayh,[8] Peter Tenke,[9] and Lindsay E. Nicolle[10,11]

Departments of [1]Medicine and [2]Rehabilitation Medicine, University of Miami, Miami, Florida; [3]Department of Internal Medicine, Ann Arbor Veterans Affairs Medical Center and the University of Michigan, Ann Arbor, Michigan; [4]Department of Family and Community Medicine, University of Maryland, Baltimore; [5]Department of Medicine, University of Texas, Galveston; [6]Department of Urology, Northwestern University, Chicago, Illinois; [7]Department of Infectious Diseases, Tropical Medicine, and AIDS, University of Amsterdam, Amsterdam, The Netherlands; [8]Department of Medicine, National University of Singapore, Singapore; [9]Department of Urology, Jahn Ference Del-Pesti Korhaz, Budapest, Hungary; and Departments of [10]Internal Medicine and [11]Medical Microbiology, University of Manitoba, Winnipeg, Canada

Guidelines for the diagnosis, prevention, and management of persons with catheter-associated urinary tract infection (CA-UTI), both symptomatic and asymptomatic, were prepared by an Expert Panel of the Infectious Diseases Society of America. The evidence-based guidelines encompass diagnostic criteria, strategies to reduce the risk of CA-UTIs, strategies that have not been found to reduce the incidence of urinary infections, and management strategies for patients with catheter-associated asymptomatic bacteriuria or symptomatic urinary tract infection. These guidelines are intended for use by physicians in all medical specialties who perform direct patient care, with an emphasis on the care of patients in hospitals and long-term care facilities.

EXECUTIVE SUMMARY

Catheter-associated (CA) bacteriuria is the most common health care–associated infection worldwide and is a result of the widespread use of urinary catheterization, much of which is inappropriate, in hospitals and long-term care facilities (LTCFs). Considerable personnel time and other costs are expended by health care institutions to reduce the rate of CA infections, especially those that occur in patients with symptoms or signs referable to the urinary tract (CA urinary tract infection [CA-UTI]). In these guidelines, we provide background information on the epidemiology and pathogenesis of CA infections and evidence-based recommendations for their diagnosis, prevention and management. Unfortunately, the catheter literature generally reports on CA asymptomatic bacteriuria (CA-ASB) or CA bacteriuria (used when no distinction is made between CA-ASB and CA-UTI; such cases are predominantly CA-ASB), rather than on CA-UTI. As a result, most recommendations in these guidelines refer to CA-bacteriuria, because this is the only or predominant out-

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* Present affiliation: Department of Molecular and Experimental Medicine, The Scripps Research Institute, La Jolla, California.

Reprints or correspondence: Dr Thomas M. Hooton, 1120 NW 14th St, Ste 1144, Clinical Research Bldg, University of Miami Miller School of Medicine, Miami, FL 33136 (thooton@med.miami.edu).

Clinical Infectious Diseases 2010;50:625–663

1058-4838/2010/5005-0001$15.00
DOI: 10.1086/650482

These guidelines were developed by the Infectious Diseases Society of America in collaboration with the American Geriatrics Society, American Society of Nephrology, American Spinal Injury Association, American Urological Association, Association of Medical Microbiology and Infectious Diseases–Canada, European Association of Urology , European Society of Clinical Microbiology and Infectious Diseases, Society for Healthcare Epidemiology of America, Society of Hospital Medicine, and the Western Pacific Society of Chemotherapy.

It is important to realize that guidelines cannot always account for individual variation among patients. They are not intended to supplant physician judgment with respect to particular patients or special clinical situations. The IDSA considers adherence to these guidelines to be voluntary, with the ultimate determination regarding their application to be made by the physician in the light of each patient's individual circumstances.

HICPAC

HEALTHCARE INFECTION CONTROL PRACTICES ADVISORY COMMITTEE

GUIDELINE FOR PREVENTION OF CATHETER-ASSOCIATED URINARY TRACT INFECTIONS 2009

Carolyn V. Gould, MD, MSCR [1]; Craig A. Umscheid, MD, MSCE [2]; Rajender K. Agarwal, MD, MPH [2]; Gretchen Kuntz, MSW, MSLIS [2]; David A. Pegues, MD [3] and the Healthcare Infection Control Practices Advisory Committee (HICPAC) [4]

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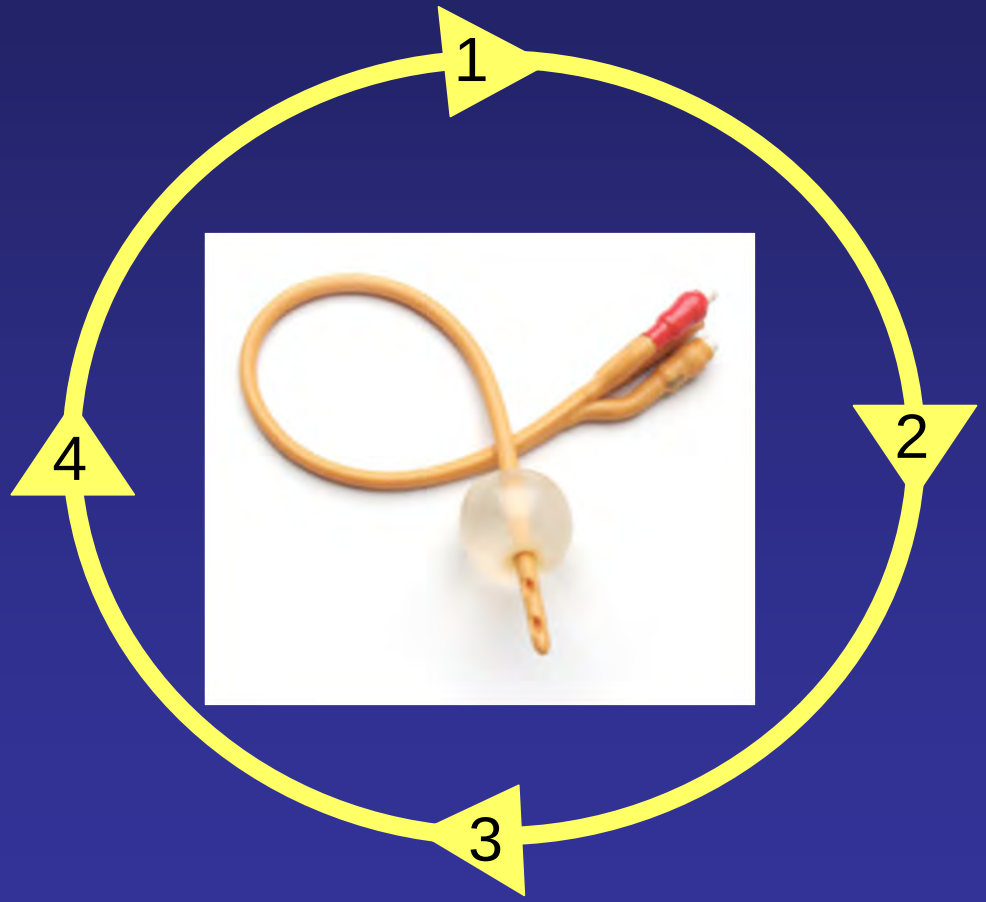
David Geffen School of Medicine at UCLA
Los Angeles, CA

Total number of pages of all 4 documents = 414 pages

Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement



2. Maintaining Awareness & Proper Care of Catheters

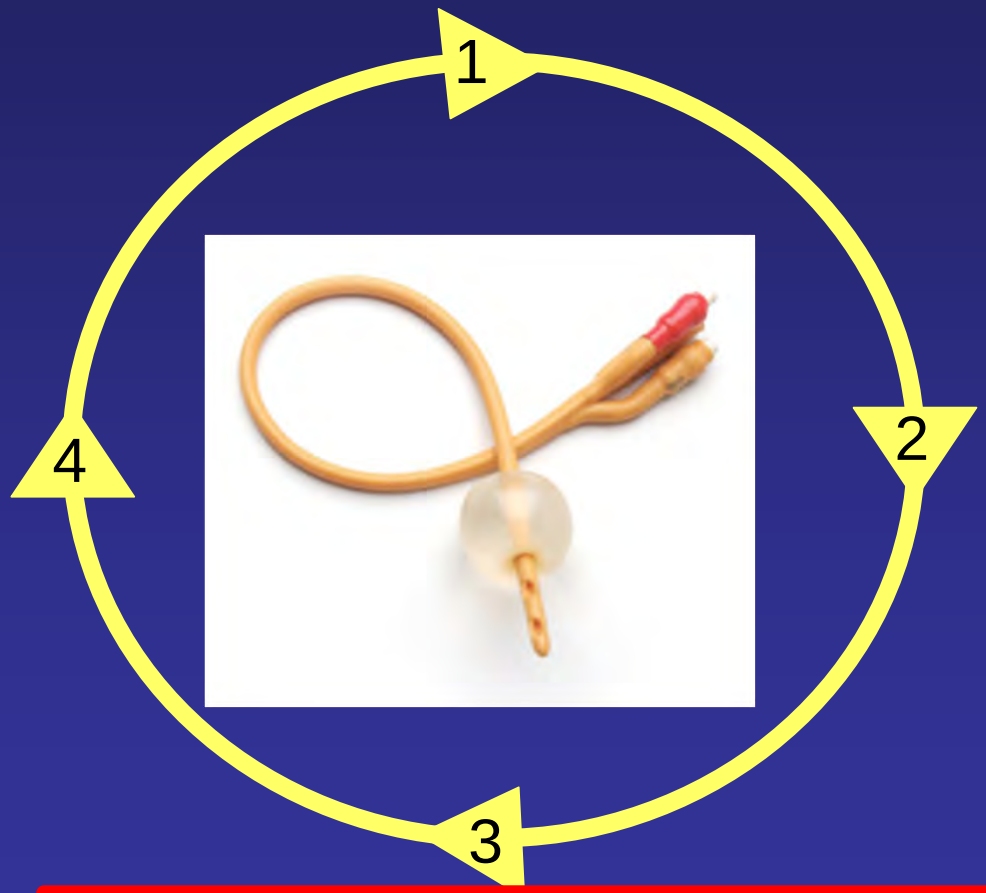
3. Prompting Catheter Removal

4. Preventing Catheter Replacement

(Meddings. Clin Infect Dis 2011)

Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement



2. Maintaining Awareness & Proper Care of Catheters

3. Prompting Catheter Removal

4. Preventing Catheter Replacement

(Meddings. Clin Infect Dis 2011)

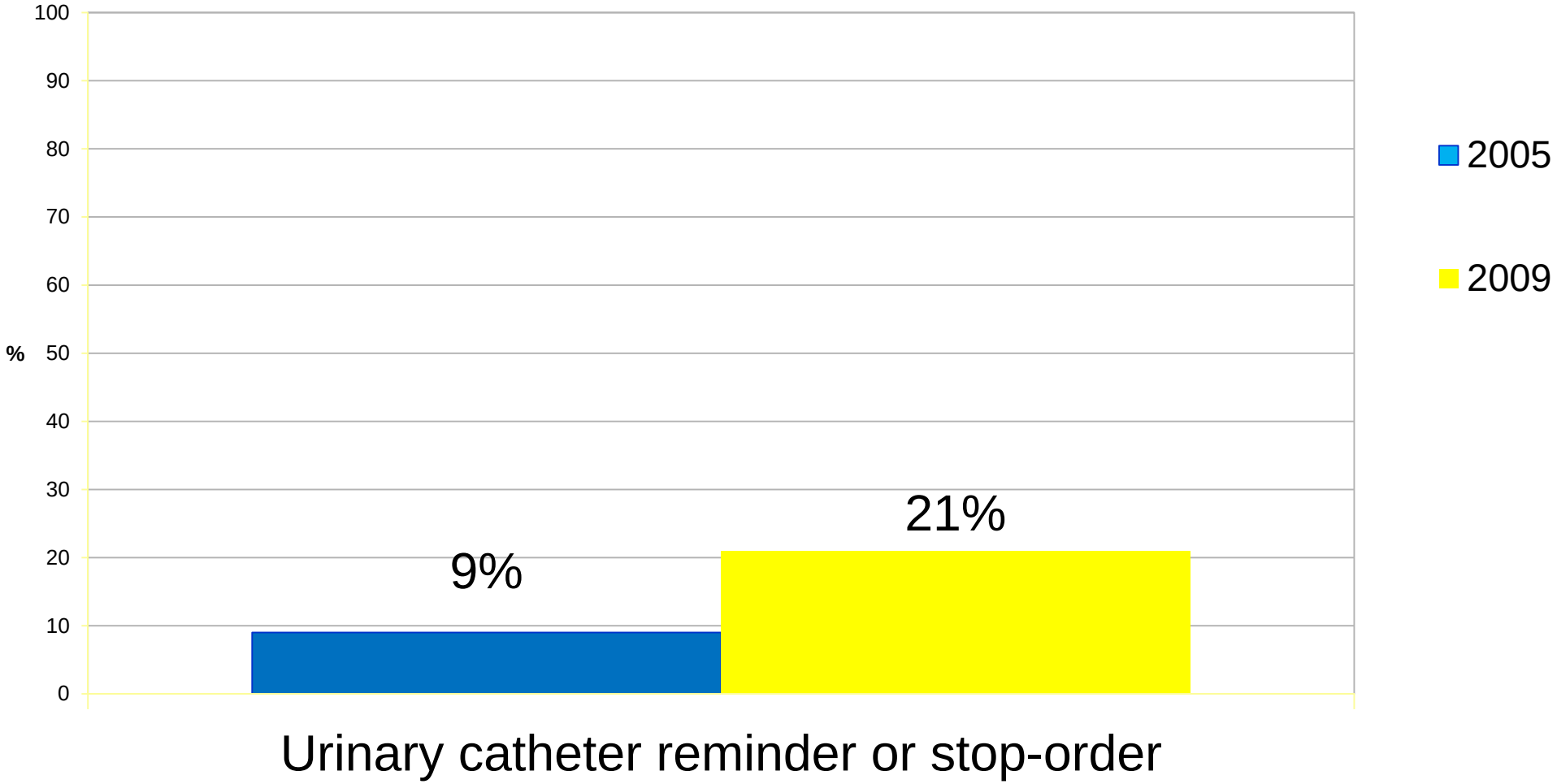
A Systems (and Technical) Solution: Timely Removal of Indwelling Catheters

- 14 studies have evaluated urinary catheter reminders and stop-orders (written, computerized, nurse-initiated)
  - Significant reduction in catheter use (~2.5 days)
  - Significant reduction in infection (~50%)
  - No evidence of harm (ie, re-insertion)

(Meddings J et al. Clin Infect Dis 2010)

Regularly Using to Prevent CAUTI: 2005 vs. 2009 U.S. National Data

(Krein et al. J Gen Intern Med 2011)



Implementing Change

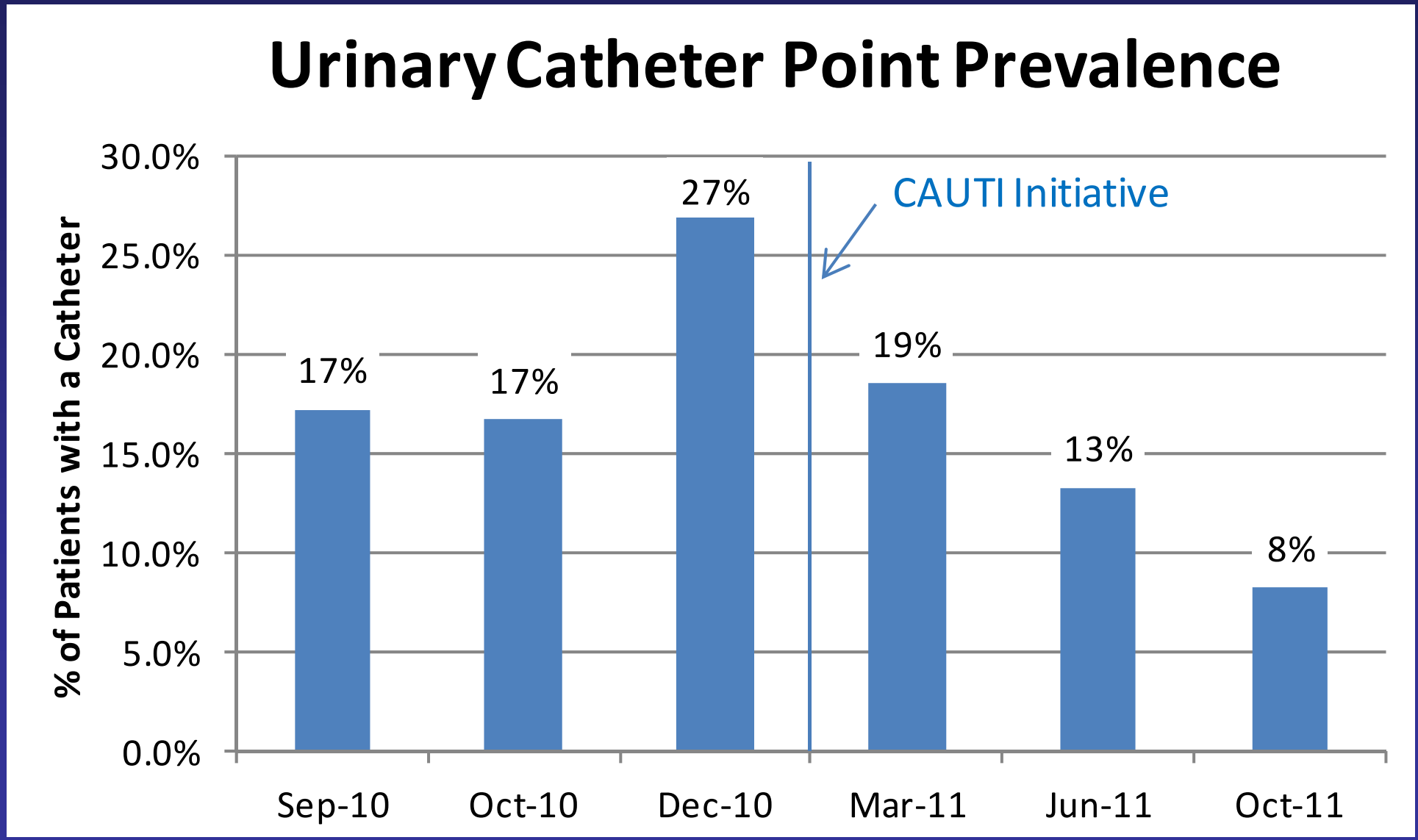
At Home

Across the State of Michigan

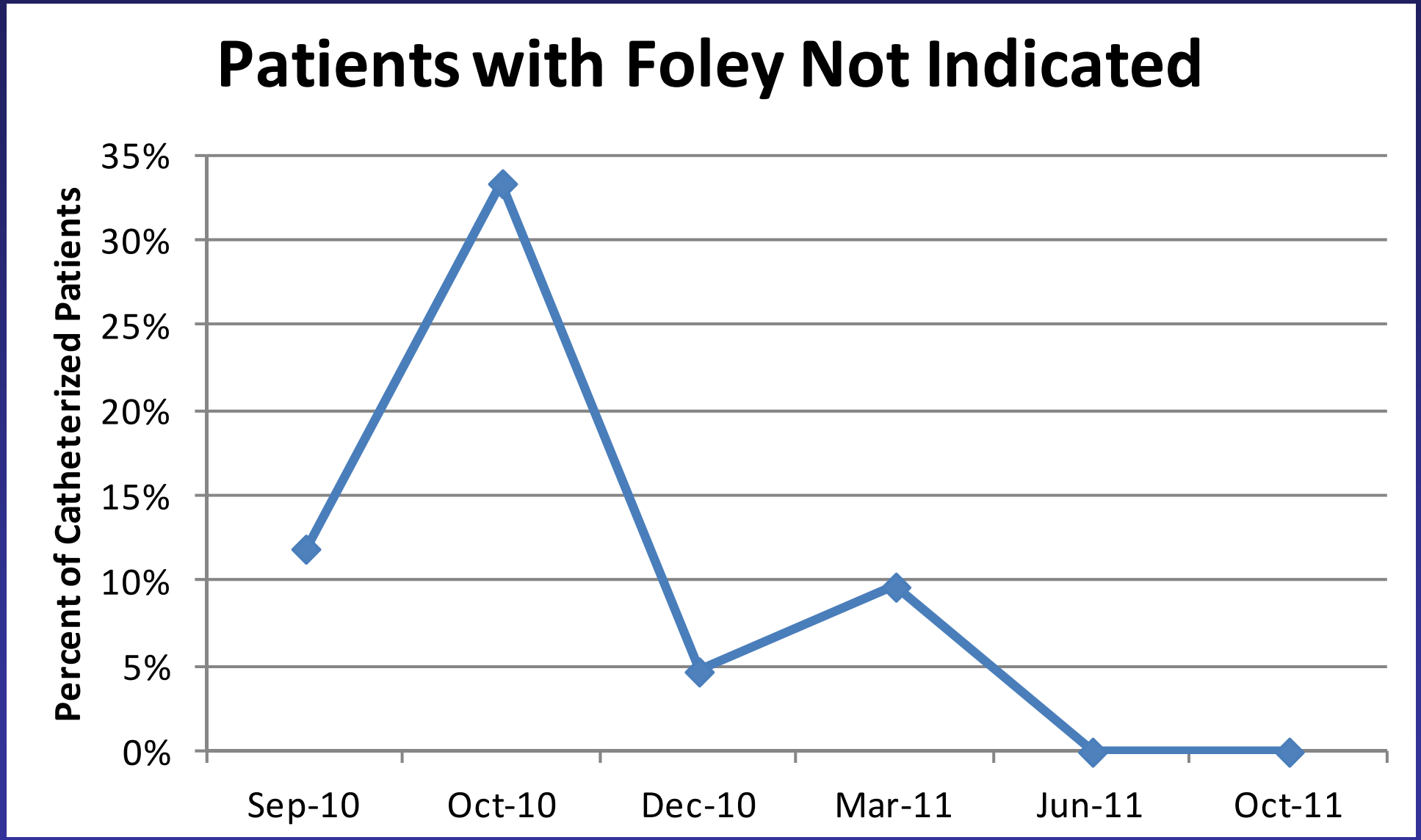
Hospital Outcomes Program of Excellence (HOPE)
(http://va-hope.org)

- Systems redesign grant to Ann Arbor VAMC
- Behavioral lab for interventions to improve quality and efficiency of care
- CAUTI prevention one of many initiatives: nurse-initiated reminder

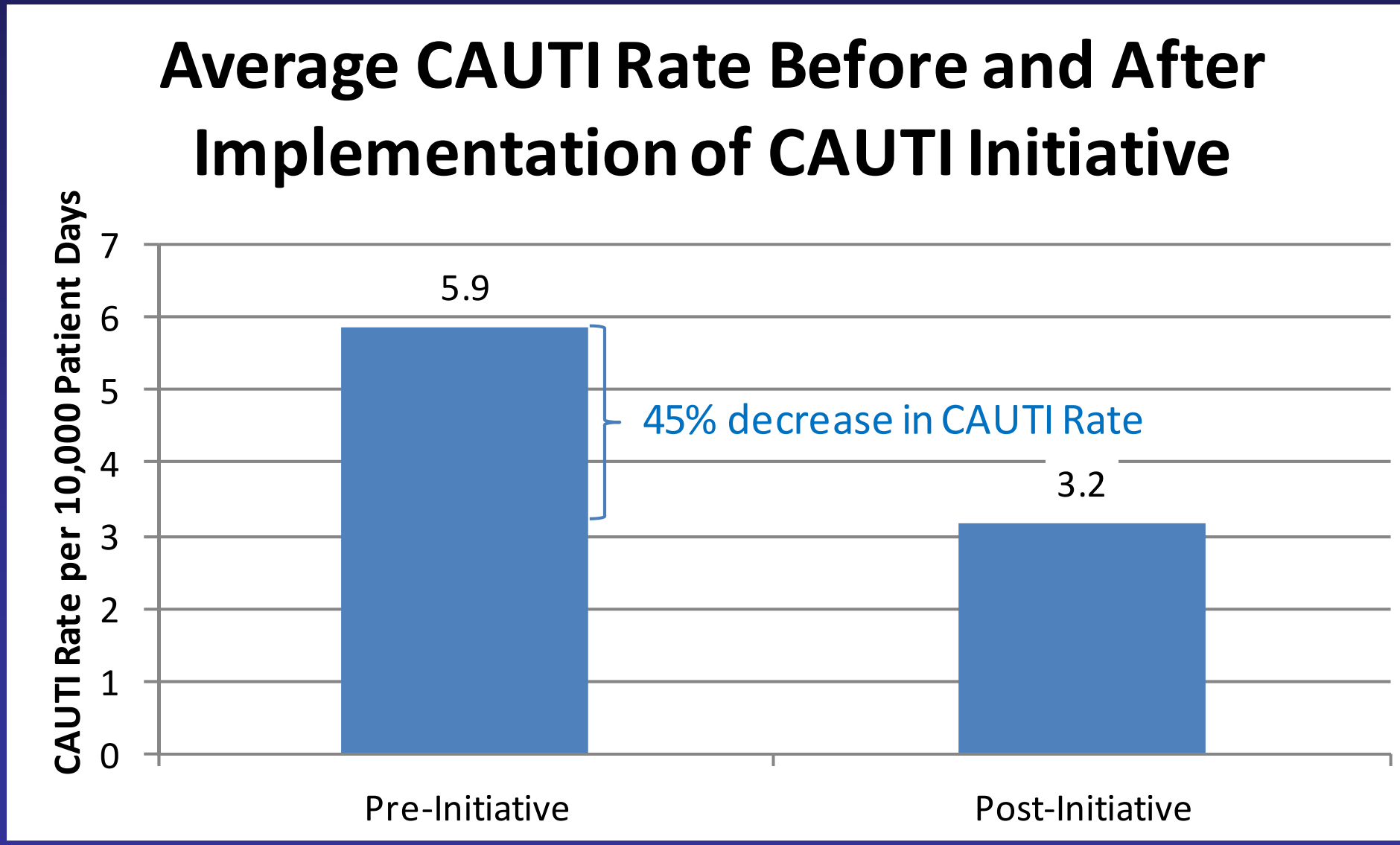
Prevalence of Urinary Catheters



Indication for Catheter Placement



CAUTI Rate


Average CAUTI Rate Before and After Implementation of CAUTI Initiative
CAUTI Rate per 10,000 Patient Days
0
1
2
3
4
5
6
7
5.9
3.2
45% decrease in CAUTI Rate
Pre-Initiative
Post-Initiative

Implementing Change

At Home

Across the State of Michigan

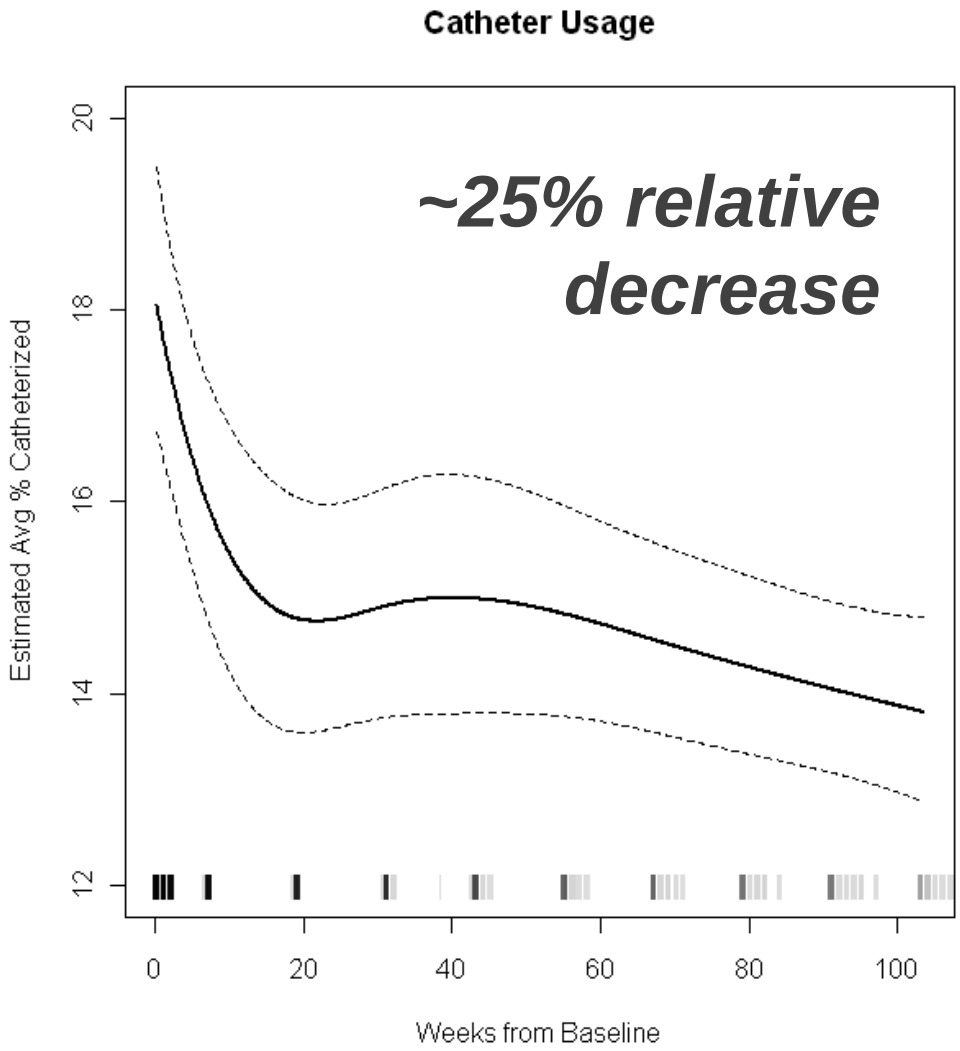
Reducing Inappropriate Urinary Catheter Use: A Statewide Effort

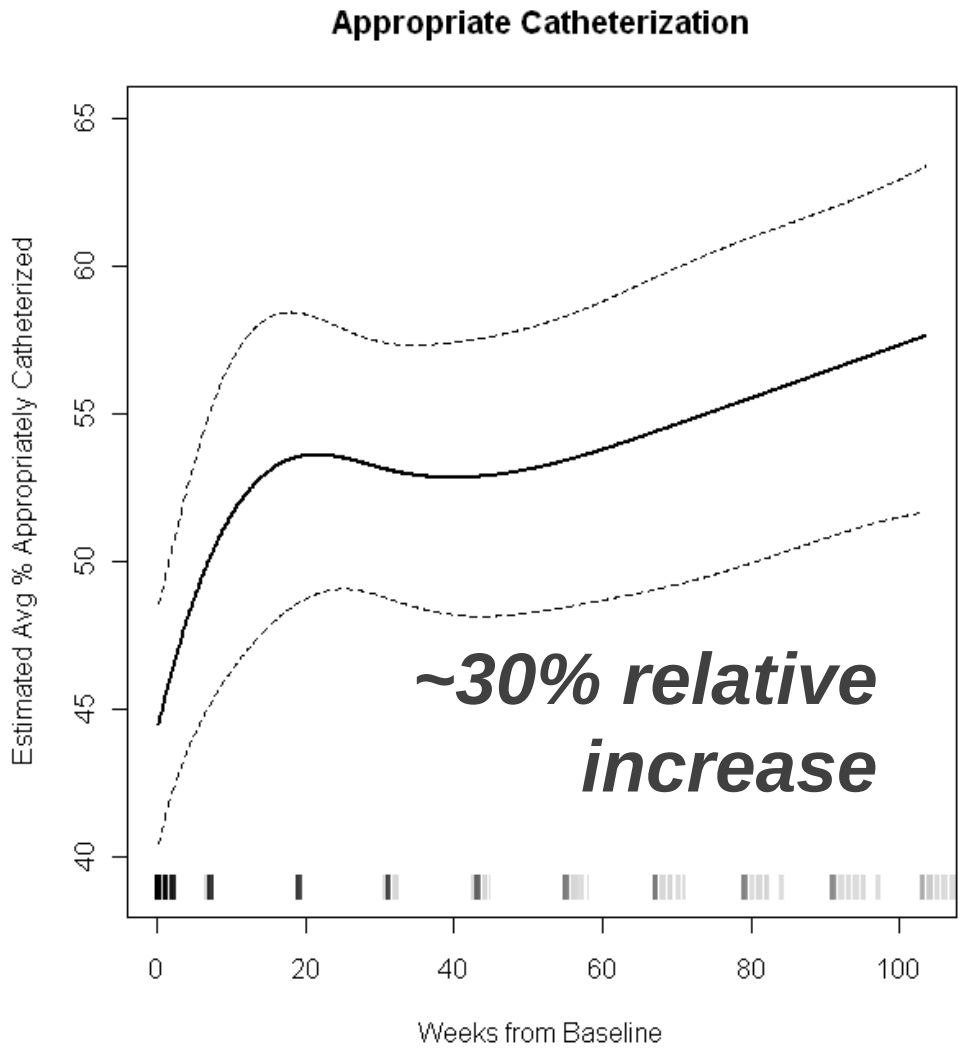
- Evaluate the effect of the Keystone Center's CAUTI Initiative in Michigan: "Bladder Bundle"
  - Nurse-initiated removal protocol using daily rounds: 45% reduction in unnecessary catheter utilization

(Fakih et al, Infect Control Hosp Epidemiol 2008)

- Study Period: 2007 to 2010
- 163 units in 71 participating Michigan hospitals

Foley Use in Michigan: 2007-2010





(Fakih et al. Arch Intern Med 2012)

Understanding Why Some Hospitals are Better than Others in Preventing Infection

- Mixed-methods national studies focusing on 3 healthcare-associated infections
- Phone interviews and site visits to hospitals across the U.S.
- Interviewed ~200 people at various levels

Much of the variability between hospitals is related to the people who work in those hospitals

Implementation

Technical

Socio-adaptive

Qualitative Themes from Michigan's CAUTI Experience: The Socio-Adaptive

- *Tailoring*
- *Workflow*
- *Leadership*

The Importance of Tailoring

- May need to tailor (ie, modify) your approach to CAUTI given your specific context and circumstances
- We saw different solutions at different hospitals; different solutions within different units at the same hospital
- Examples:
  - Who assesses for catheter appropriateness
  - Modifying the indications for catheter use (slightly)
  - Focus on insertion or early removal or both?

Qualitative UTI Themes from Michigan's CAUTI Experience: The Socio-Adaptive

- ✓ *Tailoring*
- *Workflow*
- *Leadership*

The Challenge: How to Make Urinary Catheter Removal Part of the Workflow

- The intervention(s) should become part of the workflow: both removal (floor) and insertion (ED)
- Nursing workload was a big issue - since Foleys can be easier for the nurses, this may be a disincentive to remove

The Challenge: How to Make Urinary Catheter Removal Part of the Workflow

- The intervention(s) should become part of the workflow: both removal (floor) and insertion (ED)
- Nursing workload was a big issue - since Foleys can be easier for the nurses, this may be a disincentive to remove
- For insertion, ED is paramount
  - Foleys put in for specimen collection and left in
  - ED nurses may think they're doing floor nurses a favor
  - Nursing aides often insert Foleys in the ED

Qualitative UTI Themes from Michigan's CAUTI Experience: The Socio-Adaptive

- ✓ *Tailoring*
- ✓ *Workflow*
- *Leadership*

The Importance of Leadership

- Leadership at various levels appears to be important, especially at the nurse manager level
- Physicians often play an important role
  - Behind-the-scenes (getting buy-in from medical executive committees and other physicians)
  - Front-line (eg, hospitalists, hospital epidemiologists)

The Importance of Leadership

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- Physicians often play an important role
  - Behind-the-scenes (getting buy-in from medical executive committees and other physicians)
  - Front-line (eg, hospitalists, hospital epidemiologists)
- The type of champion that is needed depends on organizational culture
  - Nurse manager or charge nurse may be best option
  - Not a one-size-fits-all strategy

4 Key Behaviors of Effective Infection Prevention Leaders

(Saint et al. Infect Cont Hosp Epid. Sept 2010)

1) Cultivated a culture of clinical excellence
   - Developed a clear vision
   - Successfully conveyed that to staff
2) Inspired staff
   - Motivated and energized followers
   - Some, not all, were charismatic

4 Key Behaviors of Effective Infection Prevention Leaders

(Saint et al. Infect Cont Hosp Epid. Sept 2010)

3) Solution-oriented

- Focused on overcoming barriers rather than complaining
- Dealt directly with resistant staff

4) Thought strategically while acting locally

- Planned ahead leaving little to chance; politicked before crucial issues came up for a vote in committees

Effective leaders also figure out how to engage the clinicians at their hospital.

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

The Physician Champion & Physician Supporters

Physician Supporters: Reasons for Them to Support the Champion (or Become One…)

Infectious Disease Specialists	Urologists
• Reduce CAUTI • Reduce antibiotic use • Reduce potential of increased resistance and *Clostridium difficile* disease	• Reduce trauma (mechanical complications): 1. Meatal and urethral injury 2. Hematuria
Hospitalists	**Geriatricians**
• Infectious and mechanical complications • Potential catheter complications prolonging length of stay • Often salaried physicians with incentives based on hospital-based quality and efficiency	• Many elderly are frail • Urinary catheters are placed more commonly in elderly inappropriately • Urinary catheters increase immobility and deconditioning

Physician Supporters: Reasons for Them to Support the Champion (or Become One…)

Rehabilitation Specialists	Surgeons
• The urinary catheter reduces mobility in patients: “one-point restraint” • Rapid recovery (improvement in ambulation) may be hampered by the catheter	• Surgical Care Improvement Project: Remove catheters by postop day 1 or 2 • Inappropriate urinary catheter use may negatively affect the surgeon’s profile • Risk of infection and trauma related to the catheter
Intensivists	**Emergency Medicine physicians**
• Intensivists can support the evaluation of catheter need before transfer out of the ICU	• Up to half of the patients are admitted through the emergency department (ED) • Inappropriate urinary catheter placement is common in the ED • Promoting appropriate placement of urinary catheters in the ED will reduce inappropriate use hospital-wide

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

Nursing Workload

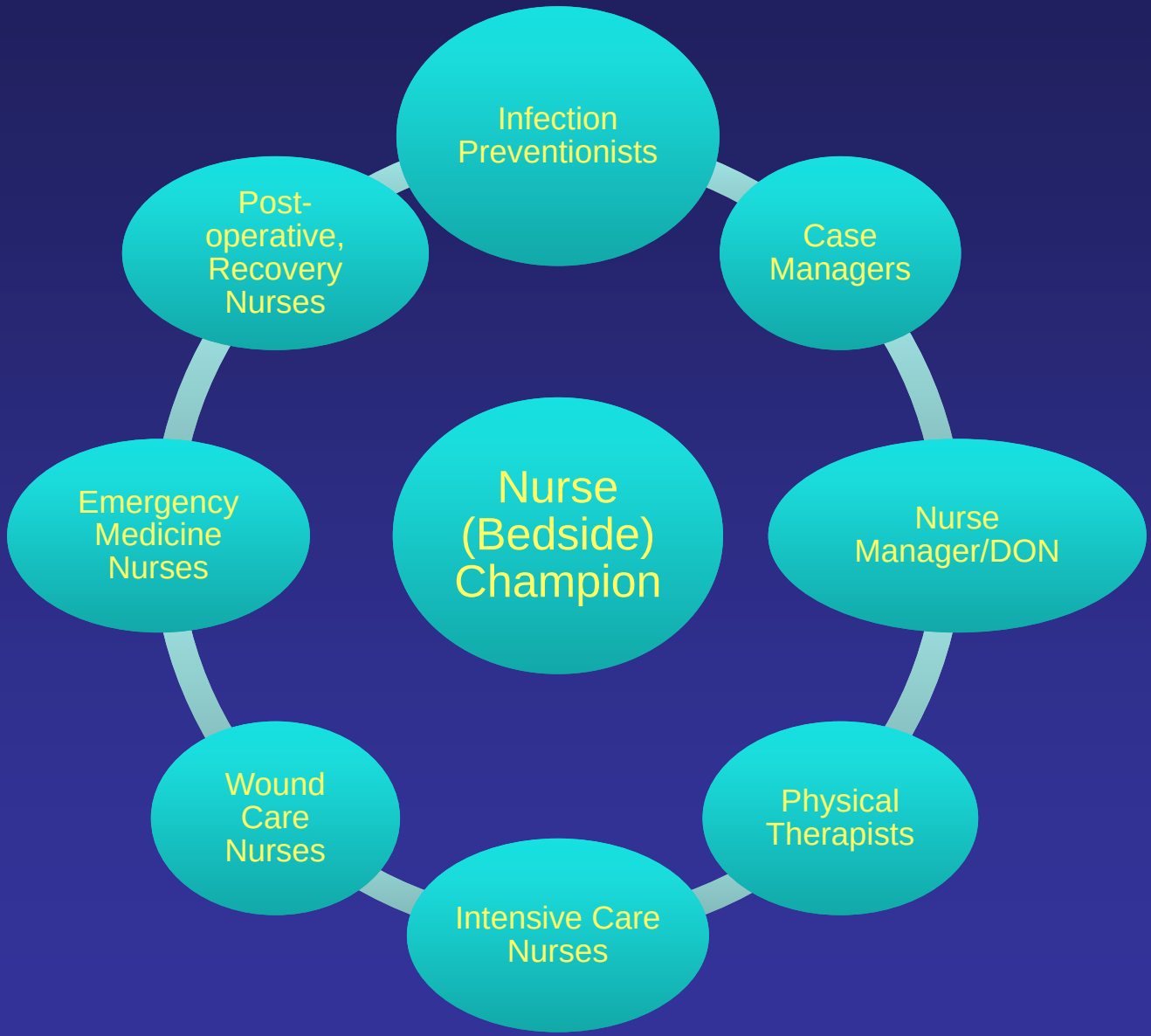
- A nurse: "…convenience unfortunately is a high priority …especially with urinary catheters…the workload will be increased if you have to take [patients] to the bathroom or you have to change their bed a little more often …."

(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!

The Bedside Nurse…and Supporters



Nurse Supporters: Reasons for Them to Support the Champion

Infection preventionists	Case managers
• Reduce CAUTI • Reduce antibiotic use • Reduce potential of increased resistance and *Clostridium difficile* disease	• Less complications (mechanical or infectious) = lower cost • Early removal of catheter may reduce length of stay
Nurse manager/Director of Nursing (DON)	**Physical therapists**
• Leader and supporter to the bedside nurse • Makes appropriate urinary catheter use a priority and a safety issue • Helps to address any barriers encountered by the bedside nurse	• The urinary catheter reduces mobility in patients: “one-point restraint” • Rapid recovery (improvement in ambulation) may be hampered by the catheter

Nurse Supporters: Reasons for Them to Support the Champion

Intensive care unit (ICU) nurses	Wound care nurses
• A significant opportunity is present upon transfer from the ICU to discontinue no longer needed urinary catheters • ICU nurse may evaluate catheter need before transfer out of the unit and discontinue unnecessary catheters	• Urinary catheter use increases immobility, which in turn results in an increased risk of pressure ulcers • Wound care nurses may help in advising the bedside nurse on methods to reduce skin breakdown in patients with incontinence without using urinary catheters
Emergency medicine nurse	**Post-operative recovery nurses**
• Up to half of the patients are admitted through the emergency department (ED) • Inappropriate urinary catheter placement is common in the ED • Promoting appropriate placement of urinary catheters in the ED will reduce inappropriate use hospital-wide	• Urinary catheters are commonly placed preoperatively for fluid management • Post-operative recovery nurses evaluate the catheter for continued need and promptly remove unnecessary catheters

Putting it All Together: Key Roles and Responsibilities

Role or Responsibility	Example of Personnel to Consider
Project coordinator	Infection preventionist, Quality manager, Nurse manager
Nurse champion (engage nursing personnel)	Nurse manager, charge nurse, staff nurse, nurse educator
Physician champion (engage medical personnel)	Urologist, ID physician, hospital epidemiologist, hospitalist
Data collection, monitoring, reporting	Infection preventionist, Quality manager, Utilization manager

(Modified from www.catheterout.org)

Conclusion

Preventing Catheter-Associated UTI is a Team Sport!

Thank you!

Building a Team and a Process to Reduce CAUTI Risk

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ON THE CUSP: STOP HAI

Learning Objectives

1. Describe what is needed to build a team to reduce CAUTI risk
   - Determine the essential members
   - State what is expected from them
2. Explain the process to reduce CAUTI risk
   - Know the approved indications for catheter use
   - Understand how to implement and sustain a process to evaluate appropriate catheter use

ON THE CUSP: STOP HAI

Building a Successful Team: Why are we doing this?

Two Goals for the CAUTI Collaborative:

1. Improve the culture of safety on your unit through the Comprehensive Unit-based Safety Program (CUSP)
2. Reduce your unit's CAUTI rate by 25%

Both goals require strong commitment at the organizational leadership and unit level!

ON THE CUSP: STOP HAI

Building a Successful Team: Must be Multidisciplinary

- **Required:**
  - Team Leader
  - Nurse Champion
  - Physician Champion
  - Executive Partner
  - Front-line Nurses
  - Infection Preventionist
- **Optional:** case managers/discharge planners, etc.

Building a Successful Team: **The Team Leader**

- **Ideal Characteristics:**
  - Opinion leader, with demonstrated commitment to patient safety
  - Team player, respected by others, empowered by leadership
  - Strong organizational, management, and communication skills
- **Role Expectations**
  - Recruit team members and define team roles
  - Understand and clearly articulate project goals
  - Delegate tasks and hold others accountable
  - Lead team meetings and participate in collaborative activities to meet project requirements
  - Track project progress

Building a Successful Team: **The Team Leader**

- **Specific Tasks:**
  - **Explain** project to unit staff and management team
  - **CAUTI reduction**:
    - Ensure staff education about CAUTI and appropriate indications for catheter use
    - Facilitate the development of a process to review the appropriateness of catheter use
  - **CUSP implementation**:
    - Ensure staff education about patient safety
    - Use CUSP tools to improve teamwork/patient safety

Building a Successful Team: **The Team Leader**

- **Specific Tasks, continued:**
  - **Data:**
    - Be very familiar with the data collection schedule
    - Ensure timely collection and submission for:
      - Readiness Assessment and HSOPS
      - Outcome and Process Data
      - Team Checkup Tools
  - **Sustainability:**
    - Support the integration of CUSP/CAUTI into daily workflow and unit operations

Building a Successful Team: **The Nurse Champion**

- **Expectations/Tasks:**
  - Responsible for facilitating the education of other nurses
  - Develops and shares expertise in
    - technical skills to reduce CAUTI
    - adaptive work of the CUSP model to improve teamwork and patient safety on that unit
  - Promotes the goals and interventions of the project both on the unit and within the larger organization
  - Serves as a role model for nurse empowerment

Building a Successful Team: **The Nurse Champion**

- **Ideal Characteristics:**
  - Strong organizational/management/and communication skills
  - Know to have a strong commitment to patient safety
  - Respected by peers; advocates on behalf of nurses
  - Has good rapport with the medical staff
  - Preferably from that unit: nurse manager, charge nurse, nurse educator, or frontline nurse
  - Optional, but less desirable: nurse from organization at large:
    - quality improvement professional
    - infection prevention professional

Building a Successful Team: **The Physician Champion**

- **Expectations/Tasks:**
  - Responsible for the education of medical staff about the appropriate indications for urinary catheter use
  - Serves as the liaison to promote the goals and interventions of the project to unit medical staff and hospital medical staff
  - Actively works with the team and other physicians to develop and implement strategies to remove identified physician barriers

Building a Successful Team: **The Physician Champion**

- **Ideal Characteristics:**
  - Strong communication and quality improvement skills
  - Empowered by leadership
  - Respected by medical staff peers and nursing staff
  - Demonstrates a spirit of collegiality to all team members
  - Possible choices: Urologist, infectious disease specialist, hospitalist, quality/patient safety officer or any physician interested in improving safety and quality

Building a Successful Team: **The Executive Partner**

- **Expectations/Tasks:**
  - Advocate for the project goals and the team with other senior leadership and the Board
  - Meet regularly with the team to review data/progress
  - Assist the team with prioritization of safety defects
  - Facilitate removal of barriers
  - Share the project's progress with senior leadership and the Board

Building a Successful Team: **The Executive Partner**

- **Ideal Characteristics:**
  - Strong communication skills
  - Approachable and willing to commit time
  - Strong commitment to patient safety/quality improvement
  - Respected by peers and others with commitment to safety
  - Potential candidates include: CMO, CNO, Chief Quality or Patient Safety Officer

Building a Successful Team: **Front-Line Nurses**

- **Expectations/Tasks:**
  - Responsible for inspiring the commitment of other nurses on the unit to the project goals
  - Help to educate peers formally and by example
  - Help the team identify practical ways to:
    - ensure proper catheter insertion and maintenance
    - achieve daily assessment of catheter necessity
    - improve teamwork with physicians and other staff
    - make the unit safer for patients

Building a Successful Team: **Front-Line Nurses**

- **Ideal Characteristics:**
  - Strong teamwork and communication skills
  - Strong commitment to patient safety
  - Sufficient experience/tenure on that unit
  - Respected by peers on the unit
  - Practical, flexible, willing to speak up
  - Not intimidated by medical staff

Building a Successful Team: **Infection Preventionist**

- **Expectations/Tasks:**
  - Meet regularly with the team to review data/progress
  - Often may be the person responsible for data collection and/or data entry
  - Serve as the "content expert" or infection prevention consultant to the team
  - Help the team develop/implement/monitor appropriate infection prevention strategies
  - Communicate the project goals and progress as appropriate in infection prevention meetings and other settings within the hospital

Building a Successful Team: **Infection Preventionist**

- **Ideal Characteristics:**
  - Team player with good communication skills
  - Knowledgeable about:
    - CAUTI definitions
    - HICPAC guidelines
    - Evidence-based infection prevention practices regarding catheter use

Summary: Before Starting…

- Do you have commitment from your leadership?
- Have you shared the project goals within your unit and your organization?
- Are you ready to:
  - build a multidisciplinary team?
  - communicate the technical work/changes needed to stakeholders (nurses and physicians)?
  - build a rounding process to check for catheter appropriateness?
  - commit to regular data submission and review ?

Summary: To be Successful…

To achieve BOTH project goals of improving your unit safety culture and reducing CAUTI's you will need:

- A multidisciplinary, *unit level* team
- Strong backing from organizational leadership
- A respected and effective team leader
- A committed physician and nursing champion
- Nursing AND physician ownership of the work to make care safer for patients

Indications for Catheter Use

Appropriate and inappropriate indications for urinary catheter use are based on the new CDC HICPAC guidelines 2009

2009 Prevention of CAUTI HICPAC Guidelines

(Gould et al, Infect Control Hosp Epidemiol 2010; 31: 319-326)

Table 2. **A. Examples of Appropriate Indications for Indwelling Urethral Catheter Use** [1-4]
Patient has acute urinary retention or bladder outlet obstruction
Need for accurate measurements of urinary output in critically ill patients
Perioperative use for selected surgical procedures: • Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract • Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU) • Patients anticipated to receive large-volume infusions or diuretics during surgery • Need for intraoperative monitoring of urinary output
To assist in healing of open sacral or perineal wounds in incontinent patients
Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)
To improve comfort for end of life care if needed
B. Examples of *Inappropriate* Uses of Indwelling Catheters
As a substitute for nursing care of the patient or resident with incontinence
As a means of obtaining urine for culture or other diagnostic tests when the patient can voluntarily void
For prolonged postoperative duration without appropriate indications (e.g., structural repair of urethra or contiguous structures, prolonged effect of epidural anaesthesia, etc.)

Note: These indications are based primarily on expert consensus.

Other Acceptable Indications?

- May consider including certain institutionally - acceptable reasons for use
- Caution: not to have acceptable indications to fit your current practice at the facility

Other Acceptable Indications?

- A more helpful approach would be to have more clarity established at your institution on what each of the indications means

Accurate measurement of urinary output in the critically ill patients

- We see this indication applicable to patients in the intensive care setting
- Clearly define who is critically ill when you establish your acceptable indications

Acute Urinary Retention or Obstruction

Outflow Obstruction	Acute Urinary Retention
Prostatic hypertrophy with obstruction	Medication-induced
Urethral obstruction	Medical (neurogenic bladder)
Urinary blood clots with obstruction	Trauma to spinal cord

Perioperative Use in Selected Surgeries

Intraoperative	Anticipated prolonged duration of surgery, large volume infusions during surgery, or need for intraoperative urinary output monitoring
Surgical Site	Urologic surgery or other surgery on contiguous structures of the genitourinary tract

Perioperative Use in Selected Surgeries

- NOTE: Spinal or epidural anesthesia may lead to urinary retention (prompt discontinuation of this type of anesthesia should prevent need for urinary catheter placement)
- The goal is to remove the catheter shortly after the surgery is completed

Assist Healing of Perineal and Sacral Wounds in Incontinent Patients

- This is an indication when there is concern that urinary incontinence is leading to worsening skin integrity in areas where there is skin breakdown.

Hospice/Comfort Care/Palliative Care

- Patient comfort at end-of-life: depends on what the patient perceives as more comfortable

Required Immobilization for Trauma or Surgery

Examples include:

1. Unstable thoracic or lumbar spine
2. Multiple traumatic injuries, such as pelvic fractures

Chronic indwelling urinary catheter

- Defined as present for >30 days
- It is not infrequent to see patients admitted from extended care facilities with a chronic urinary catheter without being able to find the reason for initial placement when assessed. We suggest that these patients represent a special category and may need a different assessment for the appropriateness of catheterization. We consider them to have an acceptable use till further evaluation is done.

Unacceptable Reasons for Placement

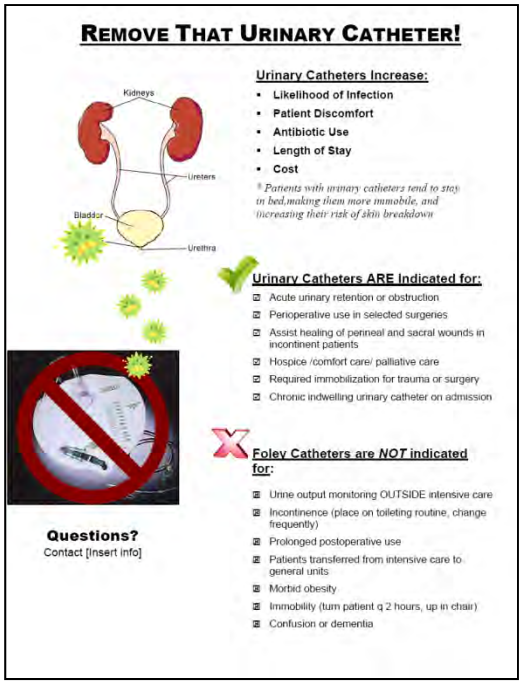
- Urine output monitoring OUTSIDE the intensive care unit (e.g., congestive heart failure receiving diuretics)
- Incontinence without sacral or perineal pressure sore
- Prolonged postoperative use
- Others (include those transferred from intensive care, morbid obesity, immobility, confusion or dementia, and patient request)
- Clearly define all of the indications to avoid using the catheter inappropriately

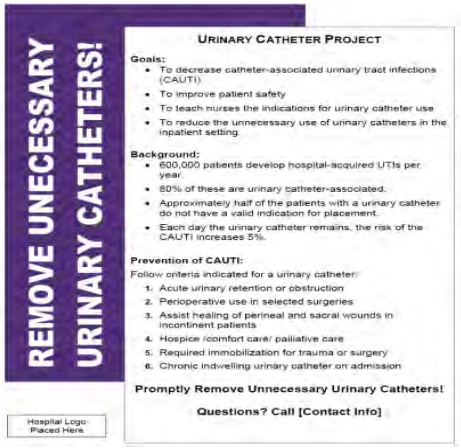
Creating a Process to Evaluate Urinary Catheter Need

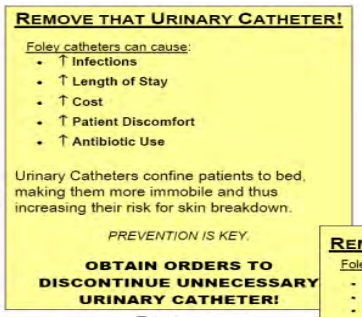
- Educate nursing staff on appropriate urinary catheter utilization
- This may include providing them with printed educational material, lectures, posters, pocket cards
- The most important education occurs during rounds where the healthcare worker champion discusses the appropriate indications for urinary catheter use with the nurses

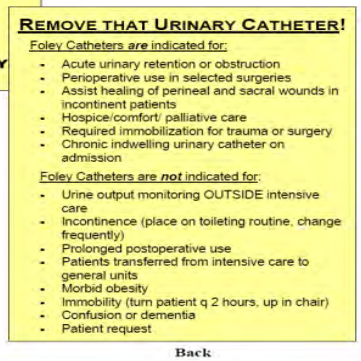
Tools Used with Intervention

- Lecture for nurses
- Pocket cards, posters







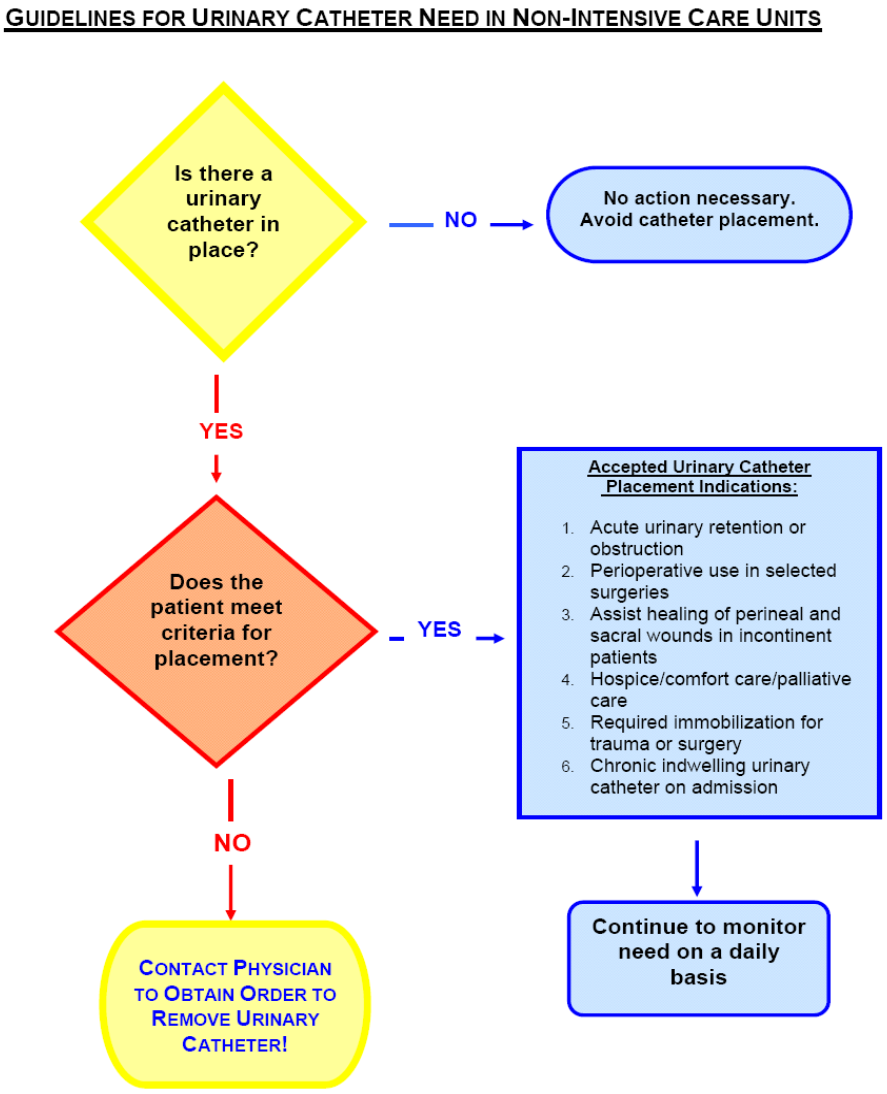


Creating a Process to Evaluate Urinary Catheter Need

- A healthcare worker champion (usually a nurse, alternatively an infection preventionist, or quality improvement healthcare worker who is knowledgeable of indications for urinary catheter utilization) participates in daily nursing rounds
- Members of nursing rounds may include:
    1. Nurse Manager (or charge nurse)
    2. Case Manager (or discharge planner)
    3. Social Worker
    4. Bedside nurses assigned to patients

Main Education is Performed during Nursing Rounds

- Does the patient have a urinary catheter
- Reason for catheter use
- If no appropriate indication, the patient nurse will contact the physician to discontinue the urinary catheter
- This process will be continued after implementation with the patient's nurse owning the process



Creating a Process to Evaluate Urinary Catheter Need

- Key Factor for Success: a nurse manager who supports this initiative and holds the nursing staff accountable for removing non-indicated urinary catheter
- Each unit needs to have a facilitator who will take the responsibility to reinforce the process after the initial intervention is completed to ensure sustainability
- Potential facilitators include a unit nurse champion with interest in patient safety or the charge nurse

Creating a Process to Evaluate Urinary Catheter Need

- The patient's bedside nurse will be coached to own the process of evaluating whether the patient has a urinary catheter placed, and to evaluate the need for the catheter
- The bedside nurse should note the catheter's presence and evaluate the indication during the patient's daily nursing assessment. This will be continued after implementation
- The process may be enforced by integrating it into the patient's daily nursing assessment

Addressing Barriers to Implementation

- Provide solutions to barriers
- Encourage the use of facilitators to make the process easier
- Examples:
  1. Skin care in the incontinent
  2. Using weight for patients that require close fluid monitoring

What if There Are No Nursing Rounds? Options?

1. The nurse champion discusses with each nurse on the unit the presence and need of the catheter
2. Alternatively, nurse champion and mid level provider may round on patients to evaluate presence, need, and discontinue catheter if no need

What if There Are No Nursing Rounds? Options?

3. Recognition of catheter presence, and evaluation of need as soon as the patient is admitted to the unit (whether from ED, OR, ICU, or different non-ICU)
4. Partnering with other stakeholders (case managers, physical therapists, wound care nurses, infection preventionists) to prioritize the importance of addressing the urinary catheter need

Important Issues

- A continued reduction in urinary catheter utilization may be a marker of the program's success
- The risk of urinary tract infection increases the longer the urinary catheter is present. A single patient who has a urinary catheter placed without indication for a prolonged period of time may affect your effort significantly

Important Issues, continued

- ICUs have a high prevalence of urinary catheter utilization. Utilization may be significantly reduced on the general medical-surgical units if patients transferred out of the ICUs are evaluated for catheter necessity
- The emergency department and the operating room are areas where a large number of urinary catheters are placed. Addressing the appropriateness of placement of urinary catheters in the emergency department and promoting removal of the urinary catheters post-operatively in the recovery area may also help reduce unnecessary urinary catheter use

How to Get Successful Results

- Both nurses and physicians should evaluate the indications for urinary catheter utilization
- Physicians should promptly discontinue catheters when no longer needed
- Nurses evaluating catheters and finding no indication should contact the physician to promptly discontinue the catheter
- Partner with different disciplines (e.g., case management, nursing, infection prevention) to successfully achieve your goals

How to Sustain Your Success

- Identify unit champions to promote the need to evaluate the appropriateness of urinary catheter use
- Incorporate the following questions during nursing rounds:
  - Does the patient have a urinary catheter?
  - What is the reason for use?
- Provide feedback on performance to nurse managers related to prevalence of utilization
- If no improvement in utilization is seen, evaluate appropriateness of utilization (indications vs. non-indications)
- The long term goal is for the patient care nurses to own the process of evaluation of urinary catheter need

And the Nurses Own the Catheter…

	Bedside nurses (n = 229)
Who on unit is responsible to verify if a urinary catheter is needed?	
Nurse caring for patient	78/227 (34.4)
Case manager	4/227 (1.8)
Nurse manager	1/227 (0.4)
Nurse caring for patient and case manager	36/227 (15.9)
Nurse caring for patient, case manager, and nurse manager	108/227 (47.6)
How often does the nursing unit evaluate urinary catheter presence and appropriate need?	
Once per week	2/227 (0.9)
Tuesday and Thursday only	19/227 (8.4)
3 times per week	0/227
4 times a week	1/227 (0.4)
Daily	205/227 (90.3)
Evaluating the urinary catheter presence and need is usually done during…	
Morning shift	38/228 (16.7)
Night shift	0/228
All shifts	190/228 (83.3)

Fakih, Am J Infect Control 2013; 41: 236-239

And the Nurses Own the Catheter…

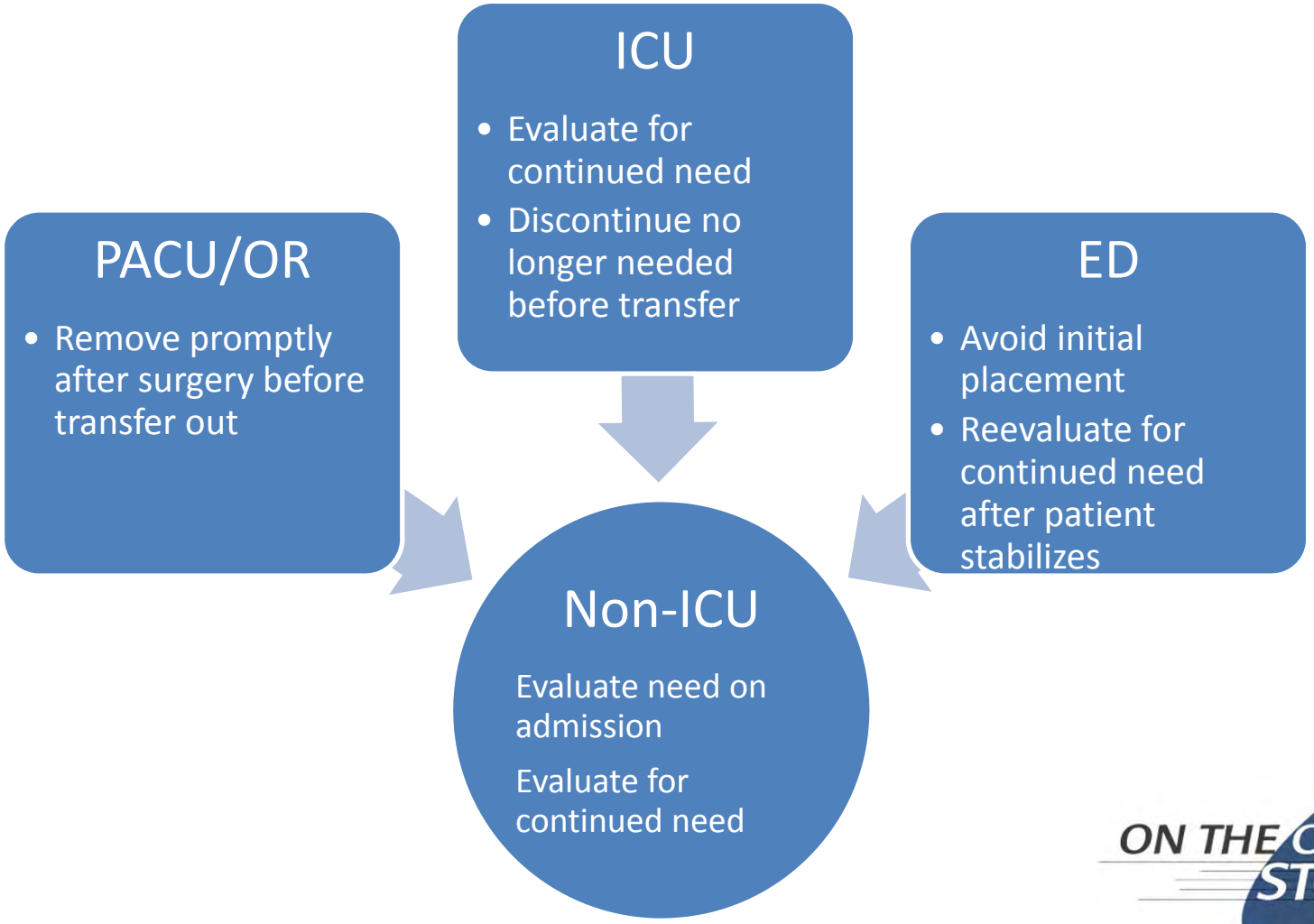
Multidisciplinary rounds help identify and remove no longer needed urinary catheters	
Strongly agree and agree	190/228 (83.3)
Neutral	28/228 (12.3)
Disagree and strongly disagree	10/228 (4.4)
Doing urinary catheter prevalence evaluations on Tuesdays and Thursdays helps our unit focus on removal of unnecessary catheters	
Strongly agree and agree	151/225 (67.1)
Neutral	56/225 (24.9)
Disagree and strongly disagree	18/225 (8)
I am confident in my knowledge of urinary catheter indications and nonindications	
Strongly agree and agree	223/229 (97.4)
Neutral	4/229 (1.7)
Disagree and strongly disagree	2/229 (0.9)

Fakih, Am J Infect Control 2013; 41: 236-239

Additional Areas to Address

- Leadership support is crucial
- Define barriers to implementation
- Obtain physician and nursing buy-in
- Provide alternatives to the “Foley” catheter

Think about the whole picture: areas to address



Thank you!

Questions?

Funding

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Preventing CAUTI: Engaging Clinicians and Senior Leadership to Implement Change

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ON THE CUSP: STOP HAI

Learning Objectives

- Describe the methods to engage clinicians in CAUTI prevention
- Describe methods to engage leadership in CAUTI prevention
- Employ the CAUTI cost calculator
- Identify future directions for implementing change

Healthcare-Associated Infection

- At least 20% of episodes are preventable; perhaps up to 70%

  (Harbath et al. J Hosp Infect 2003; Umscheid et al. ICHE 2011)

- Preventive practices are variably used
- Infections due to devices are especially common and preventable
- Implementing change within hospitals and within specific units is often challenging

"The hospital is the most complex human organization ever devised…"

- Peter Drucker

Hand Hygiene Compliance in Healthcare Workers

- 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%)

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

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. Implemetation Science. Feb 2006)

Implementation

Technical

Socio-adaptive

Catheter-Associated Urinary Tract Infection (CAUTI)

- UTI is a common cause of hospital-acquired infection
- Most due to urinary catheters
- Up to 25% of inpatients are catheterized
- Leads to increased morbidity and healthcare costs

www.catheterout.org

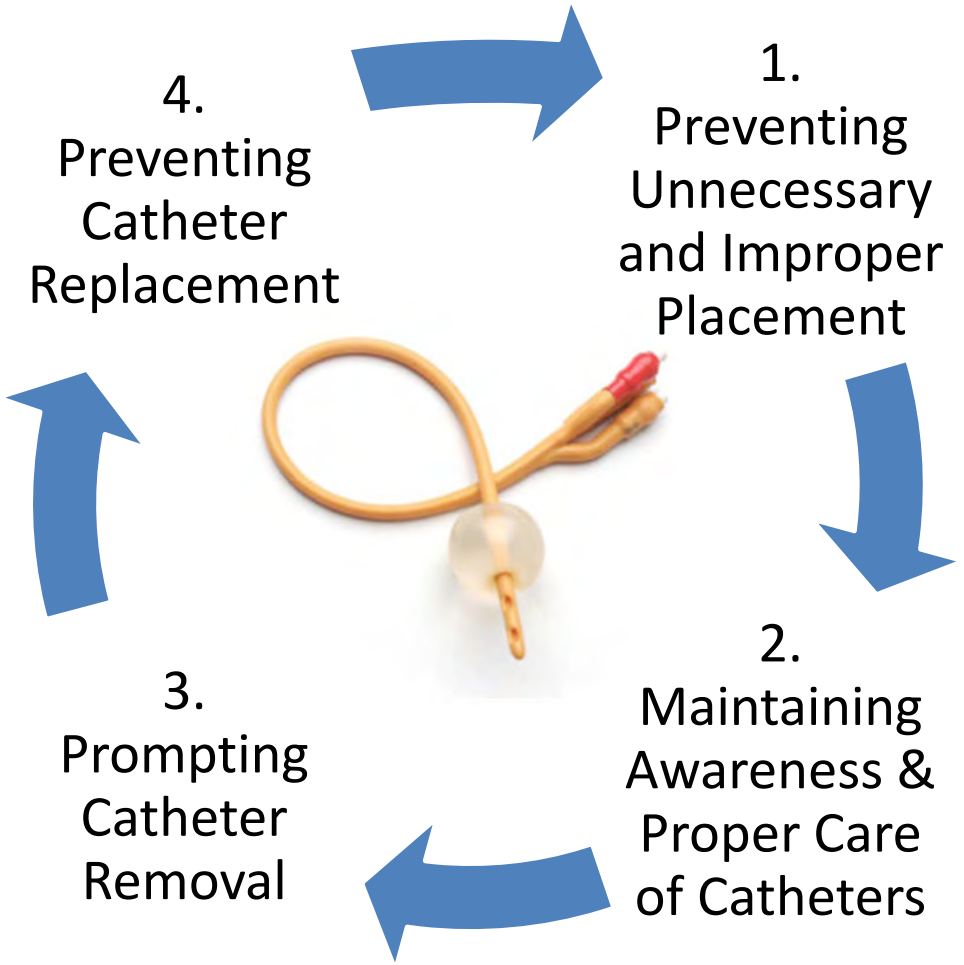
The Indwelling Urinary Catheter: A "1-Point" Restraint?

Satisfaction survey of 100 catheterized VA patients:

- 42% found the indwelling catheter to be uncomfortable
- 48% stated that it was painful
- 61% noted that it restricted their ADLs
- 2 patients provided unsolicited comments that their catheter "hurt like hell"

(Saint et al. JAGS 1999)

Disrupting the Lifecycle of the Urinary Catheter



(Meddings & Saint, Clin Infect Dis 2011)

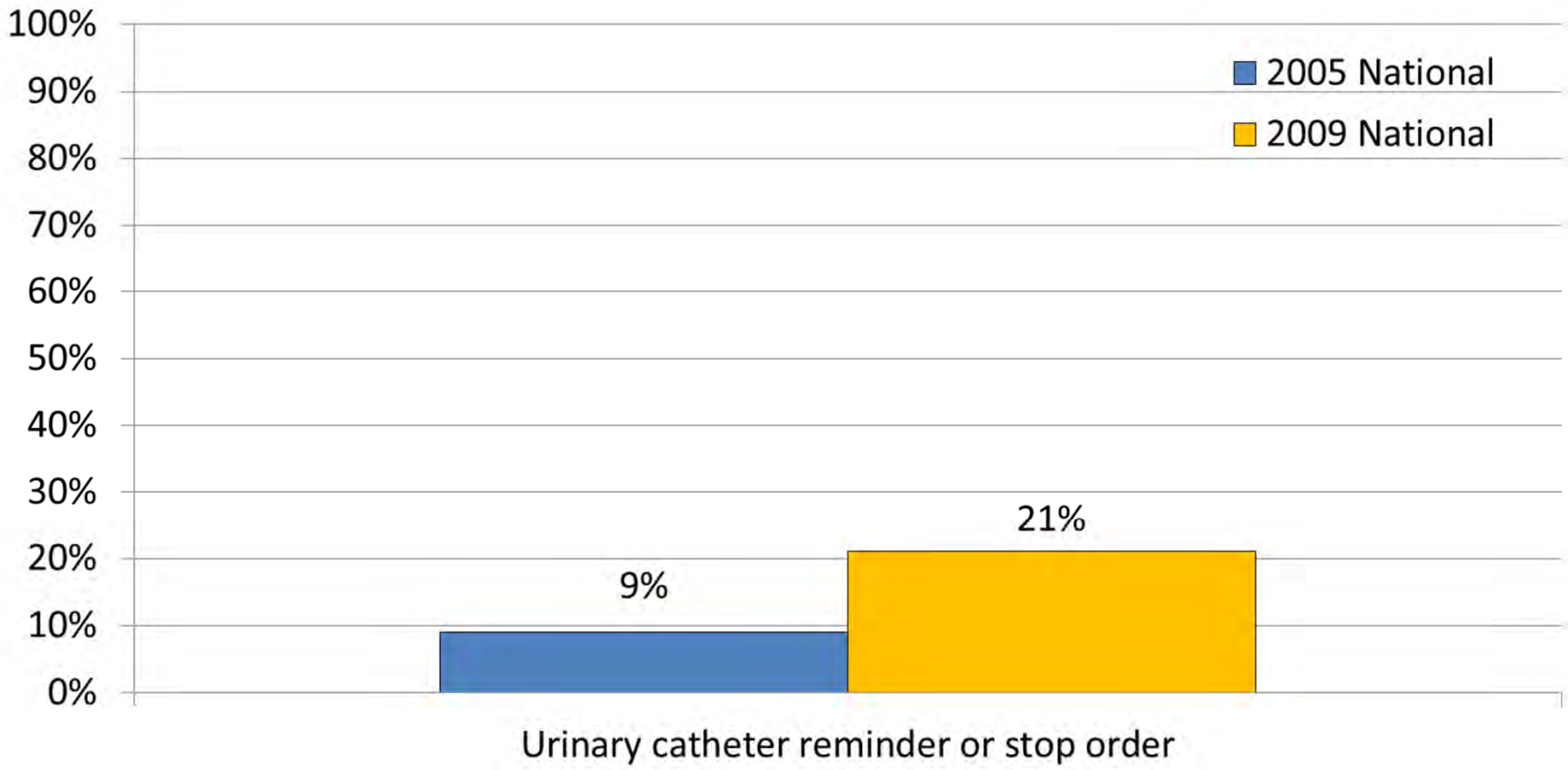
A Systems (and Technical) Solution: Timely Removal of Indwelling Catheters

- 14 studies have evaluated urinary catheter reminders and stop-orders (written, computerized, nurse-initiated)
  - Significant reduction in catheter use (~2.5 days)
  - Significant reduction in infection (~50%)
  - No evidence of harm (ie, re-insertion)

(Meddings J et al. Clin Infect Dis 2010)

Regularly Using to Prevent CAUTI: 2005 vs. 2009

(Krein et al. J Gen Intern Med. 2012)



Implementing Change

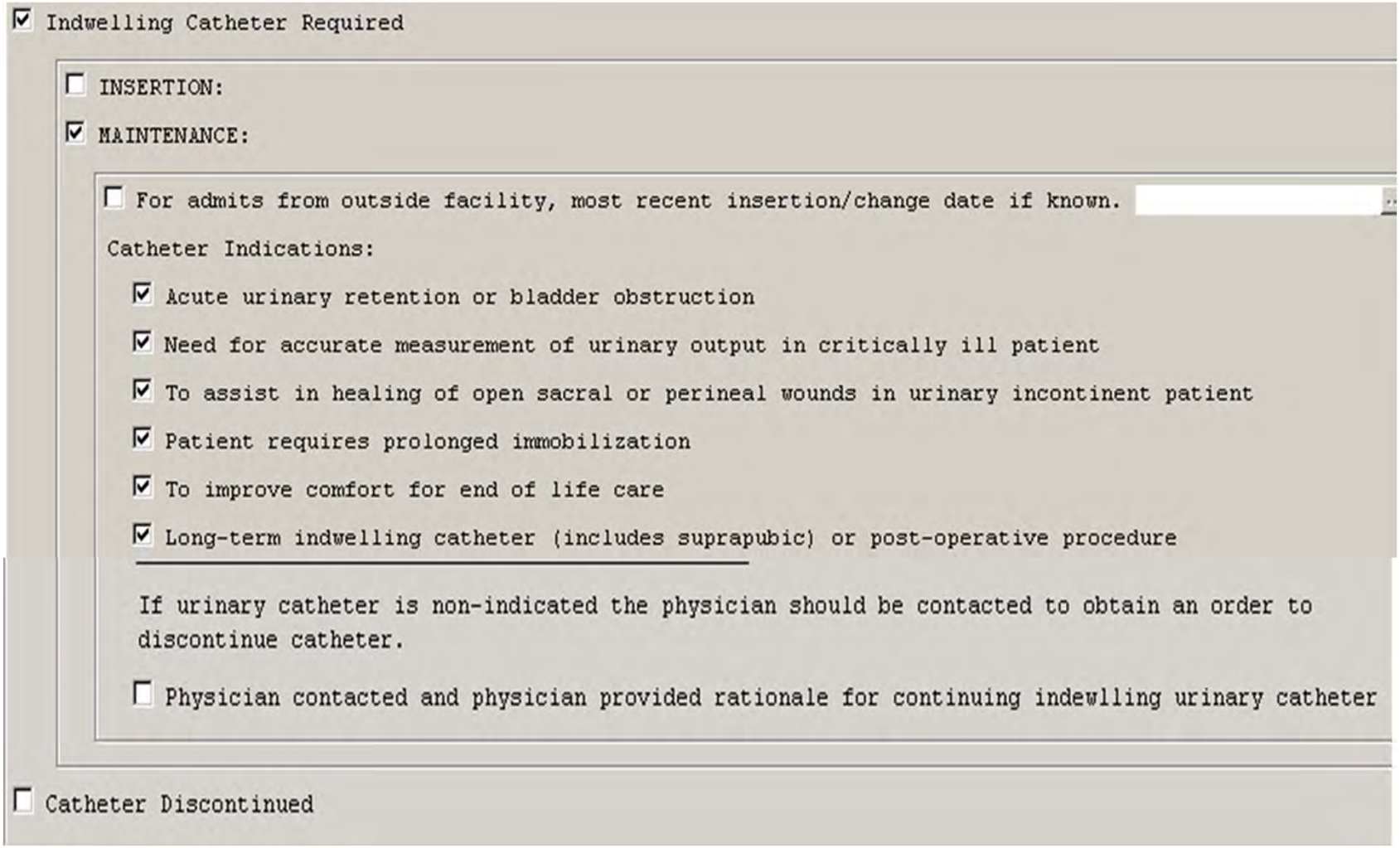
At Home

Across the State of Michigan

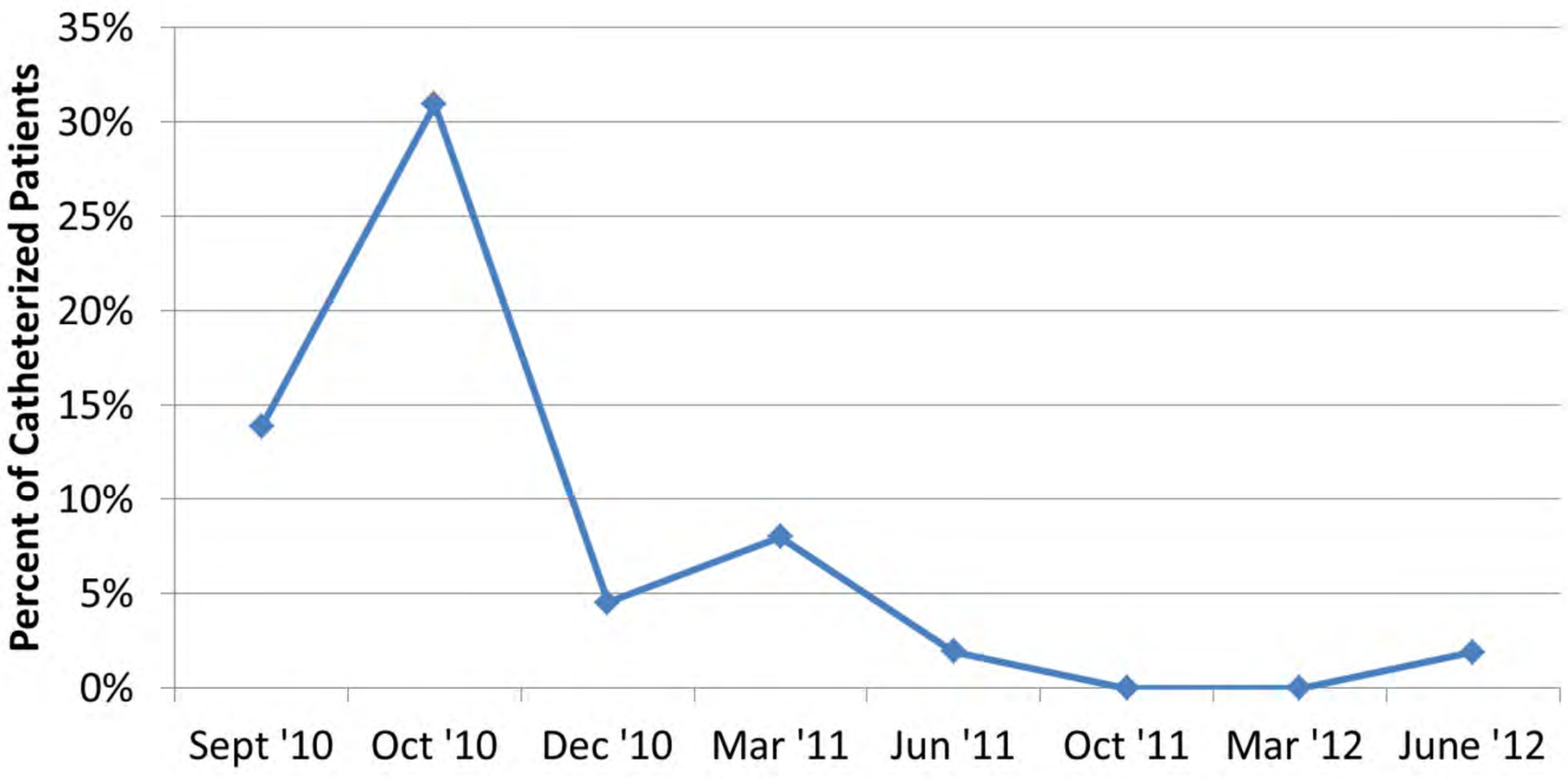
Hospital Outcomes Program of Excellence (HOPE) (http://va-hope.org)

- Systems redesign grant to Ann Arbor VAMC
- Behavioral lab for interventions to improve quality and efficiency of care
- CAUTI prevention one of many initiatives: nurse-initiated reminder
- Focus: enhancing nurse-physician communication

Nursing Template for Maintenance

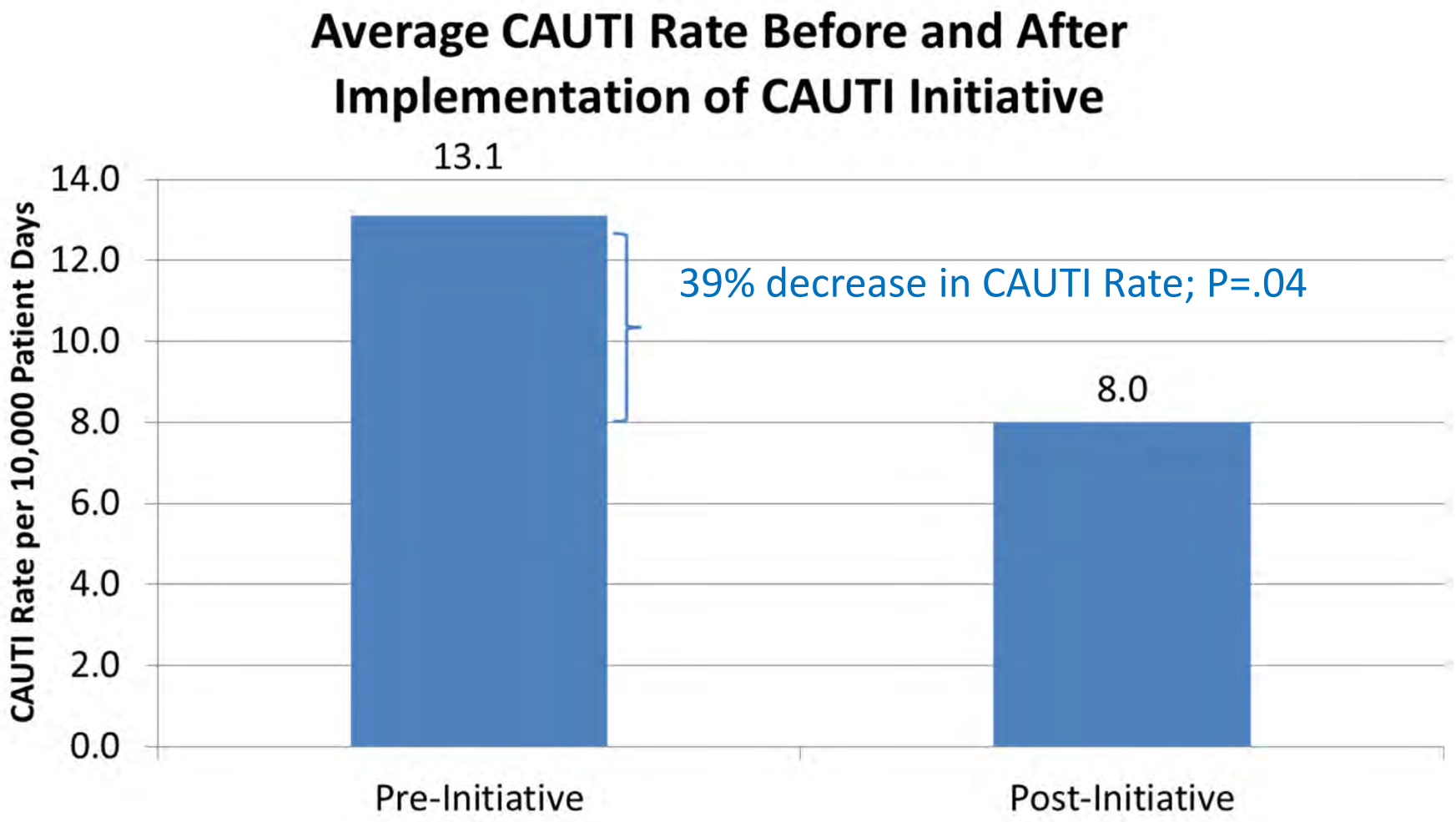


Patients with Inappropriate Indication for Foley



CAUTI Rate

(Miller et al. Infect Cont Hosp Epid 2013 – in press)



Implementing Change

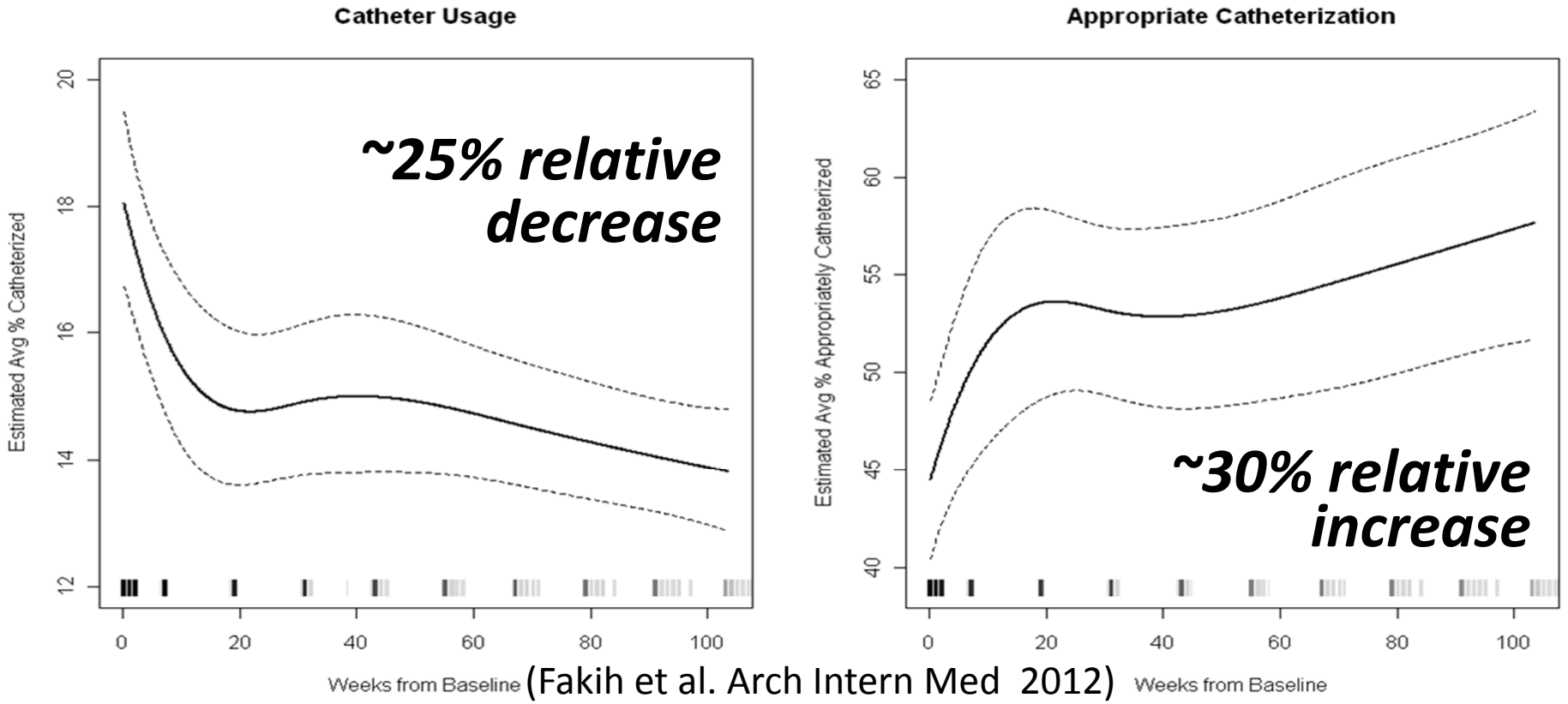
At Home

Across the State of Michigan

Reducing Inappropriate Urinary Catheter Use: A Statewide Effort

- Evaluate the effect of the Keystone Center's CAUTI Initiative in Michigan: "Bladder Bundle"
- Study Period: 2007 to 2010
- 163 units in 71 participating Michigan hospitals
- Nurse-led catheter discontinuation protocol

CAUTI in Michigan



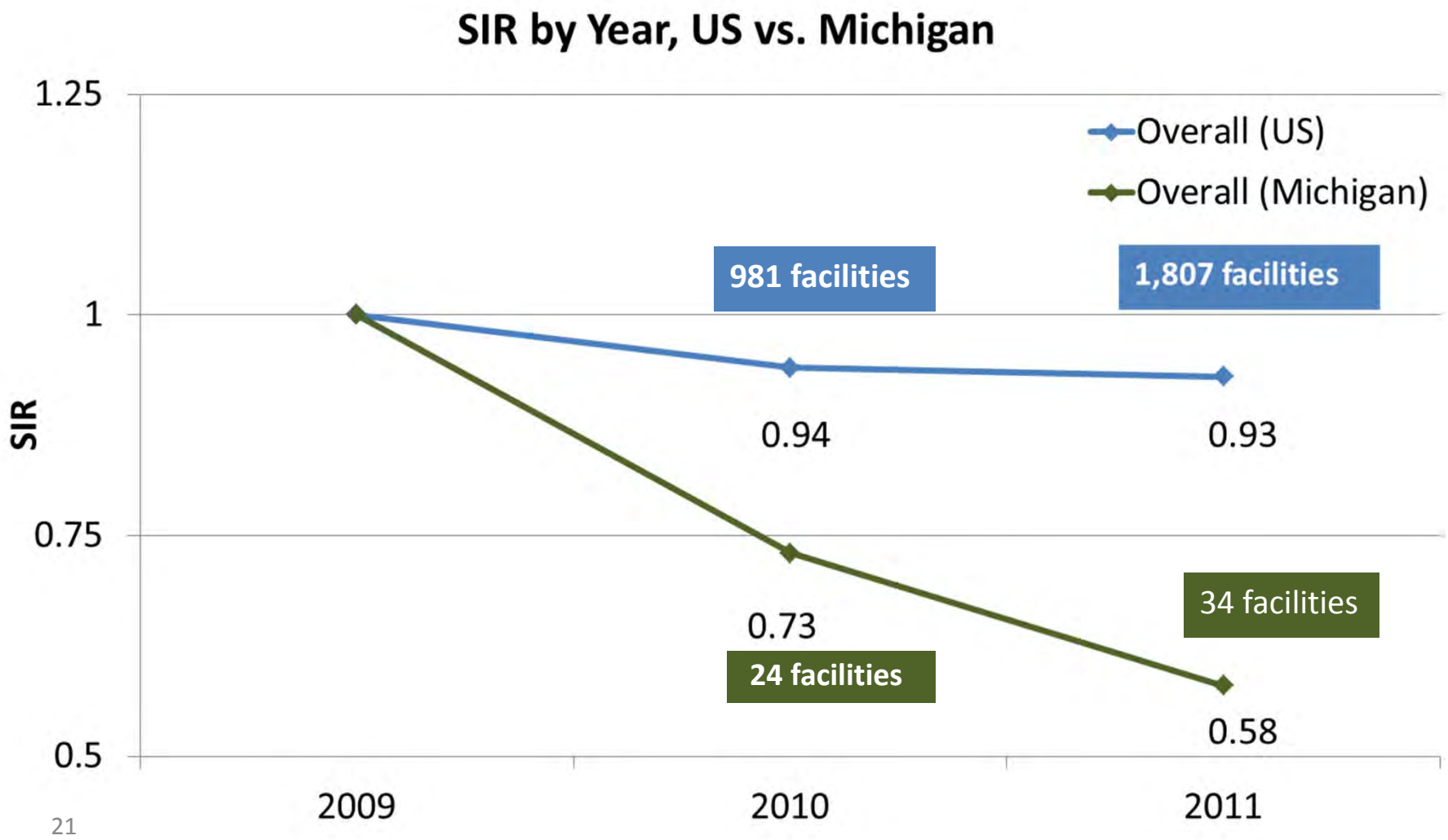
(Fakih et al. Arch Intern Med 2012)

CAUTI ↓ by ~25% in Michigan hospitals (95% CI: 13 to 37%↓)

CAUTI ↓ by ~6% in non-Michigan hospitals (95% CI: 4 to 8%↓)

(Saint et al. JAMA Intern Med 2013)

Catheter-Associated UTIs
(Slide courtesy of Scott Fridkin, CDC)



A key ingredient for success is figuring out how to engage the clinicians in the hospital.

Learning Objectives

- Describe the methods to engage clinicians in CAUTI prevention
- Describe methods to engage leadership in CAUTI prevention
- Employ the CAUTI cost calculator
- Identify future directions for implementing change

Start with a Plan

1. Form a CAUTI prevention team that consists of various key people, with one person identified as the team leader
2. Develop a CAUTI policy for the institution; the basics should be covered (e.g., condom catheters, bladder scanners)
3. Pick a unit where to begin, usually where there are the most number of catheters

Start with a Plan

4. Anticipate barriers – nurse resistance, physician resistance, patient/family requests for a catheter
5. Track performance (both processes and outcomes) and then escalate the intervention as necessary
6. Once successful, spread to other places (either units or other hospitals)

Key Roles and Responsibilities

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

(Modified from www.catheterout.org)

Physicians…

(Following slides courtesy of Dr. Fakih)

- 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)

The Physician Champion & Physician Supporters

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

Infectious Disease Specialists	Urologists
• Reduce CAUTI • Reduce antibiotic use • Reduce potential of increased resistance and Clostridium difficile disease	• Reduce trauma (mechanical complications): 1. Metal and urethral injury 2. Hematuria
Hospitalists	**Geriatricians**
• Infectious and mechanical complications • Potential catheter complications prolonging length of stay • Often salaried physicians with incentives based on hospital-based quality and efficiency	• Many elderly are frail • Urinary catheters are placed more commonly in elderly inappropriately • Urinary catheters increase immobility and deconditioning

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

Rehabilitation Specialists	Surgeons
• The urinary catheter reduces mobility in patients: "one-point restraint" • Rapid recovery (improvement in ambulation) may be hampered by the catheter	• Surgical Care Improvement Project: Remove catheters by postop day 1 or 2 • Inappropriate urinary catheter use may negatively affect the surgeon's profile • Risk of infection and trauma related to the catheter
Intensivists	**Emergency Medicine physicians**
• Intensivists can support the evaluation of catheter need before transfer out of the ICU	• Up to half of the patients are admitted through the emergency department (ED) • Inappropriate urinary catheter placement is common in the ED • Promoting appropriate placement of urinary catheters in the ED will reduce inappropriate use hospital-wide

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

Attention to Urinary Catheters: Workload

- 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…"

  (Damschroder et al., Qual and Safety in Healthcare 2009)

Learning Objectives

- Describe the methods to engage clinicians in CAUTI prevention
- Describe methods to engage leadership in CAUTI prevention
- Employ the CAUTI cost calculator
- Identify future directions for implementing change

Leadership Engagement Can Help

- The key senior leaders in preventing CAUTI are the CNO and CMO
- But other leaders are important…
- Unit managers/chiefs, service-line chiefs, hospital epidemiologist, infection preventionist

4 Key Behaviors of Effective Prevention Leaders
(Saint et al. Infect Cont Hosp Epid. Sept 2010)

1) Cultivated a culture of clinical excellence
   - Developed a clear vision
   - Successfully conveyed that to staff

2) Inspired staff
   - Motivated and energized followers
   - Some, not all, were charismatic

4 Key Behaviors of Effective Prevention Leaders
(Saint et al. Infect Cont Hosp Epid. Sept 2010)

3) Solution-oriented
   - Focused on overcoming barriers rather than complaining
   - Dealt directly with resistant staff

4) Thought strategically while acting locally
   - Planned ahead leaving little to chance; politicked before crucial issues came up for a vote in committees

One way to engage the leaders at your hospital is by showing them that you have a good plan.

Start with a Plan…

1) Form a CAUTI prevention team that consists of various key people, with one person identified as the team leader
2) Develop a CAUTI policy for the institution; the basics should be covered (e.g., condom catheters, bladder scanners)
3) Pick a unit where to begin, usually where there are the most number of catheters
4) Anticipate barriers – nurse resistance, physician resistance, patient/family requests for a catheter
5) Track performance (both processes and outcomes) and then escalate the intervention as necessary
6) Once successful, spread to other places (either units or other hospitals)

Another way to engage the leaders at your hospital is by showing them that you have a good plan B.

Tier 1 Protocol: Use of Indwelling Urinary Catheter Kit

Assess for the necessity of indwelling urinary catheter	Encourage use of alternatives to indwelling catheter	Use standard indwelling urinary catheter kit	Ensure proper insertion technique	Follow maintenance and removal template for care and removal of the catheter	Measure CAUTI rates monthly

Monitor CAUTI rates closely. Proceed to Tier 2 if either of the following conditions are met over a period of 6 months:

1. **ICU** ≥ 9 CAUTIs/10,000 patient days
   2 CAUTIs/1,000 catheter days
2. **Non-ICU, Acute Care** ≥3 CAUTIs/10,000 pt days & 2 CAUTIs/1,000 catheter days

Tier 2 Protocol: Enhanced Practices – Evaluation of indication for use, maintenance, and removal technique

Assess and document competency of healthcare workers performing insertion	Consider Root Cause Analysis or Focused Review of CAUTI or catheter use to identify improvement opportunities	Measure monthly for 6 months; re-evaluate. If rate has dropped below indicated levels proceed back to Tier 1	Sources: HICPAC CDC Guidelines on CAUTI Prevention www.catheterout.org

(Department of Veterans Affairs, VISN 11)

A third way to engage the leaders at your hospital is by considering sustainability at the outset.

Acknowledgements…

Mohamad Fakih, MD, MPH

Medical Director, Infection Prevention and Control

St. John Hospital and Medical Center

Sarah Krein, PhD, RN

Research Associate Professor, Division of General Medicine

University of Michigan, Ann Arbor

What is Sustainability?

- Desired health benefits are maintained or improved

- The innovation – CAUTI prevention/reducing catheter use or CLABSI prevention – loses its separate identity and becomes part of the regular activities of the unit or hospital ("institutionalization")

Factors that Influence Sustainability

1) Integration with existing programs/services ("institutionalization")
2) Program champions
3) Periodic evaluation and feedback

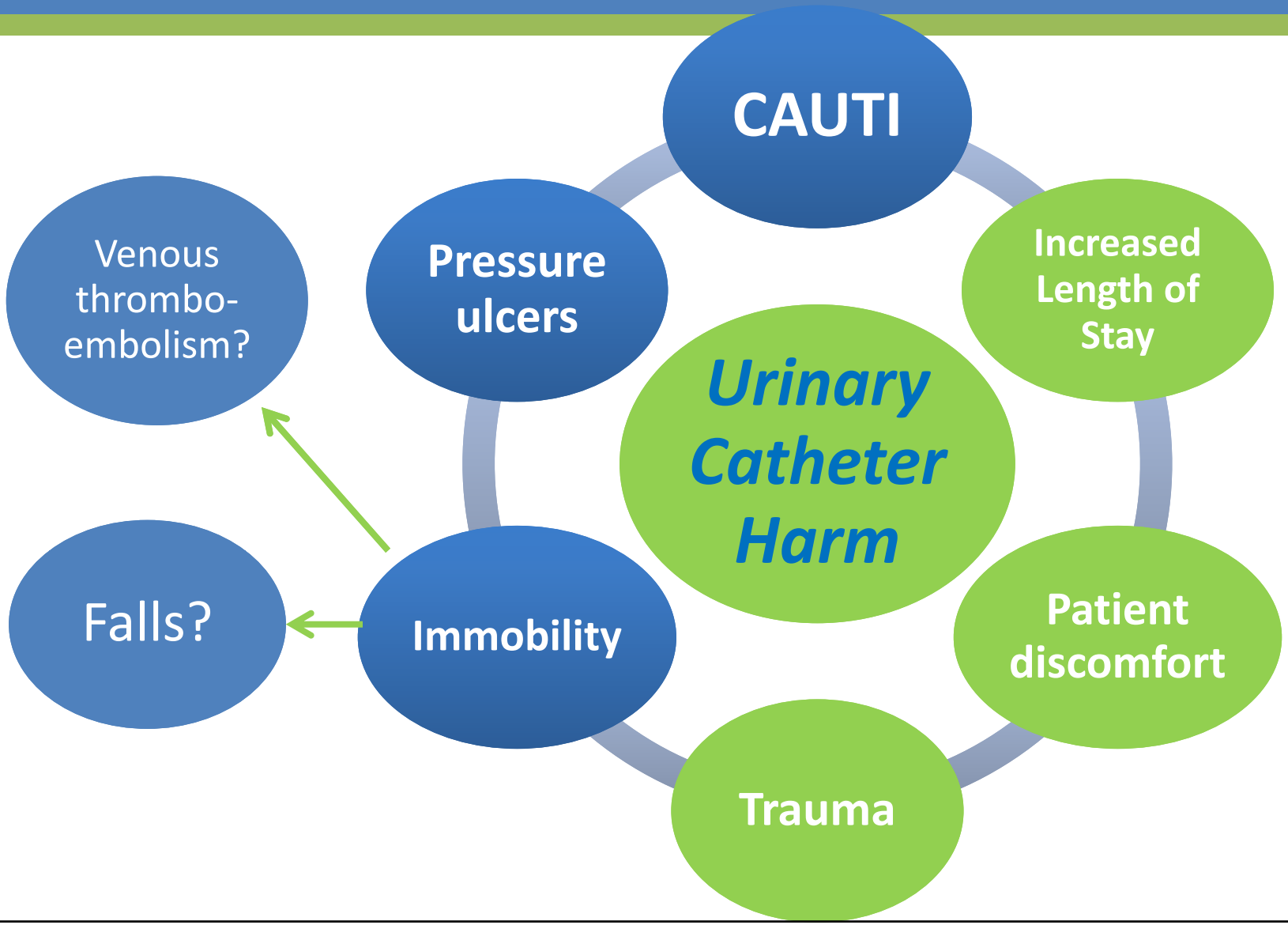
1) Institutionalization

- The initiative becomes part of the "standard of care" in the hospital (or unit)
  - Only place the urinary catheter based on appropriate indications
  - Comply with proper insertion and maintenance
  - Evaluate daily for need; remove if unnecessary
- With time, modifications of the program may occur based on new evidence (e.g., appropriate indications)

1) Institutionalization

- Routinization and Integration
  - Align with the organization's goals (e.g., promoting safety)
  - Regular education and competencies
  - Nursing daily routine
  - Use of electronic reminders/nursing templates
  - Identify how this work might be synergistic with other initiatives

Addressing in the Broader Patient Safety Context



2) Project Manager + The Champions (Nurse/Physician)

- Identified during implementation
- Keeps the effort as a priority
- Provide expertise in the topic
- Liaison with peers to promote best practice to reduce CAUTI risk
- Help in disseminating the findings

Factors that Influence Sustainability

1) Integration with existing programs/services ("institutionalization")
2) Program champions
3) Periodic evaluation and feedback

3) Periodic Evaluation and Feedback

- Periodically evaluate catheter use and CAUTI rates to identify new or ongoing opportunities for intervention
  - Urinary catheter point prevalence (with or without appropriate use)
  - Proper insertion technique audits and maintenance of the urinary catheter
  - Outcome rates

A final way to engage leaders is to discuss money with them…

Learning Objectives

- Describe the methods to engage clinicians in CAUTI prevention
- Describe methods to engage leadership in CAUTI prevention
- Employ the CAUTI cost calculator
- Identify future directions for implementing change

CAUTI Cost Calculator

- Estimates hospital's costs due to CAUTI
- Estimates both current costs and projected costs after a hypothetical intervention to reduce catheter use
- www.catheterout.org

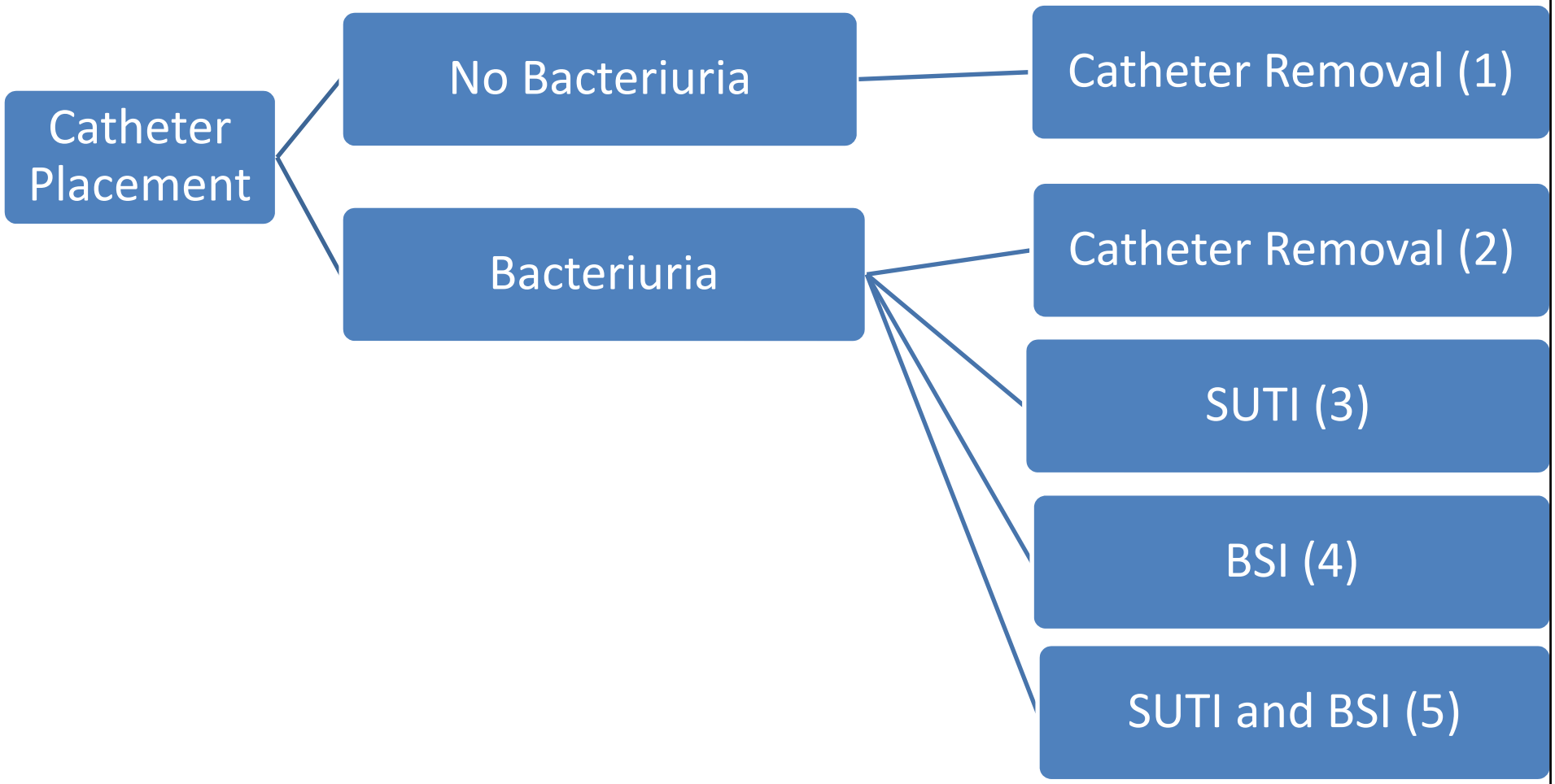
CAUTI Cost Calculator

- Time to event framework
- Event times among “n” catheterized patients
  - T_{bact} = time to bacteriuria from catheter placement
  - T_{SUTI} = time to SUTI from bacteriuria
  - T_{BSI} = time to BSI from bacteriuria
  - T_{remv} = time to removal from placement

CAUTI Cost Calculator

- Five possible patient trajectories
  - No infection ($T_{remv} < T_{bact}$)
  - Only bacteriuria ($T_{bact} < T_{remv} < T_{bact} + \min(T_{SUTI}, T_{BSI})$)
  - Only SUTI ($T_{bact} + T_{SUTI} < T_{remv} < T_{bact} + T_{BSI}$)
  - Only BSI ($T_{bact} + T_{BSI} < T_{remv} < T_{bact} + T_{SUTI}$)
  - Both SUTI and BSI ($T_{bact} + \max(T_{SUTI}, T_{BSI}) < T_{remv}$)

CAUTI Cost Calculator



CAUTI Cost Calculator

- Simplifying Assumptions
  - Costs not incurred for patients with trajectories 1 or 2
    - Asymptomatic bacteriuria typically unknown
- SUTI and BSI costs are additive for patients with both SUTI and BSI (trajectory 5)
    - Costs for these patients are equal to the sum of costs for patients with only SUTI and only BSI (trajectories 3 and 4)

CAUTI Cost Calculator

Current Costs

Total CAUTI Costs =
(per patient SUTI costs) * (number with SUTI) +
(per patient BSI costs) * (number with BSI)

SUTI per patient = $911
BSI per patient = $3824

CAUTI Cost Calculator

- Number with SUTI (or BSI) =

  Total number patients * proportion with SUTI (or BSI)

- Proportion SUTI =

  (SUTI risk among those catheterized with bacteriuria) *

  (bacteriuria risk among those catheterized) *

  (proportion catheterized)

CAUTI Cost Calculator

- Intervention to reduce CAUTI risk through
  - Reducing placement (i.e., proportion catheterized)
  - Reducing duration (i.e., mean duration of catheterization)
- Post intervention risk of bacteriuria as a function of
  - Percent decrease in mean duration due to intervention
  - Pre-intervention risk of bacteriuria among catheterized

CAUTI Cost Calculator

- Post intervention costs characterized as function of:
  - User-specified quantities
  - Quantities specific to intervention (plausible range)
  - Estimates from the literature

CAUTI Cost Calculator

Approximate number of annual adult hospital admissions: 3000

Percentage of adult hospitalized patients with indwelling urinary catheter on any given day: 15

(Enter whole value between 0-100)

Submit

1

2

3

If you aren't sure about your hospital's numbers, you can leave the field blank and the calculator will use a reasonable default value (3,000 adult admissions and/or 15% catheterized).

Here's an example:

For a hospital with 3,000 adult admissions in a given year, and 15% catheterized, we get the following results:

CURRENT ESTIMATED COSTS:

$41,688

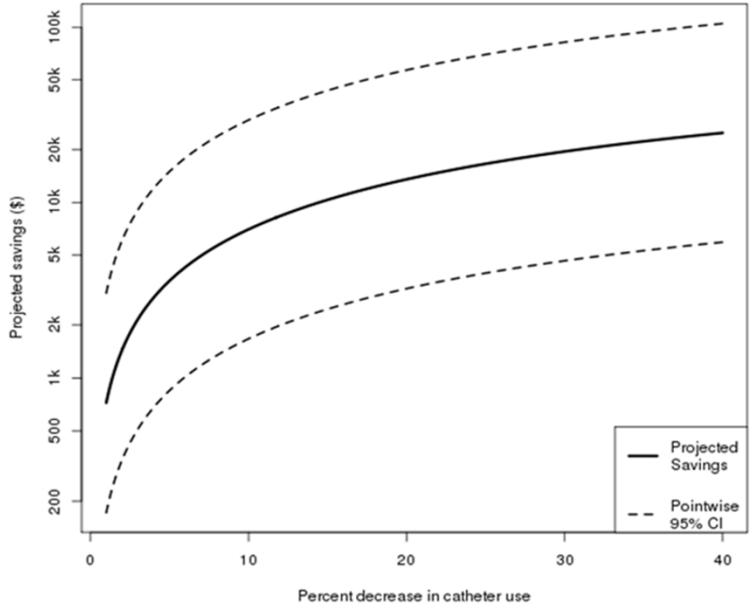
Projected costs after intervention*:

$20,632

PROJECTED SAVINGS (95% CI):

$21,056 ($5,008 - $88,524)

* Based on prior interventions showing a 37% decrease in duration and a 29% decrease in placement.



CAUTI Cost Calculator

Approximate number of annual adult hospital admissions: 35000

Percentage of adult hospitalized patients with indwelling urinary catheter on any given day: 10

(Enter whole value between 0-100)

Submit

CURRENT ESTIMATED COSTS:

$324,237

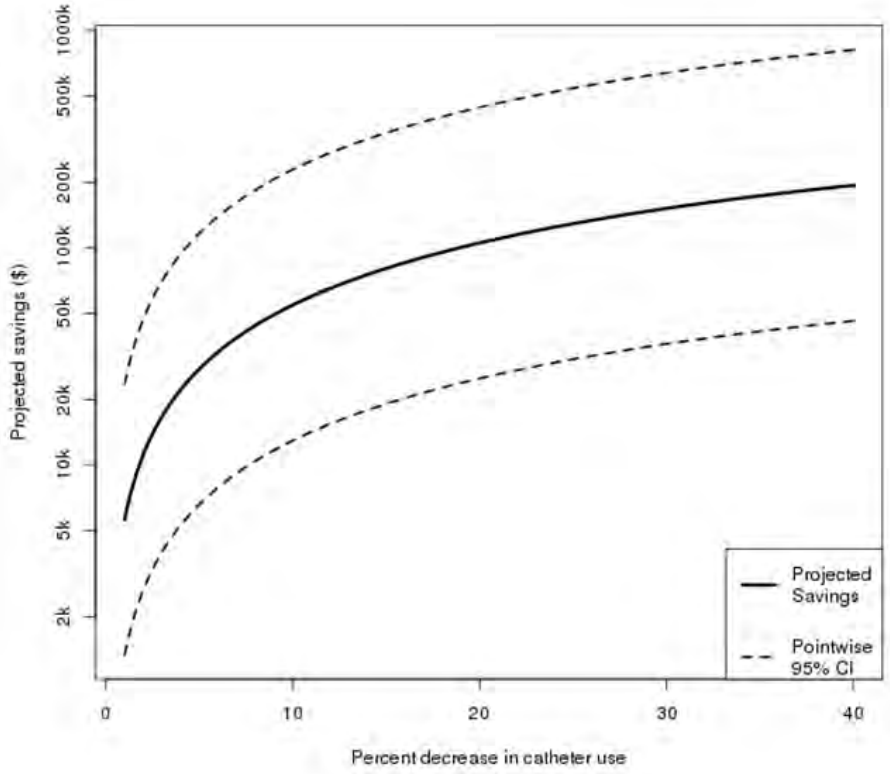
Projected costs after intervention*:

$160,468

PROJECTED SAVINGS (95% CI):

$163,769 ($38,954 - $688,514)

* Based on prior interventions showing a 37% decrease in duration and a 29% decrease in placement.



CAUTI Cost Calculator: Caveats

- Requires users to have input estimates
- Projected costs/potential savings do not consider full range of cost factors
  - Asymptomatic bacteriuria
  - Cost of intervention
  - Opportunity costs

CAUTI Cost Calculator

- Ongoing
  - Manuscript submitted to Journal Hospital Medicine
    - Kennedy EH, Greene MT, Saint S. Estimating Hospital Costs of Catheter-Associated Urinary Tract Infection
  - Modifying interface to display additional results
    - Intervention focused only on reducing duration
    - Intervention focused only on reducing placement

Learning Objectives

- Describe the methods to engage clinicians in CAUTI prevention
- Describe methods to engage leadership in CAUTI prevention
- Employ the CAUTI cost calculator
- Identify future directions for implementing change

The Future…

Trouble-Shooting Guide

Understanding Why Some Hospitals are Better than Others in Preventing Infection

- Mixed-methods national studies focusing on 3 HAIs: CAUTI, CLABSI, and VAP
- Funded by VA, NIH, and AHRQ
- Phone interviews and site visits to hospitals across the U.S.
- Interviewees were at various levels in the organization

Qualitative Experience

- A total of 198 formal interviews completed at 37 U.S. hospitals between 2005 and 2013
  - Conducted via phone or in person (14 site visits)
- Currently helping investigators in Switzerland on a mixed-methods study of HAI prevention in Europe
- Key lesson:

A LOT OF WORK!

Piloting a New Method

- Trying to obviate the need for site visits
- Proposing a 1-page (10-item) trouble-shooting guide:

CAUTI Guide to Patient Safety ("CAUTI GPS")

CAUTI GPS Questions

1. Do you currently have a well-functioning team focusing on CAUTI prevention?
2. Do you have a dedicated project manager to coordinate your CAUTI prevention activities?
3. Do you have an effective nurse champion for your CAUTI prevention activities?
4. Do bedside nurses assess, at least daily, whether their catheterized patients still need a urinary catheter?

CAUTI GPS Questions

5. Do bedside nurses ensure the Foley is removed when no longer needed (e.g., by contacting the physician or removing the catheter per protocol)?

6. Do you have an effective physician champion for your CAUTI prevention activities?

7. Have physicians fully embraced CAUTI prevention activities?

CAUTI GPS Questions

8. Has senior leadership fully supported CAUTI prevention activities?

9. Do you currently collect CAUTI-related data (e.g., catheter prevalence and appropriateness) in the unit(s) in which you are intervening?

CAUTI GPS Questions

10. Have you experienced any of the following barriers:
    - Substantial nursing resistance?
    - Substantial physician resistance?
    - Patient and family requests for a Foley?
    - Foleys commonly being inserted in the ED without an appropriate indication?

Learning Objectives

- ✓ Describe the methods to engage clinicians in CAUTI prevention
- ✓ Describe methods to engage leadership in CAUTI prevention
- ✓ Employ the CAUTI cost calculator
- ✓ Identify future directions for implementing change

Thank you!

Questions?

Funding

Prepared by the Health Research & Educational Trust of the American Hospital Association with contract funding provided by the Agency for Healthcare Research and Quality through the contract, “National Implementation of Comprehensive Unit-based Safety Program (CUSP) to Reduce Catheter-Associated Urinary Tract Infection (CAUTI), project number HHSA290201000025I/HHSA29032001T, Task Order #1.”

Health Literacy and Patient and Family Engagement: Strategic Tools to Prevent CAUTI

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Learning Objectives

- Describe the importance of health literacy in CAUTI prevention
- Summarize ways to engage patients and families in CAUTI prevention

Part I: Health Literacy

Objectives:

- Define Health Literacy and Its Implications for Patient Care
- Understand Major Barriers to Health Literacy
- Review Strategies to Enhance Health Literacy

Defining Health Literacy

- Health Literacy is the ability to:

  --obtain,

  --understand, and

  --act on health information

- Dependent on clear communication between patient and the medical team

Why is Improved Medical Communication Important?

BIG PICTURE:

Institute of Medicine Key Healthcare Dimensions

Patient Centered

Timely

Safe

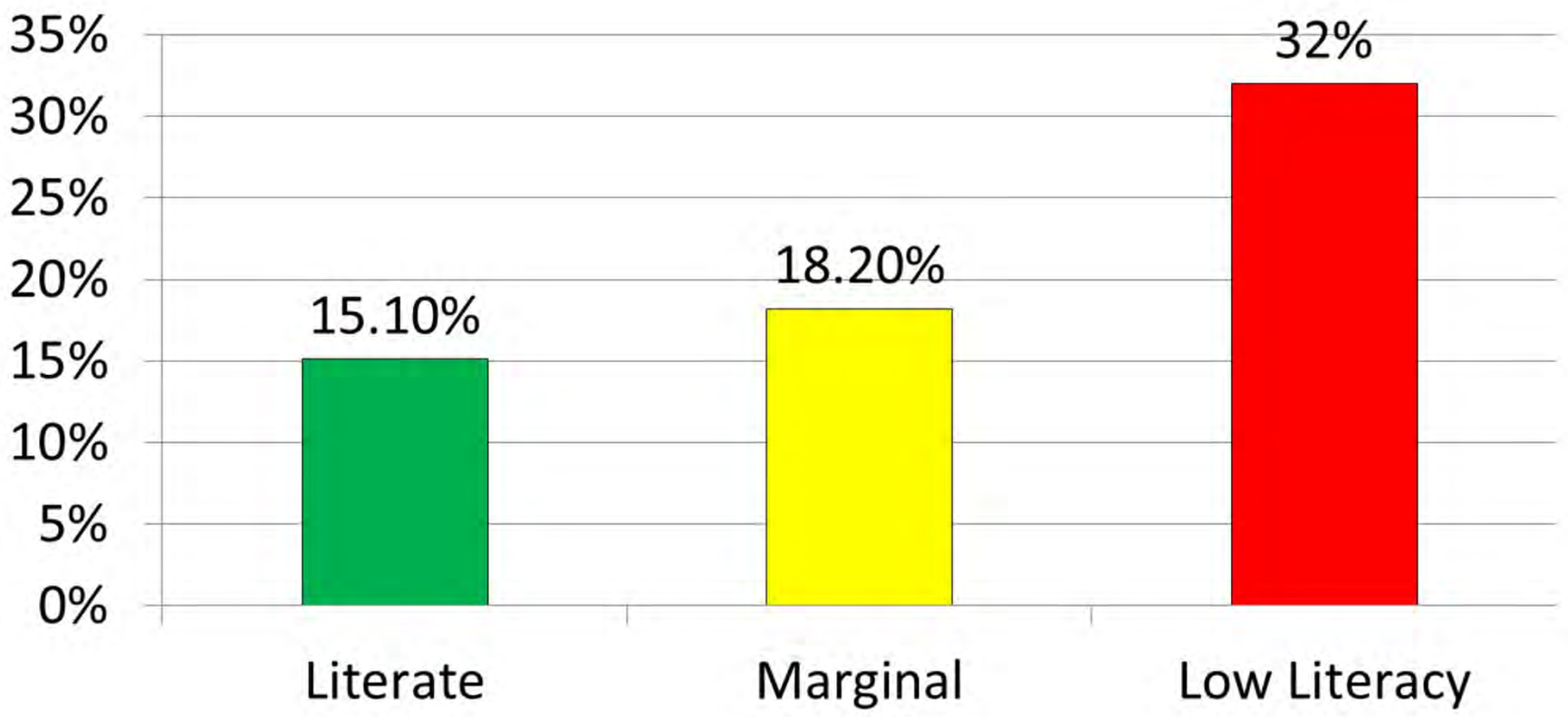
Effective

Efficient

Equitable

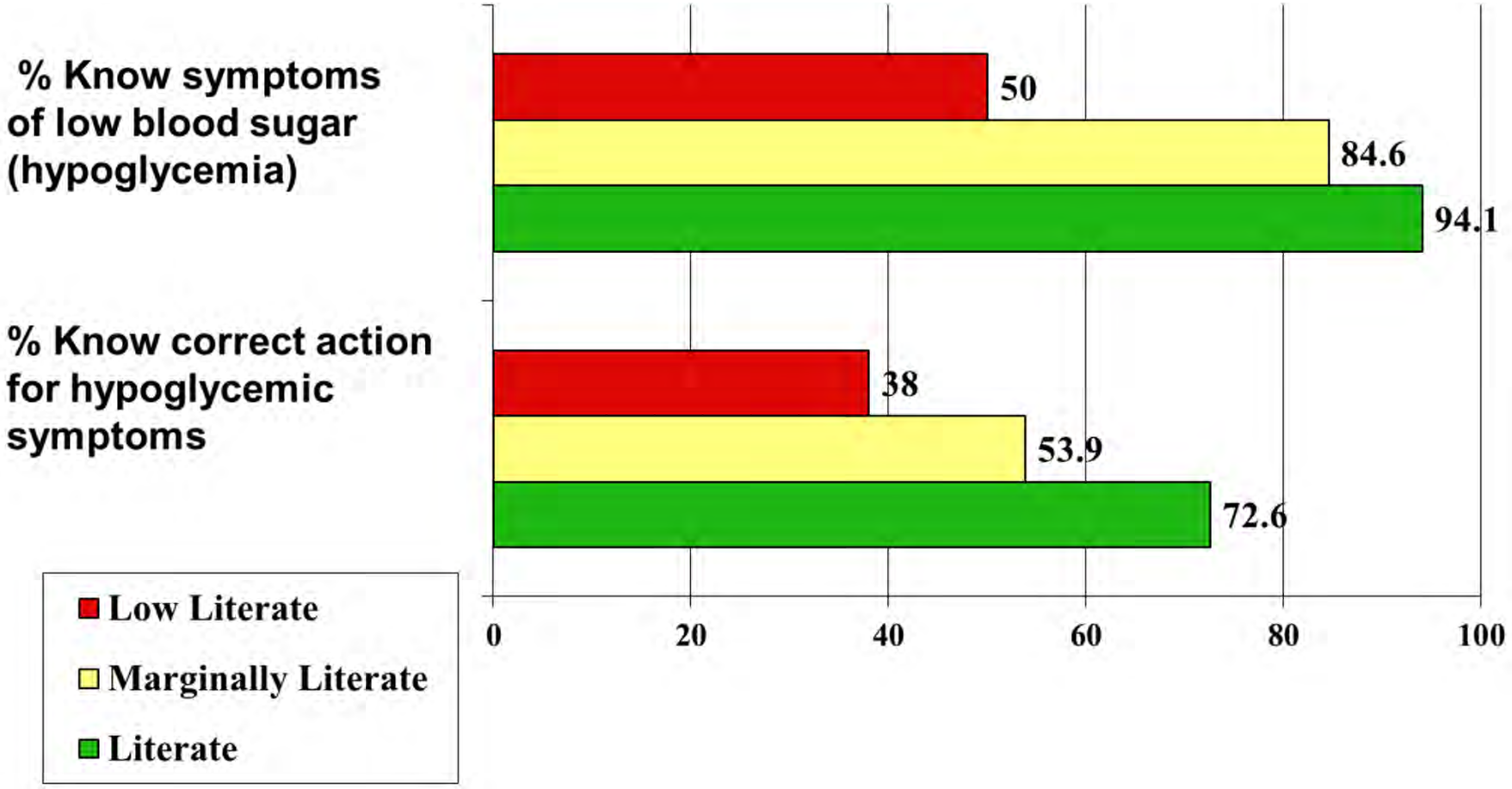
---*Crossing the Quality Chasm, 2001*

Patients With Low Literacy are more likely to be hospitalized



Baker, Parker, Williams, et al. *JGIM* 1999

Low Health Literacy Affects Chronic Disease Management
(Williams et al, Arch Int Med 1998)



ALL SENTINEL EVENTS 2010-12
Most Frequent Root Causes

(*www.jointcommission.org/Sentinel_Event_Statistics, released 2/7/13)*

2010 N=802		2011 N=1243		2012 N=901	
Leadership	710	Human Factors	899	Human Factors	614
Human Factors	699	Leadership	815	Leadership	557
Communication	661 (82%)	Communication	760 (61%)	Communication	532 (59%)
Assessment	555	Assessment	689	Assessment	482
Physical Environment	284	Physical Environment	309	Information Mgmt	203

Why is Improved Medical Education Important?

APPLIED TO CAUTI PREVENTION:

- Improves patient understanding of catheters:
  ---appropriate reasons for use
  ---proper insertion and maintenance
  ---why they need to come out as soon as possible

Why is Improved Medical Education Important?

APPLIED TO CAUTI PREVENTION:

- Enhances patient-centered, compassionate care
- Improves patient safety by reducing infection risk
- Reduces prolonged hospital stays

Barriers to Health Literacy

- **Barriers to health literacy are multifactorial:**

  --- Complex healthcare system

  --- Patient factors (reading ability, age, emotions)

  --- Physician attitudes/communication skills

  --- Nursing issues (culture, time)

System Barriers to Health Literacy: Increasingly Complex Health System

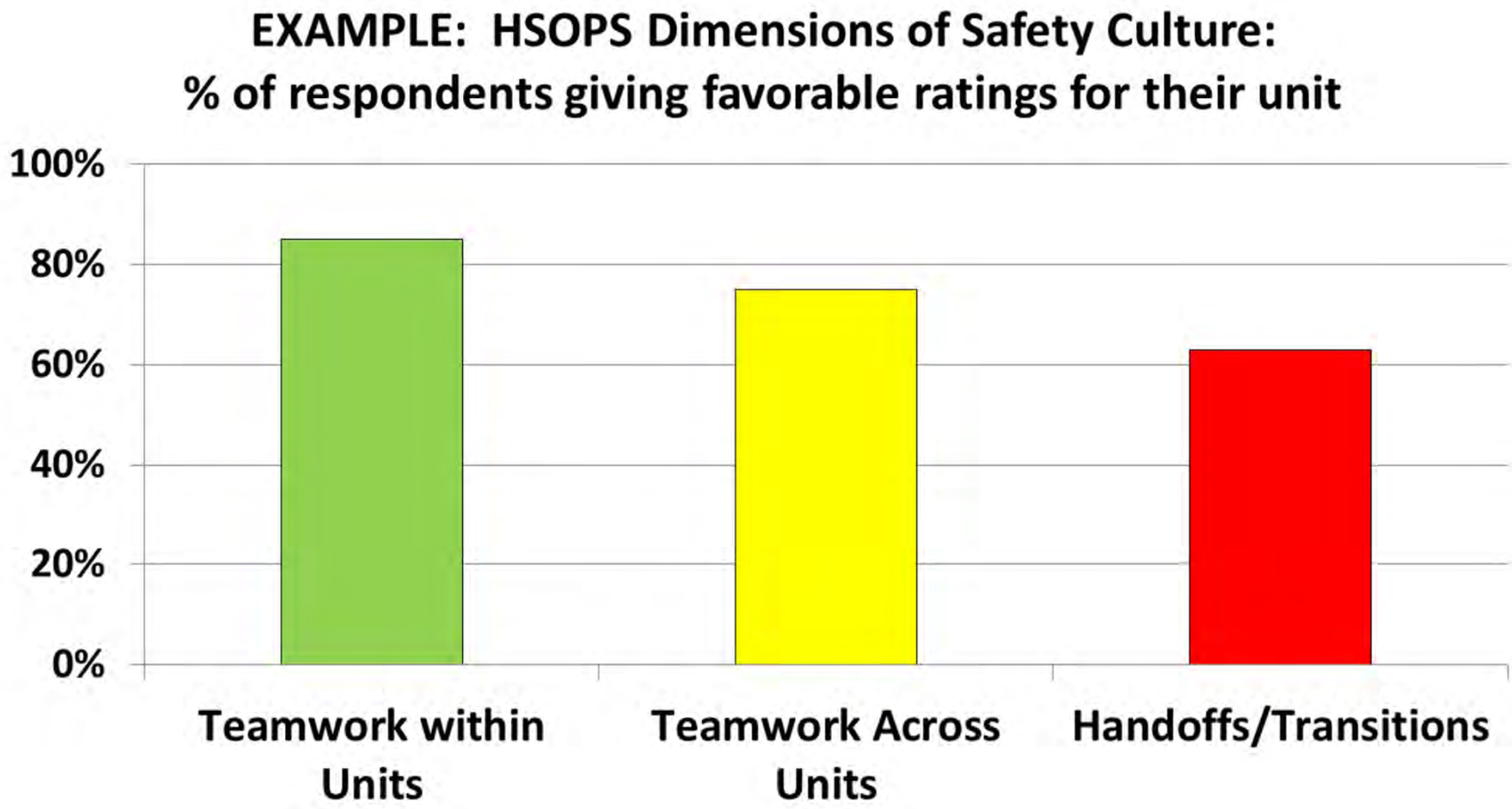
	35 Years Ago	Today
Treatment of Acute Myocardial Infarction	4-6 weeks bed rest in hospital	2-4 day LOS
Available Prescription Drugs	800+	10,000 +
Treatment of Newly Diagnosed Diabetes	3 weeks in hospital 2 hrs/day diabetic education	Outpatient mgmt 0-3 hrs classes Handouts Internet Telemedicine

System Barriers to Health Literacy

- Increasingly Complex Healthcare System
- Hospitalists, not your family physician
- More self-care and self-education expected
- Multiple handoffs / patient care unit

cultural issues

System Barriers to Health Literacy

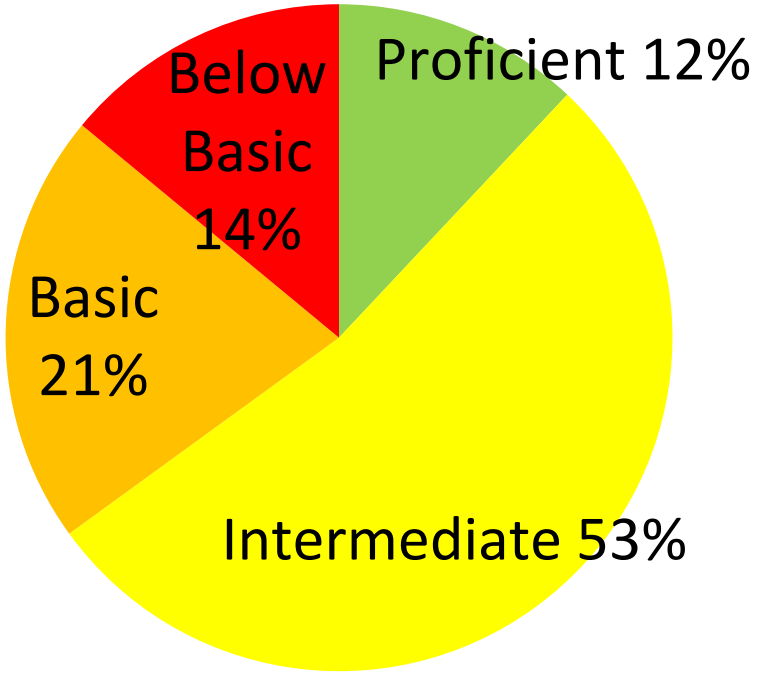


Patient Related Barriers
How Well Do Patients Read?

Scored on 4 Levels:

- Proficient 12%
- Intermediate 53%
- Basic 21%
- Below Basic 14%

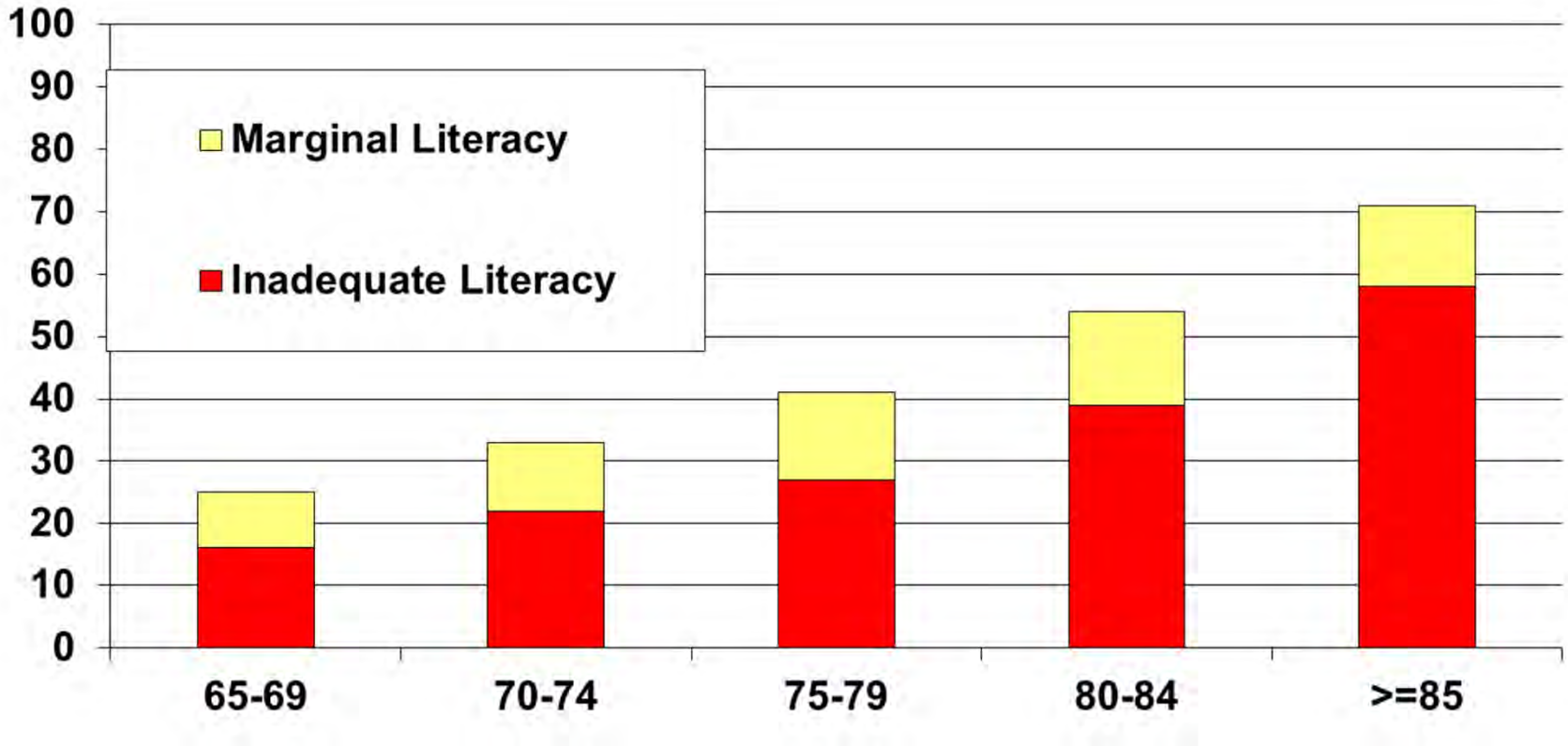
National Adult Literacy Survey*



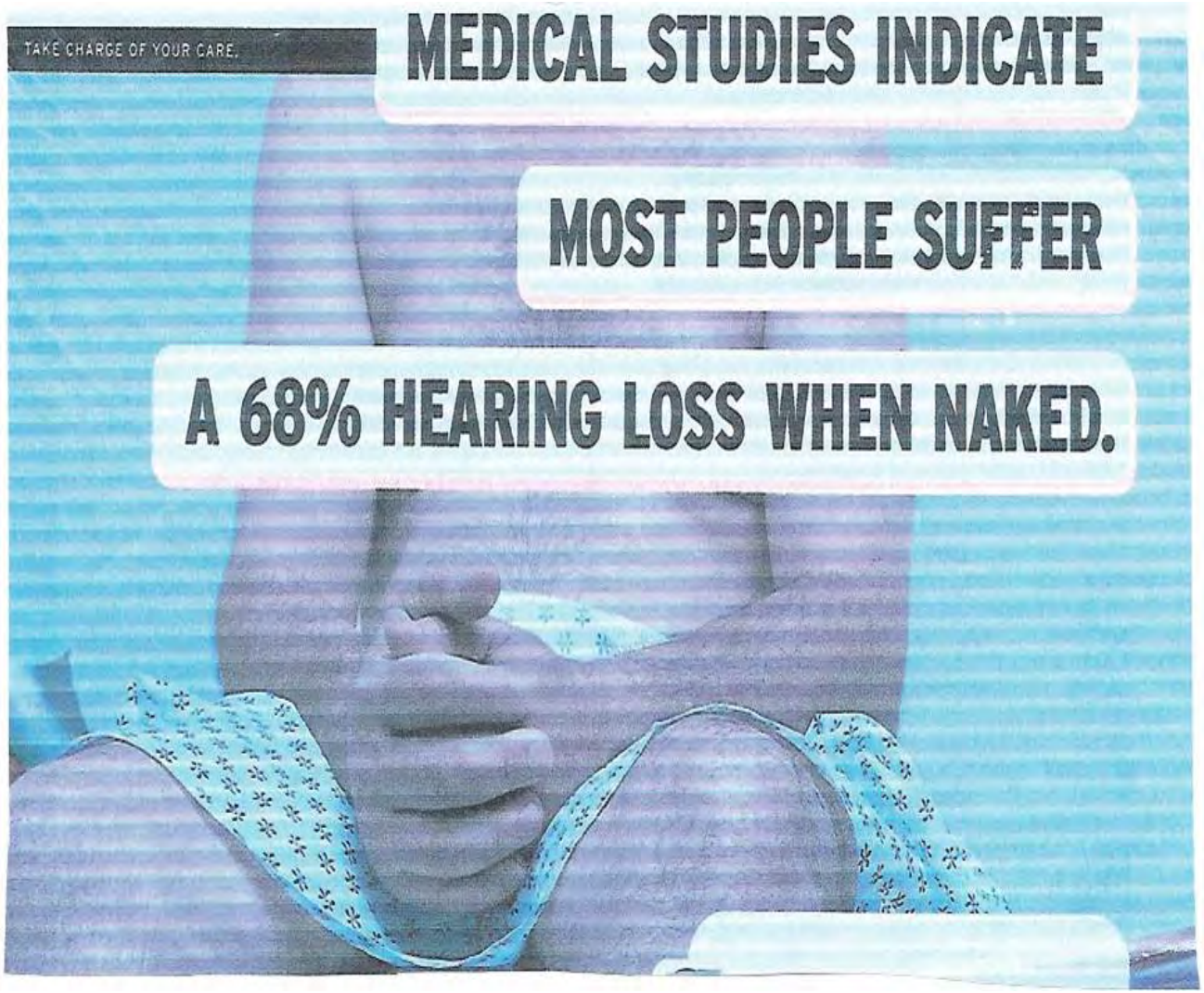
*(JAMA Feb 15, 2012, V.307, no. 7, p. 653)

Patient-related Barriers: Aging

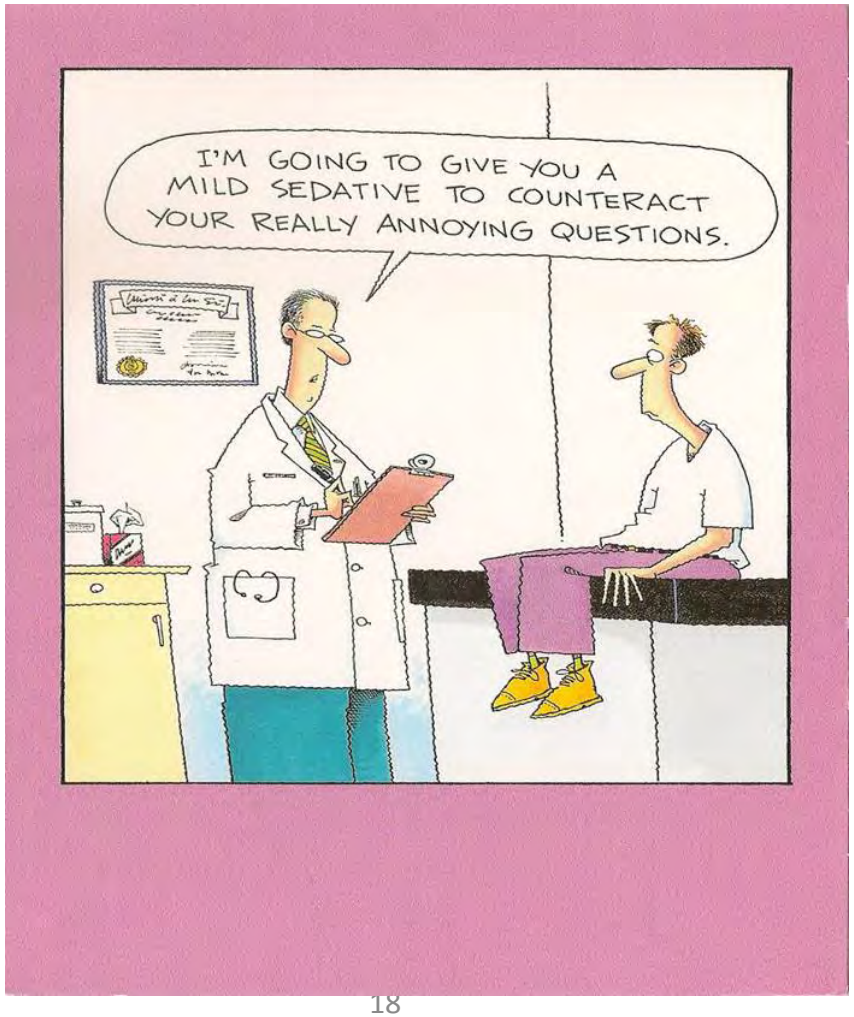
(Gazmarian, et al. JAMA 1999)



Patient-Related Barriers to Health Literacy: A Teachable Moment?



Clear Medical Communication: Physician Barriers



- Physician Attitudes
- Communication Skills
- Time

Clear Medical Communication: Nursing Barriers

- Time
- Lack of Clarity of Daily Goals

  --(including reason for the catheter!)
- Culture issues

  ---between physicians and nurses

  ---between units

Strategies for Improving Medical Communication

System Level:

- Create a "Patient-Centered" Environment on Your Unit
- Assess all Patients for Literacy

As Individuals:

- Commit to Improving Your Communication Skills

System Approaches: Fostering a Patient-Centered Unit

Key Strategies:

1. Adopt an attitude of helpfulness
2. Respect patients' privacy and dignity
3. Convey a safe, non-judgmental attitude

✓ *Treat all patients as if they were your family!*

System Approaches: Assess All Patients for Literacy

Key Strategies:

- **Initial Patient Assessment**

  --- how far did they go in school?

  --- how do they best learn?

  --- social history/support system

  --- watch for subtle clues that they don't read well

System Approaches: Assess All Patients for Literacy

Red Flags: Patients with literacy issues may:

- Have trouble completing forms
- Be unable to list their medications
- Be labeled “non-compliant” (missing appointments, tests, and referral visits)
- Seem angry or demanding
- Have difficulty explaining concerns or have no questions

For All Health Team Members: 4 Key Steps to Improve YOUR Skills

1. Remember this is a dialogue
   ---Sit at patient's eye level
   ---Listen more than you speak!
   ---Allow time for questions
2. Explain things clearly in plain language
   ---Speak slowly
   ---Avoid jargon

For All Health Team Members: 4 Key Steps to Improve YOUR Skills

3. Focus on key messages and repeat

Patients should leave you knowing 3 things:

- What is wrong?
- What do I need to do about it?
- Why is it important that I follow this plan?

EXAMPLE 1: One Key Message for a Patient with a Catheter

- ***What's wrong?***
  - I need a catheter for a short time to drain the urine from my bladder.
- ***What do I need to do about it?***
  - Make sure that the staff and I always keep the drainage bag lower than my bladder.
- ***Why is it important that I follow these instructions?***
  - I can get a serious infection if the bag is not positioned correctly.

EXAMPLE 2: One Key Message for a Patient with a Catheter

- ***What's wrong?***
  - I need a catheter for a short time to drain the urine from my bladder.
- ***What do I need to do about it?***
  - Make sure that all staff clean their hands before and after touching my catheter.
- ***Why is it important that I follow these instructions?***
  - I can get a serious infection if staff don't clean their hands before caring for me.

For All Health Team Members:
4 Key Steps to Improve YOUR Skills

4. Use a “teach back” or “show me” technique to check for understanding.

“Can you show me how you will manage your drainage bag when you go for a walk in the hall?

OR

“I want to be sure I explained everything clearly about your catheter, so can you please explain it back to me, so I can be sure I did a good job?”

Try <u>not</u> to ask, *“Do you understand?”*

For Written Educational Materials: Patient-Friendly Guidelines

- **For handouts**
  - ---Simple words (1-2 syllables)
  - ---Short sentences (4-6 words)
  - ---Short paragraphs (2-3 sentences)
  - ---No medical jargon
  - ---Headings and bullets
  - ---Lots of white space.

“Patient Friendly” Handouts: Additional Hints

- Show or draw only simple pictures
- Focus only on key points
- Emphasize what the patient should DO
- Minimize info about anatomy and physiology
- Be sensitive to cultural preferences.

Summary: Health Literacy

- As many as 35% of your patients may have health literacy issues
- Limits ability to obtain, understand, and act on health information

Summary: Health Literacy

- Impact of limited health literacy:
  - --- poor compliance with medical management
  - --- increased risk of:
    - ---poor outcomes/adverse events
    - ---infections/prolonged hospital stays
    - ---patient/family anxiety

Summary: Health Literacy and Patient Safety

- Barriers to health literacy are multifactorial:
  - --- Complex healthcare system
  - --- Patient factors (reading ability, age, emotional overlay)
  - --- Physician attitudes/communication skills
  - --- Nursing issues (culture, time)

Summary: Health Literacy

- Improving patient understanding depends on:

  --- a “systems’” approach to

  --- creating a “patient-centered” unit

  --- screening for literacy issues

  --- individual staff commitment to improving their communication skills in

  --- face to face interaction

  --- written educational materials

Part II: Engaging Patients and Families Strategies for Success

Objectives:

- Discuss how to engage patients and families in healthcare.
- Describe factors that influence patient and family participation in healthcare.
- Use strategies to educate patients and family members about catheter harms.

The Patient's Hospital Experience[1]

Clinicians and Hospital Staff	Patients
Know how the hospital works and how to achieve results	• Are strangers in the hospital environment • Don't understand the system or culture
Know who hospital staff are and what they do	• Don't know who different staff are and what they do
Are busy and under a lot of stress	• Are often in pain or uncomfortable, vulnerable, or afraid • Are aware that hospital staff are busy and may not want to bother them

What is Patient/Family Engagement?[2]

- Involves "…collaborating with patients and families of all ages, at all levels of care and in all health care settings…acknowledges that families, however they are defined, are essential to patients' health and well-being…"

Patient/Family Engagement

- Involves patients and family as:
  - Members of the health care team
  - Advisors who work with clinicians and leaders to improve policies and procedures

How to Engage Patients and Families[1]

- When you enter the room:
  - Read chart before stepping in
  - Make eye contact with the patient
  - Introduce yourself by name and role
  - Introduce new people in room by name, role, and what they will do

How to Engage Patients & Families

- When you first assess the patient:
  - Ask how the patient prefers to be addressed
  - Identify family that should be partners in their care
  - Highlight main points of communication tools
  - Invite the patient and family to use the white board to “talk” with clinicians

How to Engage Patients and Families[1] (continued)

- Ask about and listen to the patient and family's needs and concerns:
  - Use open-ended questions
  - Listen to, respect, and act on what the patient and family say
  - Help patients articulate their concerns when needed
  - Obtain communication resources if the adviser or family member cannot understand you (i.e., translator)

How to Engage Patients and Families[1] (continued)

- Help the patient and family understand the diagnosis, condition, and next steps in their care:
  - Give timely and complete information—take every opportunity to educate patient and family
  - Use plain language
  - Invite the patient or family to take notes

Engagement as a Strategy to Prevent CAUTI

- The past few slides have offered pointers on how to increase patient engagement in general.
- Now we're going to zero in on patient and family engagement as a way to prevent CAUTI.

How Significant is CAUTI?

- CAUTI is the most common HAI (40%)
- Symptomatic CAUTI increases costs by $600 per episode
- Patients whose catheters are inserted inappropriately are more likely to develop CAUTI
  - Most common reason for inappropriate catheter use is incontinence
  - In one study patient or family request was responsible for > 30% of inappropriately placed catheters
- Risk for developing CAUTI increases 5% for every day the catheter remains in place

Factors that Influence Patient Participation[3]

Modifiable Factors	Fixed Factors
Acceptance of patient role	Age, sex, socioeconomic level, ethnic origin
Level of health literacy and extent of knowledge	Type of illness and comorbidity
Confidence in own capabilities	Clinician professional specialty
Type of decision making required	Stakes of the proposed outcome
Use of alternative medicine	

Education Strategies

- Assess what patients/families already know about catheters.
- Assess readiness to learn.
- Ask how patient/family prefers to receive information (e.g., video, pamphlet).
- One-on-one versus group education.

Additional Education Strategies

- Take care of pain control, toileting, and other needs first.
- Make environment as conducive to learning as possible (e.g., turn TV off).
- Provide materials at 4th grade reading level.
- “Chunk” information into manageable pieces, and provide one “chunk” at a time.

A Valuable Resource

- Catheterout.org: a website developed as part of an NIH funded study co-led by Drs. Sarah Krein and Sanjay Saint
- Helpful information for clinicians and patients

http://catheterout.org/?q=patient-family-ed

FAQs
(frequently asked questions)

about
"Catheter-Associated Urinary Tract Infection"

What is "catheter-associated urinary tract infection"?

A urinary tract infection (also called "UTI") is an infection in the urinary system, which includes the bladder (which stores the urine) and the kidneys (which filter the blood to make urine). Germs (for example, bacteria or yeasts) do not normally live in these areas; but if germs are introduced, an infection can occur.

If you have a urinary catheter, germs can travel along the catheter and cause an infection in your bladder or your kidney; in that case it is called a catheter-associated urinary tract infection (or "CA-UTI").

What is a urinary catheter?

A urinary catheter is a thin tube placed in the bladder to drain urine. Urine drains through the tube into a bag that collects the urine. A urinary catheter may be used:

- If you are not able to urinate on your own
- To measure the amount of urine that you make, for example, during intensive care
- During and after some types of surgery
- During some tests of the kidneys and bladder

People with urinary catheters have a much higher chance of getting a urinary tract infection than people who don't have a catheter.

How do I get a catheter-associated urinary tract infection (CA-UTI)?

If germs enter the urinary tract, they may cause an infection. Many of the germs that cause a catheter-associated urinary tract infection are common germs found in your intestines that do not usually cause an infection there. Germs can enter the urinary tract when the catheter is being put in or while the catheter remains in the bladder.

What are the symptoms of a urinary tract infection?

Some of the common symptoms of a urinary tract infection are:

Catheter insertion

- Catheters are put in only when necessary and they are removed as soon as possible.
- Only properly trained persons insert catheters using sterile ("clean") technique.
- The skin in the area where the catheter will be inserted is cleaned before inserting the catheter.
- Other methods to drain the urine are sometimes used, such as

- External catheters in men (these look like condoms and are placed over the penis rather than into the penis)
- Putting a temporary catheter in to drain the urine and removing it right away. This is called intermittent urethral catheterization.

Catheter care

- Healthcare providers clean their hands by washing them with soap and water or using an alcohol-based hand rub before and after touching your catheter.

  If you do not see your providers clean their hands, please ask them to do so.

- Avoid disconnecting the catheter and drain tube. This helps to prevent germs from getting into the catheter tube.
- The catheter is secured to the leg to prevent pulling on the catheter.
- Avoid twisting or kinking the catheter.
- Keep the bag lower than the bladder to prevent urine from backflowing to the bladder.
- Empty the bag regularly. The drainage spout should not touch anything while emptying the bag.

What can I do to help prevent catheter-associated urinary tract infections if I have a catheter?

From the "Catheter Out" Website

Urinary catheters are used when a person cannot empty his or her bladder either because something is blocking the urine flow or the bladder does not feel the need to empty. Urinary catheters may also be used during and shortly after some types of surgeries.

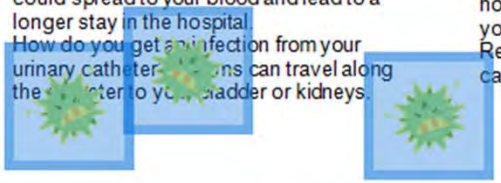
WHEN SHOULD YOU NOT RECEIVE A URINARY CATHETER?

Urinary catheters should not be placed just because you cannot get out of bed or because you leak urine (meaning you are "incontinent" of urine). There are other more safe measures that can be used instead.

WHAT ARE THE RISKS OF A URINARY CATHETER?

Urinary catheters can be harmful. They can hurt the bladder and cause you to feel pain below your belly button. Also, urinary catheters cause urinary infections which could spread to your blood and lead to a longer stay in the hospital.

How do you get a [illegible] infection from your urinary catheter? [illegible]ns can travel along the [illegible]ter to yo[illegible]bladder or kidneys.



Urinary catheters can tend to limit your movement in bed and in your room. Limited activity will make you weak. Also, urinary catheters can be uncomfortable.

WHAT ARE SOME ALTERNATIVES TO A FOLEY CATHETER?

A temporary catheter can be put in your bladder and then removed within minutes. Alternatively, men can use an external catheter (also known as a "condom-style" catheter) that is placed over the penis rather than in it.

I JUST HAD SURGERY OR I DO NOT FEEL LIKE I CAN GET OUT OF BED. SHOULD I REQUEST A URINARY CATHETER?

If your doctor believes it is important for you to have a urinary catheter he or she will tell you. One of the best ways to recover after surgery or while you are staying in the hospital is to get up and move as soon as your doctor says that it is fine to do so. Research shows that sometimes urinary catheters can interfere with your movement.

So, unless your doctor tells you the urinary catheter is necessary, it would be best for you not to have one.

IF YOU ALREADY HAVE A URINARY CATHETER WHAT CAN YOU DO?

Ask your doctor or your nurse every day if your urinary catheter is still necessary. The sooner it is removed, the lower your risk of infection and the sooner you can increase your mobility.

Make certain you know how to care for your urinary catheter and keep it clean. If you do not know how to do this, please ask your nurse or doctor today. Wash where the catheter enters your body every day with soap and water.

Clean your hands with soap and water or alcohol-based hand rub before and after touching your urinary catheter.

The urine drainage bag from your urinary catheter should stay lower than your bladder (your bladder is just below your belly button) at all times to prevent the urine from flowing back up into your bladder. This helps to prevent infection. If you notice that your drainage bag is too high, please tell your nurse.

You have a role in preventing infection!

Scenario 1—a patient or family member requests an indwelling urinary catheter because the patient and/or family does not want the patient to get out of bed:

"Urinary catheters can be harmful."
"They can hurt the bladder and cause you to feel pain below your belly button."
"Also, urinary catheters cause urinary infections which could spread to your blood and lead to a longer stay in the hospital."
"Urinary catheters can tend to limit your movement in bed and in your room. Limited activity could make you weak."
"Urinary catheters can be uncomfortable and patients can misinterpret the sensation of the catheter as the need to go the bathroom."
"One of the best ways to recover from your illness is to get up and move as soon as the doctor says that it is fine to do so. Research shows that sometimes urinary catheters can interfere with your movement."

Include for hospitals that have hourly rounding:
"We (the nurses) will touch base with every patient, every hour. If you/your family member needs to get out of bed for any reason, we will see him/her every hour and can assist him/her to the bathroom at that time. That would probably be the most effective and safest way to manage his/her symptoms."

ON THE CUSP: STOP HAI

Scenario 2—a patient or family member wants the patient to have an indwelling urinary catheter because they are afraid of soiling linens or incontinence or fall risk:

"Men can use an external catheter also known as a condom style catheter that is placed over the penis rather than in it."

"Bed side commodes can be requested if you feel you are too weak to walk to the bathroom."

*"If you are concerned about falling (*or the family is concerned*) please let the hospital staff know because there are extra precautions that can be taken such as sitters, help walking to the bathroom, and hourly rounding."*

"*We can use disposable underwear, hospital gowns, and waterproof sheets if you are worried about soiling linens***."**

"Urinary catheters can tend to limit your movement in bed and in your room and may actually make it more difficult to walk and/or lead to falls."

Scenario 3—in previous hospitalizations a patient has always had an indwelling urinary catheter and does not understand the change in policy:

"Risk for infection is significantly lower without the urinary catheter."

"Before we did not know how harmful urinary catheters can be."

Summary

- As healthcare providers, we forget how frightening a hospital can be.
- It's hard for patients/families to engage when we don't give them opportunities to participate in care.
- CAUTI remains a major, serious HAI.
- Strategies to promote health literacy and engagement may be important adjuncts in our efforts to reduce CAUTI.

Thank you!

Questions?

References

1. Guide to Patient and Family Engagement in Hospital Quality and Safety. Rockville, MD: Agency for Healthcare Research and Quality; July 2013. AHRQ Publication No. 13-####. http://www.ahrq.gov/professionals/systems/hospital/engagingfamilies/patfamilyengageguide/index.html
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3. Longtin Y, Sax H, Leape L, Sheridan SE, Donaldson L, Pittet D. (2010). Patient participation: Current knowledge and applicability to patient safety. *Mayo Clinic Proceedings, 85*(1), 53-62.

Funding

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Preventing CAUTI: What to Do When it's Time for Plan B

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Division of General Medicine
University of Michigan Health Systems
Associate Chief of Medicine, Ann Arbor VA Medical Center

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Research Associate Professor, Division of General Medicine
Department of Internal Medicine
University of Michigan, Ann Arbor

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Associate Professor of Medicine
Medical College of Wisconsin and the Milwaukee VAMC
Associate Program Director, MCW Internal Medicine Residency

Learning Objectives

- Define basic principles of CAUTI prevention
- Describe approaches to consider if CAUTI rates are not where you want them to be
- State how the GPS can support units with ongoing CAUTI problems
- Apply mindfulness to CAUTI prevention

Catheter-Associated Urinary Tract Infection (CAUTI)

- UTI is a common cause of hospital-acquired infection
- Most due to urinary catheters
- Up to 20 percent of inpatients are catheterized
- Leads to increased morbidity and health care costs

www.catheterout.org

Annals of Internal Medicine
ESTABLISHED IN 1927 BY THE AMERICAN COLLEGE OF PHYSICIANS
SEPTEMBER 17, 2013

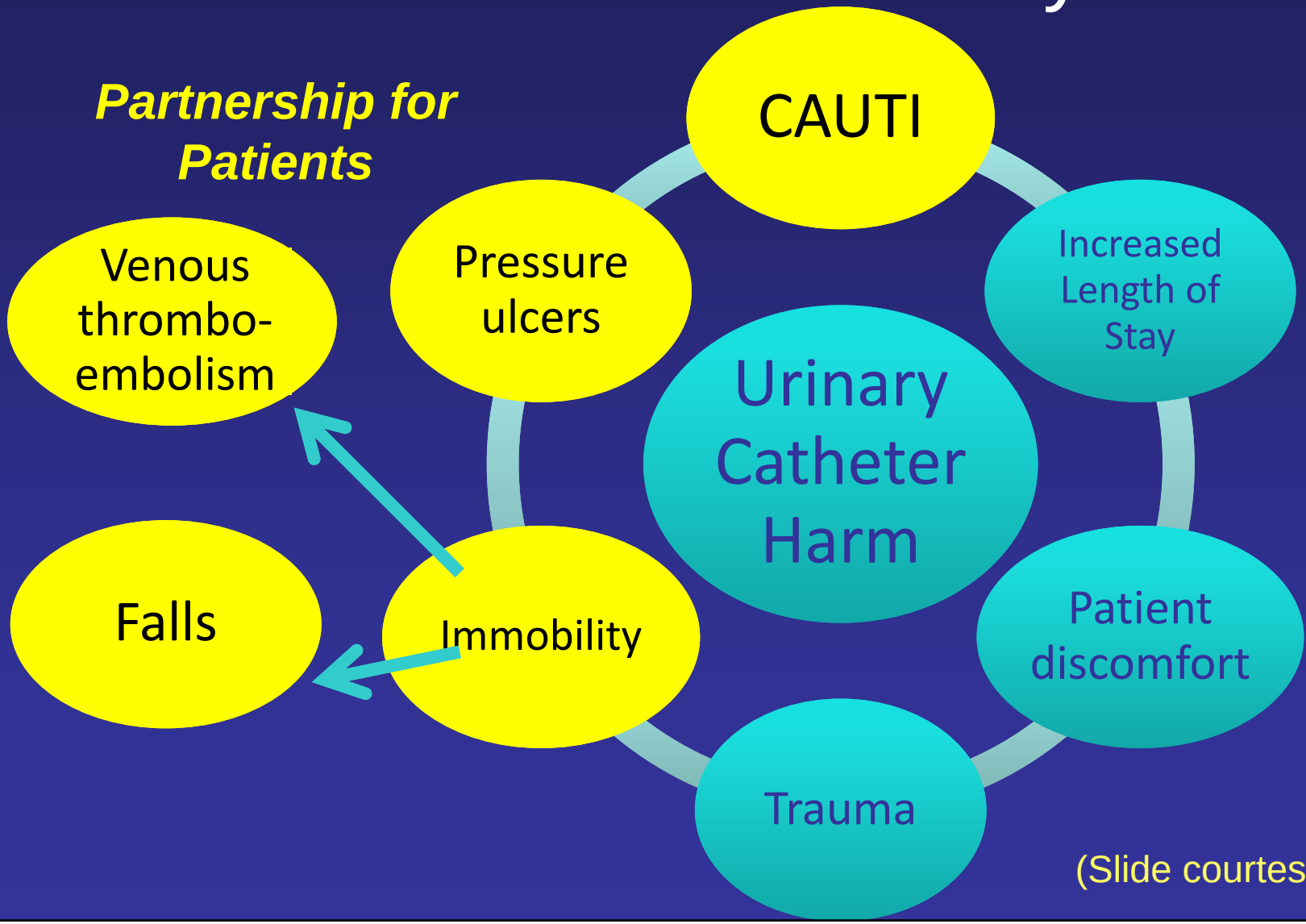
Determining the Noninfectious Complications of Indwelling Urethral Catheters

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."

Addressing CAUTI Prevention within the Broader Patient Safety Context

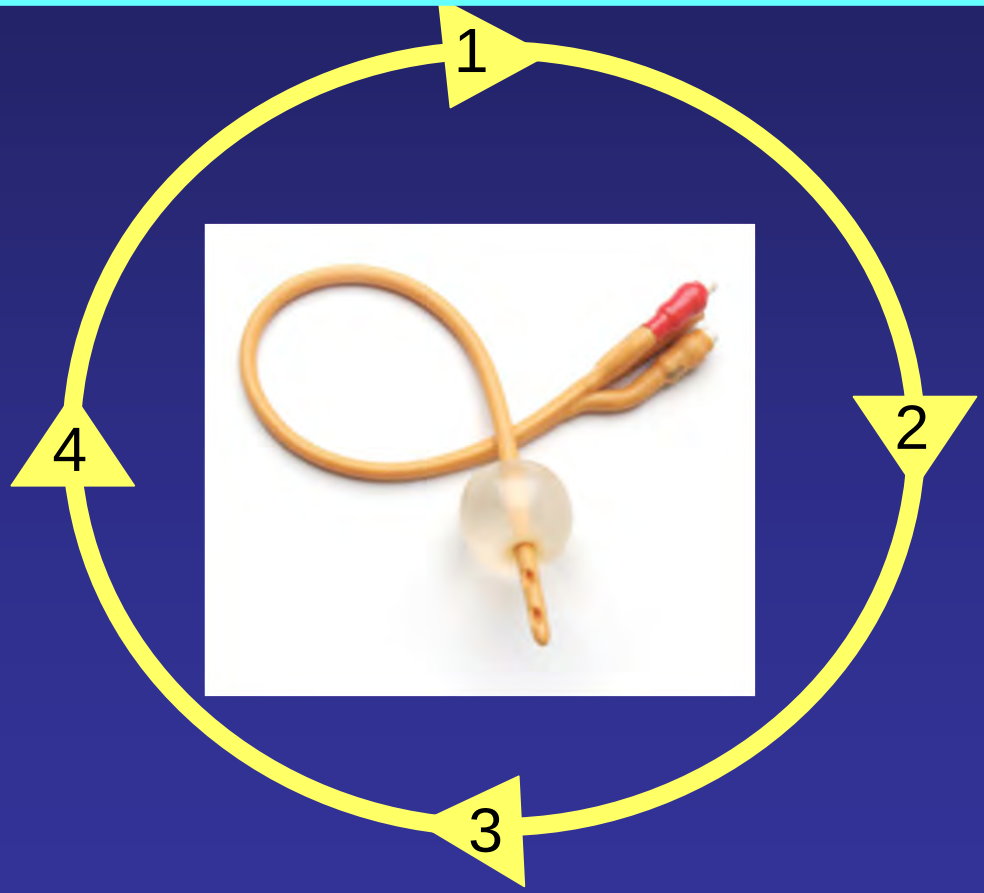


(Slide courtesy of Mohamad Fakih)

How can we reduce catheter use and prevent CAUTI?

Disrupting the Lifecycle of the Urinary Catheter

1. Preventing Unnecessary and Improper Placement



2. Maintaining Awareness & Proper Care of Catheters

3. Prompting Catheter Removal

4. Preventing Catheter Replacement

(Meddings. Clin Infect Dis 2011)

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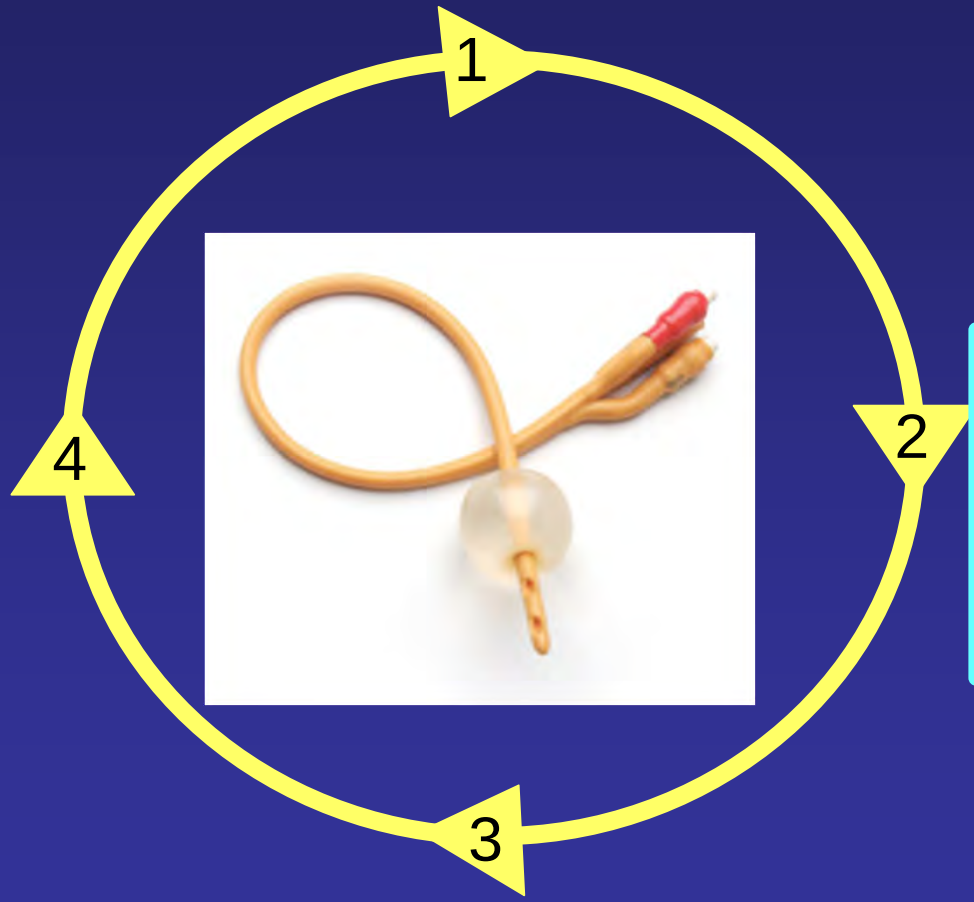

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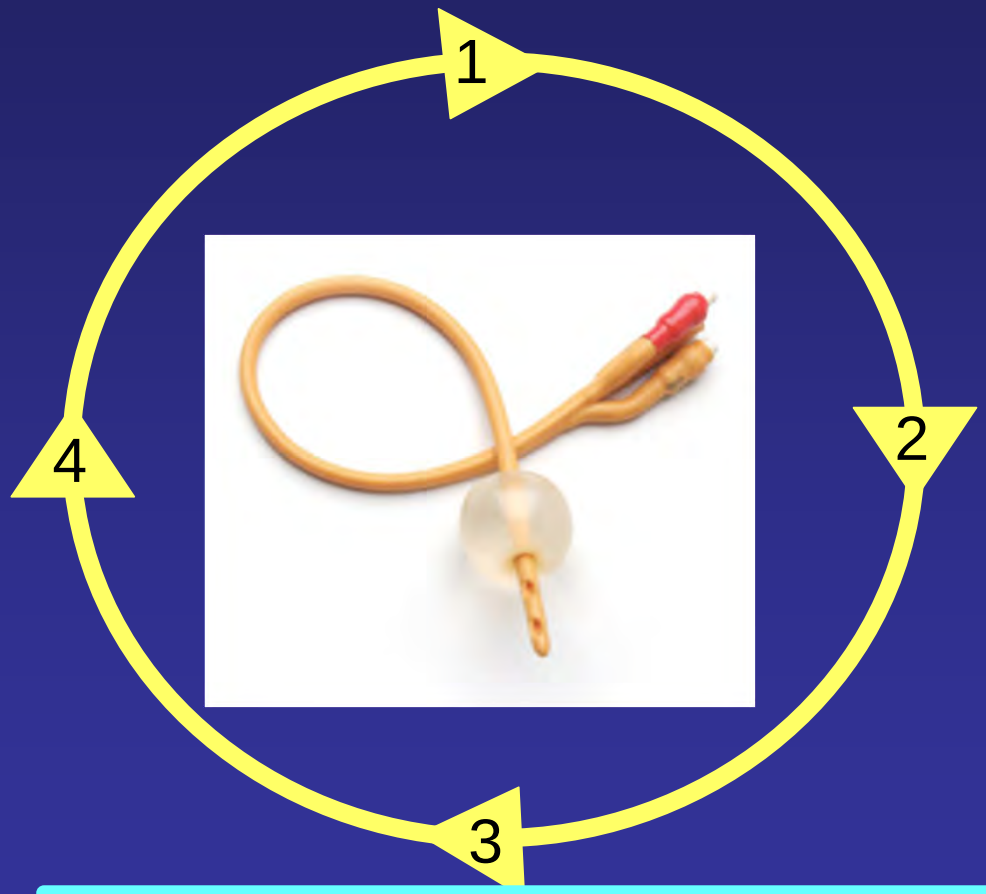

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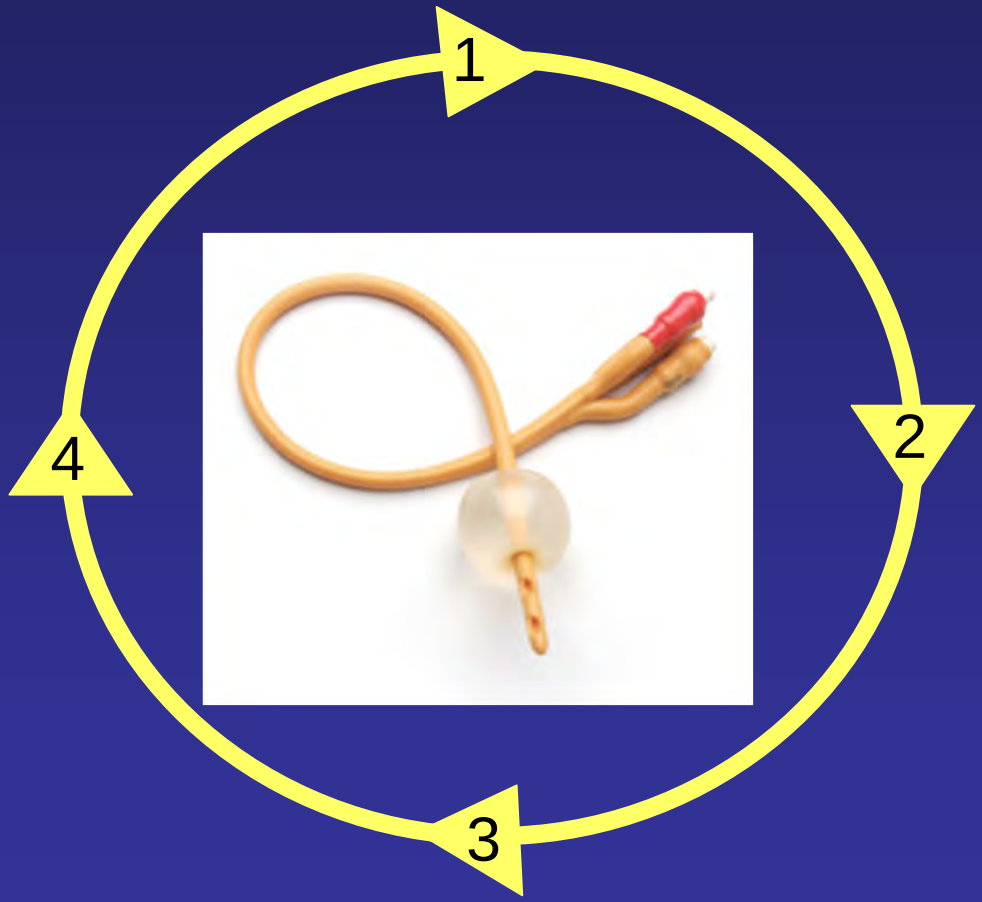

2. Maintaining Awareness & Proper Care of Catheters

3. Prompting Catheter Removal

4. Preventing Catheter Replacement

(Meddings. Clin Infect Dis 2011)

What about the ICU?

Just because a patient is in the ICU does NOT mean that the patient needs a Foley…

The Key Question is this:

Are hourly assessments of urine output required?

What if you need further help in preventing CAUTI?

Sarah Krein, PhD, RN

Polling Question

What strategies have you used or considered using if your CAUTI rates are not as low as you might like?

1. Running up and down the hallway screaming
2. Conducting a focused review or “deeper dive” to identify improvement opportunities
3. Ensuring competency in insertion using aseptic technique
4. Assessing what indications are being used for catheter use
5. Talking with staff about possible barriers to prompt removal

Additional Approaches

1) Tier 1 & Tier 2
2) CAUTI GPS
3) Applying Mindfulness to CAUTI

Tier 1 Protocol: Use of Indwelling Urinary Catheter Kit

Assess daily the necessity of the indwelling catheter	Encourage use of alternatives to indwelling catheter	Use standard indwelling urinary catheter kit with pre-sealed junction	Ensure proper aseptic insertion technique	Follow maintenance and removal template for care and removal of the catheter	Measure CAUTI rates monthly

Monitor CAUTI rates closely. Proceed to Tier 2 if either of the following conditions are met over a period of 6 months:

1. **ICU** ≥ 9 CAUTIs/10,000 patient days
   2 CAUTIs/1,000 catheter days
2. **Non-ICU, Acute Care** ≥ 3 CAUTIs/10,000 pt days & 2 CAUTIs/1,000 catheter days

Tier 2 Protocol: Enhanced Practices – Evaluation of indication for use, maintenance, and removal technique

Assess and document competency of health care workers performing insertion	Consider Root Cause Analysis or Focused Review of CAUTI or catheter use to identify improvement opportunities	Measure monthly for 6 months; re-evaluate. If rate has dropped below indicated levels proceed back to Tier 1	Sources: HICPAC CDC Guidelines on CAUTI Prevention www.catheterout.org

(Department of Veterans Affairs, VISN 11)

Additional Approaches

1) Tier 1 & Tier 2
2) CAUTI GPS
3) Applying Mindfulness to CAUTI

CAUTI Guide to Patient Safety (GPS) Purpose

- Brief, trouble-shooting guide
- Help identify the key reasons why hospitals may not be successful in preventing CAUTI
- Once the barriers are identified, can then help identify possible solutions

CAUTI Guide to Patient Safety (GPS) Development

- Understanding why some hospitals are better than others in preventing infection
  - Mixed-methods national studies focusing on three device-related infections: CAUTI, CLABSI and VAP
  - Funded by VA, NIH and AHRQ
  - Phone interviews and site visits to hospitals across the United States


Houghton
Marquette
Sault Ste Marie
Ironwood
Mackinac Island
Escanaba
Alpena
Traverse City
Ludington
Muskegon
Bay City
Grand Rapids
Lansing
Port Huron
Flint
Holland
Kalamazoo
Ann Arbor
Detroit


TAXI


Cape Air


MAINE
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04

CAUTI Guide to Patient Safety (GPS) Development

- Site visits require considerable time and resources
- A tool that hospitals can self-administer to identify potential challenges and receive feedback including strategies for improvement
- First step is the CAUTI GPS brief assessment

CAUTI GUIDE TO PATIENT SAFETY (GPS)

Question 1:
Do you currently have a well-functioning team (or work group) focusing on CAUTI prevention?
Yes No

Question 2:
Do you have a project manager with dedicated time to coordinate your CAUTI prevention activities?
Yes No

Question 3:
Do you have an effective nurse champion for your CAUTI prevention activities?
Yes No

Question 4:
Do bedside nurses assess, at least daily, whether their catheterized patients still need a urinary catheter?
Yes No

Question 5:
Do bedside nurses take initiative to ensure the indwelling urinary catheter is removed when the catheter is no longer needed (e.g., by contacting the physician or removing the catheter per protocol)?
Yes No

Question 6:
Do you have an effective physician champion for your CAUTI prevention activities?
Yes No

Question 7:
Is senior leadership supportive of CAUTI prevention activities?
Yes No

Question 8:
Do you currently collect CAUTI-related data (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates) in the unit(s) in which you are intervening?
Yes No

Question 9:
Do you routinely feedback CAUTI-related data to frontline staff (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates)?
Yes No

Question 10:
Have you experienced any of the following barriers?
A. Substantial nursing resistance
Yes No
B. Substantial physician resistance
Yes No
C. Patient and family requests for an indwelling urinary catheter
Yes No
D. Indwelling urinary catheters commonly being inserted in the emergency department without an appropriate indication
Yes No

CAUTI Guide to Patient Safety (GPS) Development

- Online tool
- Each question linked to trouble-shooting tips

www.catheterout.org

Question 2: Do you have a project manager with dedicated time to coordinate your CAUTI prevention activities

You indicated that you have a project manager who has dedicated time to work on the CAUTI prevention efforts. This is important to keep the project moving forward in a timely manner and to recognize and address barriers and challenges as they come up. As s/he becomes involved with other projects make sure that time on this project remains protected.

Question 3: Do you have an effective nurse champion for your CAUTI prevention activities?

You indicated that you have an effective nurse champion. This is key to the success of the initiative because it depends heavily on the nursing staff, especially those on the frontline. It is important that s/he remains engaged with the project as other projects come along, and if expanding the CAUTI prevention initiative to other units it is important to reassess if the current nurse champion is the best fit for these other units.!

Question 4: Do bedside nurses assess, at least daily, whether their catheterized patients still need a urinary catheter?

You indicated that nurses do not assess, at least daily, the continued appropriateness of the indwelling urinary catheter. Throughout a patient's stay their need for the indwelling catheter is likely to change. Without continual reassessment for appropriateness, the catheter is likely to stay in beyond its necessity, the greatest risk for infection. For more specifics, please follow **this link.**

Question 5: Do bedside nurses take initiative to ensure the indwelling urinary catheter is removed when the catheter is no longer needed (e.g., by contacting the physician or removing the catheter per protocol)?

You indicated that bedside nurses do not take initiative to remove catheters when they are no longer appropriate. The number one risk factor for CAUTI is leaving the indwelling catheter in too long. If a nurse determines that a catheter is no longer appropriate, there must be a procedure in place to have it removed in a timely manner. Depending on the unit and hospital there are a variety of ways this can be accomplished. For more specifics, please follow **this link.**

Question 6: Do you have an effective physician champion for your CAUTI prevention activities?

You indicated that you either do not have a physician champion or that the one you have is not effective. A successful CAUTI prevention initiative usually requires collaboration and cooperation between nurses and physicians. A physician champion is needed to bring the program to the other physicians, to help engage them, and to be a part of problem-solving when there is resistance or another challenge from this group of healthcare providers. For more specifics, please follow **this link.**

Question 7: Is senior leadership supportive of CAUTI prevention activities?

You indicated that senior leadership is supportive of the CAUTI initiative. It is important to occasionally reassess this as new initiatives and priorities are constantly being introduced.

Question 8: Do you currently collect CAUTI-related data (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates) in the unit(s) in which you are intervening?

You indicated that you currently collect CAUTI-related data. It is important to collect these measures as the project continues and once you have entered in to the sustainability phase. Discuss with the CAUTI prevention team if there are other measures that would be helpful to collect.

Question 9: Do you routinely feedback CAUTI-related data to frontline staff (e.g., urinary catheter prevalence, urinary catheter appropriateness, and infection rates)?

You indicated that you do not routinely feedback CAUTI-related data to frontline staff. While collecting CAUTI-related data is key to measuring the success of the intervention, it is imperative that the staff, especially those on the frontline are aware of it. The data can help motivate and engage the staff at all stages of the project, as well as encourage them to continue the changes for sustainability. For more specifics, please follow **this link.**

Question 10A: Have you experienced substantial nursing resistance?

You indicated that nursing resistance is a barrier that you face. Because the CAUTI prevention initiative relies heavily on their engagement it is imperative that you overcome this challenge. This is where an effective nurse champion is especially key. For more specifics, please follow **this link.**

Question 10B: Have you experienced substantial physician resistance?

You have indicated that you have not experienced significant resistance from the physicians in your unit/at your hospital. Despite the fact that the initiative relies heavily on nursing, resistance from physicians can be challenging, particularly in the decisions for insertion and the timely order for removal. As there are changes to staffing and the spread of the initiative beyond one unit, it is key to keep ongoing communication with physicians.

Because timely removal of the indwelling urinary catheter is crucial for reducing catheter-associated urinary tract infection (CAUTI), nurses should be empowered and supported to take the initiative to remove the catheter when it is no longer appropriate (e.g., by contacting the physician or removing the catheter per approved protocol).

1. Policy to trigger prompt removal is key
   - **Stop orders** which prompt the clinician to remove the catheter by default after a certain time period or a set of clinical conditions has occurred (such as 24 or 48 hours post-operative) unless the catheter remains clinically appropriate.
     - Stop orders "expire" in the same fashion as restraint orders or antibiotic orders, unless action is taken by physicians.
   - **Urinary catheter reminders** simply alert doctors and bedside nurses to the fact that a Foley is being used by a patient and provide a list of the appropriate reasons to continue or discontinue the indwelling catheter.
     - Reminders are generally dispatched as a hospital unit eases into an infection prevention initiative.
     - The reminder is included in the patient's chart or is part of the patient's electronic record.
   - The use of **daily appropriateness tracking** can be helpful for decreasing unnecessary indwelling urinary catheters. Bedside nurses make a daily entry indicating whether any given Foley meets one or more of the appropriate indications for catheter use. If an in-place catheter fails that test, the nurse is to alert the appropriate physician caring for the patient and recommend the catheter's removal.
   - Some hospitals have had great success with a **nurse-initiated removal protocol** whereby a bedside nurse can initiate the removal of the indwelling urinary catheter without an attending physician order; however, this usually needs to be approved by a Medical Executive Committee first, and should be presented by a physician.

GPS Validation Study

Kathlyn Fletcher, MD, PhD

- Goals
  1) To assess the unit-level culture surrounding the prevention of CAUTI and other hospital-acquired conditions
  2) To compare the CAUTI GPS survey answers to qualitatively derived site assessments
     - Today's focus

Methods: Overview

- Setting: Four academic institutions
  - Two units per site (one MICU and one other unit)
- Participants
  - Nurse manager, staff nurses, physicians, hospital leadership
- Data collection
  - Nurse manager completed GPS and then was interviewed
  - Others were interviewed using more open-ended questions
  - Observations on the involved wards

Methods (cont'd)

- Analysis
  - Inductive coding to define the culture
  - Deductive coding to identify elements/answers to the GPS
  - Comparison of nurse manager's answers to others
  - Other comparisons for today…
    - Comparison of senior leadership to unit
    - Comparison of RNs to MDs

Get on the Same Page: Senior Leadership

- Our observation
  - Infection control/quality officers are not always on the same page with nurse managers
- Examples
  - Institutional versus unit-level champions
  - Actual preventive practices that are in place
  - How data is given to the front lines
- Ideas
  - Ask the infection control professional or quality officer to take the GPS with your unit in mind

Get on the Same Page: Nurses and Doctors

- Our observation
  - Doctors often have no idea about formal CAUTI prevention practices on their units
- Examples
  - Doctors have no idea what the nurses do with respect to CAUTI prevention
  - MDs often aren't aware of the existence of champions
- Ideas
  - Have MDs take the GPS
  - Aggressively educate them based on gaps

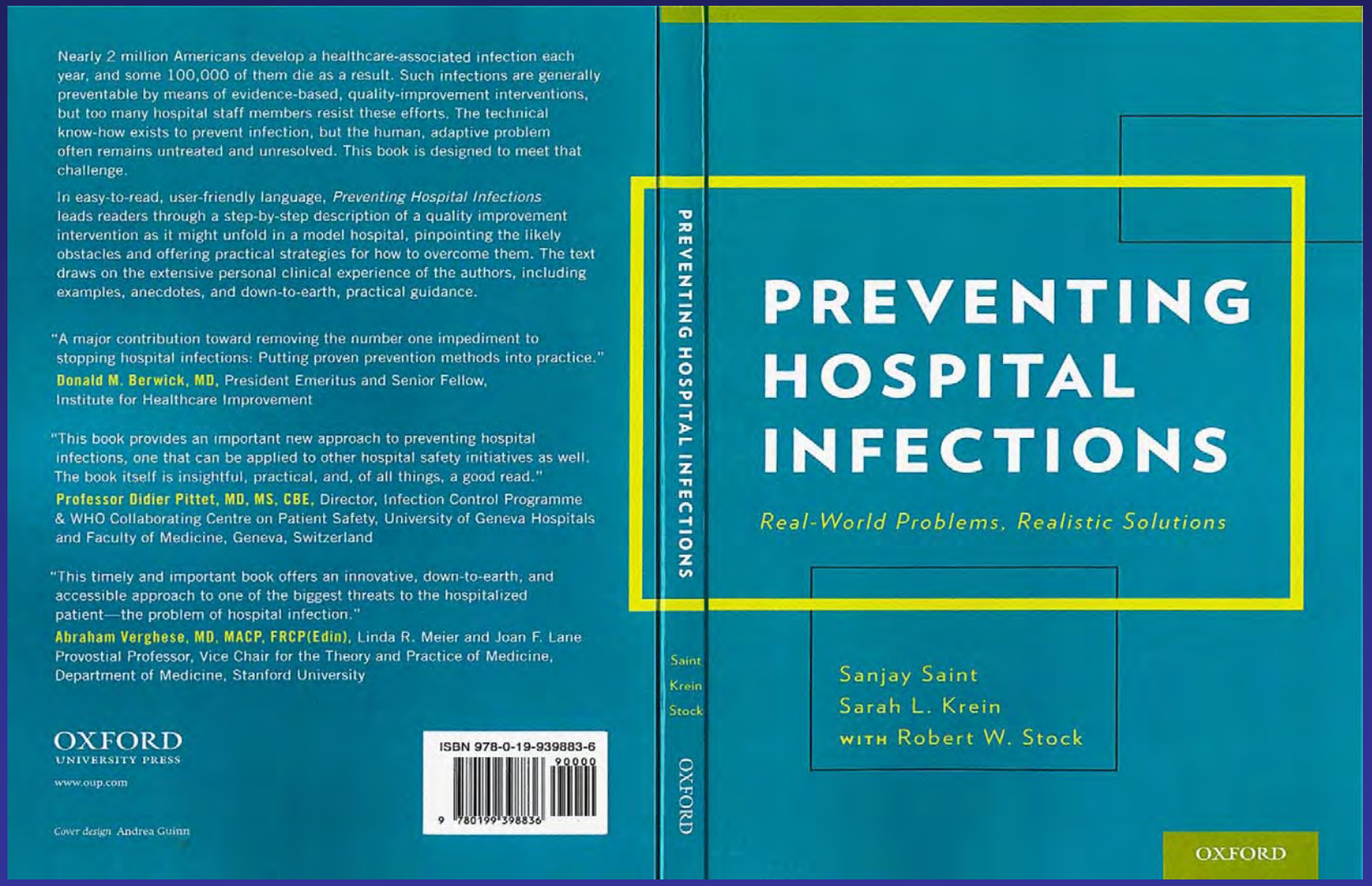
Physician Involvement

- Our observation
  - Often physicians are only passively involved in efforts
- Examples
  - Most agree that physicians aren't totally on board
  - Few think that they are an actual barrier
- Ideas
  - There is room for more active partnering with MDs to move the dial toward "fully embrace"

Share the Outcomes Data

- Our observation
  - Data is not consistently getting to the front-line MDs or RNs
- Examples
  - Many know that data is collected
  - Few know how it is used or even see the results
- Ideas
  - Use questions 8 and 9 with MDs and RNs
  - If this is true for your unit, reassess feedback mechanism

Other Resources…



Nearly 2 million Americans develop a healthcare-associated infection each year, and some 100,000 of them die as a result. Such infections are generally preventable by means of evidence-based, quality-improvement interventions, but too many hospital staff members resist these efforts. The technical know-how exists to prevent infection, but the human, adaptive problem often remains untreated and unresolved. This book is designed to meet that challenge.

In easy-to-read, user-friendly language, *Preventing Hospital Infections* leads readers through a step-by-step description of a quality improvement intervention as it might unfold in a model hospital, pinpointing the likely obstacles and offering practical strategies for how to overcome them. The text draws on the extensive personal clinical experience of the authors, including examples, anecdotes, and down-to-earth, practical guidance.

"A major contribution toward removing the number one impediment to stopping hospital infections: Putting proven prevention methods into practice."
Donald M. Berwick, MD, President Emeritus and Senior Fellow, Institute for Healthcare Improvement

"This book provides an important new approach to preventing hospital infections, one that can be applied to other hospital safety initiatives as well. The book itself is insightful, practical, and, of all things, a good read."
Professor Didier Pittet, MD, MS, CBE, Director, Infection Control Programme & WHO Collaborating Centre on Patient Safety, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland

"This timely and important book offers an innovative, down-to-earth, and accessible approach to one of the biggest threats to the hospitalized patient—the problem of hospital infection."
Abraham Verghese, MD, MACP, FRCP(Edin), Linda R. Meier and Joan F. Lane Provostial Professor, Vice Chair for the Theory and Practice of Medicine, Department of Medicine, Stanford University

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PREVENTING HOSPITAL INFECTIONS

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PREVENTING HOSPITAL INFECTIONS

Real-World Problems, Realistic Solutions

Sanjay Saint
Sarah L. Krein
WITH Robert W. Stock

OXFORD

Additional Approaches

Sanjay Saint, MD, PhD

1) Tier 1 & Tier 2

2) CAUTI GPS

3) Applying Mindfulness to CAUTI

A Dilemma

- Much of what we do in health care – especially in the hospital – is reflexive
  - If a patient is hypoxemic: we give oxygen
  - Low BP: IV fluids
  - Positive blood cultures: antibiotics
  - Frequency, urgency, and dysuria: dx UTI

A Dilemma

- These rote responses are usually helpful
- However, this reflex-like approach can lead to problems
  - Patient sick enough to be admitted from the ED: Foley catheter
  - Asymptomatic catheterized patient has a “dirty” urine: antibiotics

One Possible Solution: "Medical Mindfulness"

One Possible Solution: "Medical Mindfulness"

- Being in the moment and considering decisions carefully before jumping to reflexive action
- Daniel Kahneman:
  - Intuition (System 1): fast, automatic, effortless and difficult to alter
  - Reasoning (System 2): slower, effortful and flexible
- In medicine, we are constantly toggling back-and-forth between the reflexive and the complex
- How can we apply this to everyday practice?

Applying Mindfulness to Bedside Nursing: Catheter-Associated Urinary Tract Infection

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

- Taking a 5-second "pause" before…
  - Inserting an indwelling catheter
  - Emptying the drainage bag or transporting the patient
- Asking…
  - Is it absolutely necessary to use an indwelling catheter in this patient? Can I use an alternative?
  - Am I using proper technique? Do I need to ask for help? Can the catheter be removed today?

Conclusions

- CAUTI and indwelling catheter use are important patient safety issues
- Proven approaches to reduce catheter use: prevent CAUTI and other patient safety problems
- Additional approaches if still unhappy with your CAUTI rates: Tiered approach, GPS, mindfulness
- Thank you for your work on behalf of patients

Thank you!

www.catheterout.org

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On the CUSP: Stop CAUTI

Sustainability for CAUTI Prevention Efforts

Mohamad Fakih, MD, MPH

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What is Sustainability?

(Shediac-Rizkallah and Bone, Health Educ Res 1998; 13: 87-108)

- Desired health benefits are maintained or improved
- The innovation loses its separate identity and becomes part of regular activities (institutionalization)
- Hospital staff provide ongoing support and expertise (building capacity)

Planning for Sustainability

- Identify required resources needed: technical support (EMR), FTE support
- Identify mechanisms for integration of the process into daily work flow
- Identify the team that will be accountable for sustaining the work: **who** is in charge and **how** will the improvements be done?

Factors that Influence Sustainability

1. Effectiveness
2. Institutionalization (routinization and integration with existing programs/services)
3. Building capacity: (program champions/leadership)
4. Context (internal and external environment)

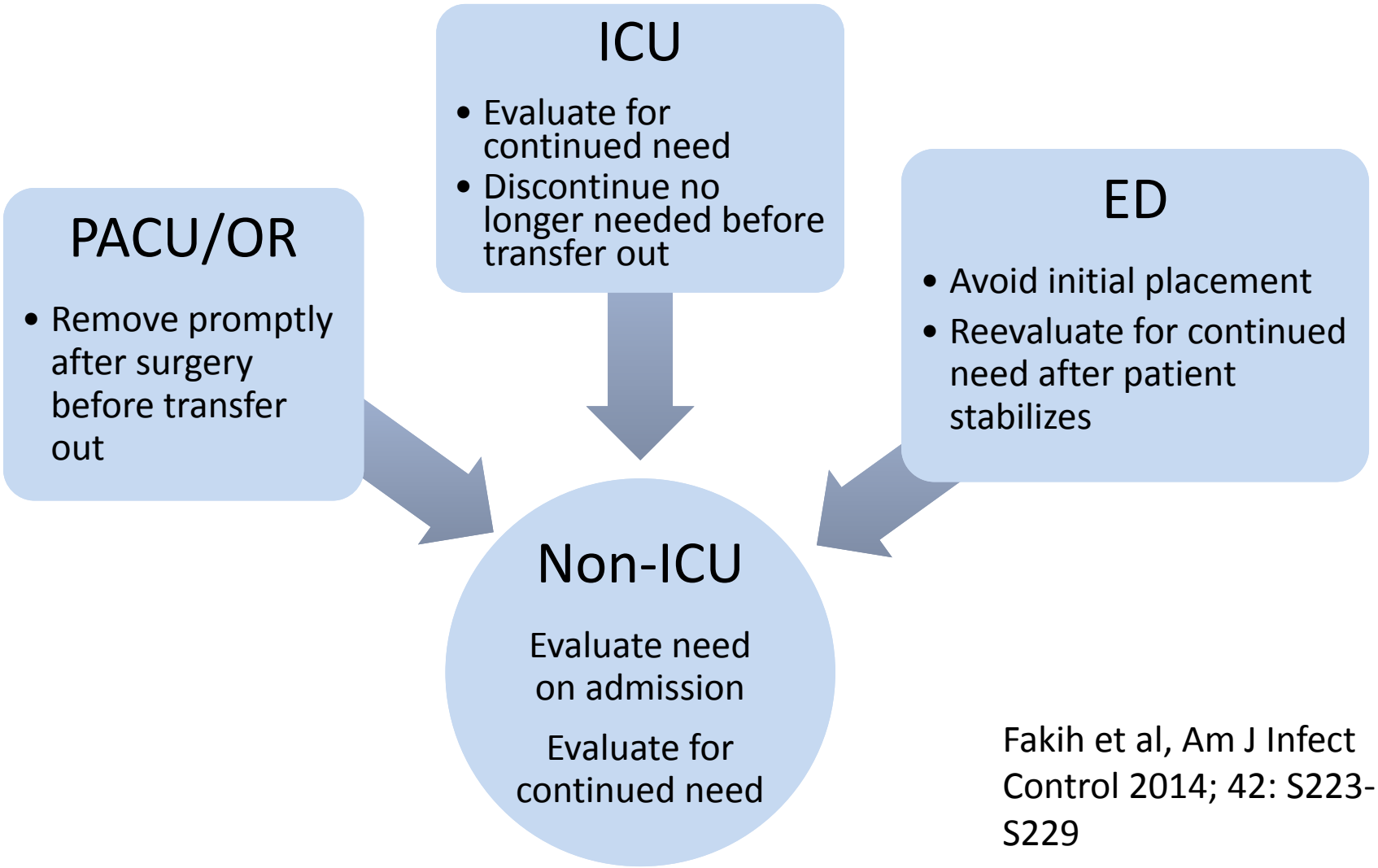
1. Effectiveness

a. Process should be effective and perceived to be by healthcare workers (accepted)
b. The program fits with the organization and **flexible** enough to allow future modifications
   (Wiltsey et al, Implement Sci 2012; **7**:17)
c. Regular monitoring/evaluation and feedback
d. Expanding the effort by also focusing on other areas (intrainstitutional spread)

Regular Evaluation and Feedback

- Evaluation of device use and event rates and to identify new or ongoing gaps for intervention
  - point prevalence: urinary catheter use and appropriateness: a snap shot of use over time, highlights the importance of keeping event prevention a priority
  - event rates: reflect outcomes (harms): CAUTI, trauma related to the catheter, pressure ulcer

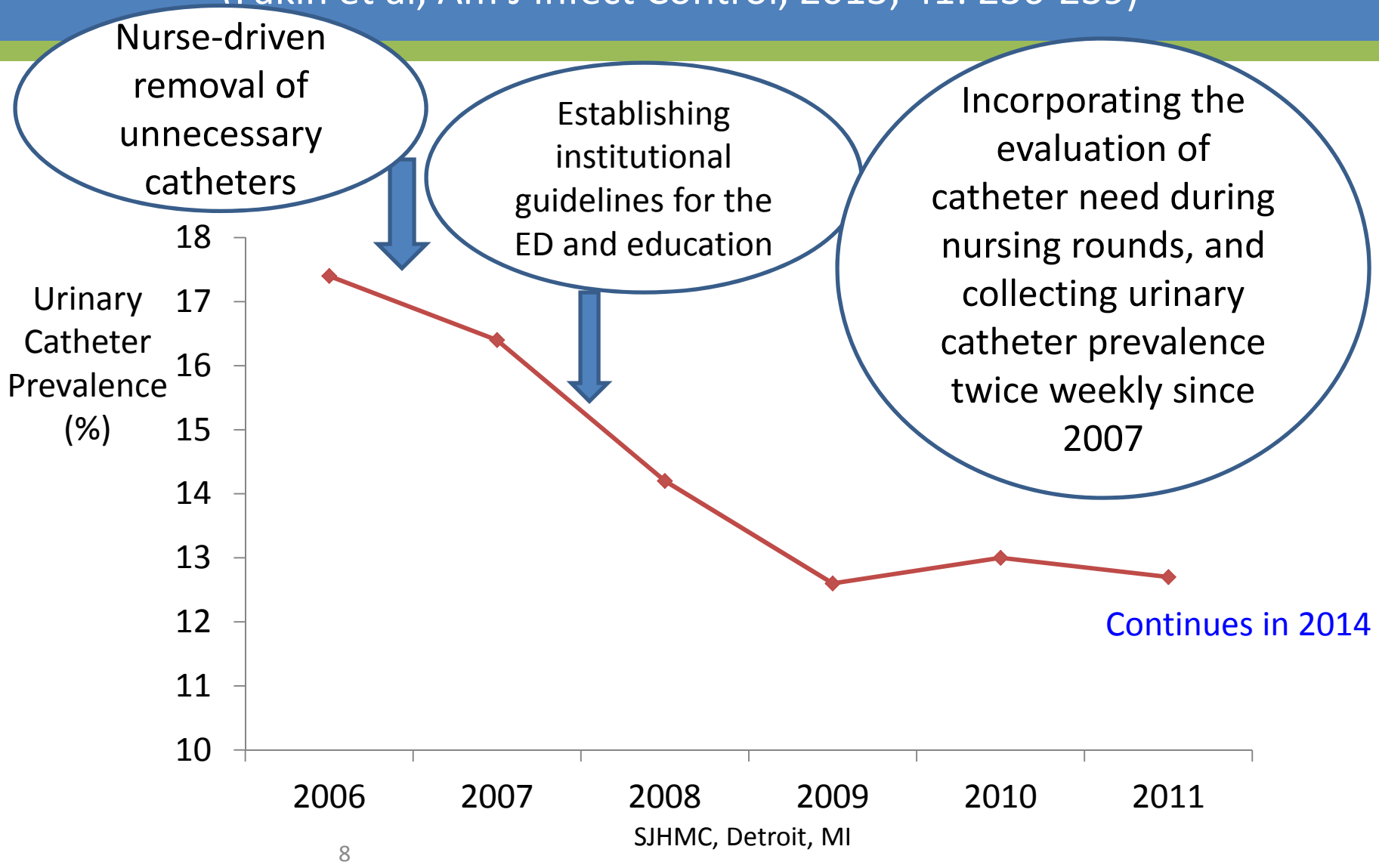
Improvement in Urinary Catheter Use: Multidisciplinary and Multi-departmental Efforts



Fakih et al, Am J Infect Control 2014; 42: S223-S229

Sustaining Gains with Interventions

(Fakih et al, Am J Infect Control, 2013; 41: 236-239)



2. Institutionalization

- The program becomes a part of the standard of care in the hospital (only place the catheter based on appropriate indication, comply with proper insertion and maintenance, daily evaluation for need and removal when no longer needed)
- With time, modifications of the program may occur based on new evidence

Institutionalization (Routinization and Integration)

- Alignment with the organization's goals (promoting safety): **leadership** + the Board regularly reviews the outcomes to keep the work as a priority
- Policies and standard operating procedures: policies based on best practices (already addressed during implementation), and shared with healthcare workers

Institutionalization (Routinization and Integration)

- Regular education: this may be done electronically or through champions
- Competencies: urinary catheter placement and management, keep healthcare workers updated on the best practices

Institutionalization (Routinization and Integration)

- Healthcare worker **daily routine**: incorporate it into the workflow (imagine taking vitals, do we forget?)
- Use of electronic medical records: incorporate into order sets, and build reminders or triggers.

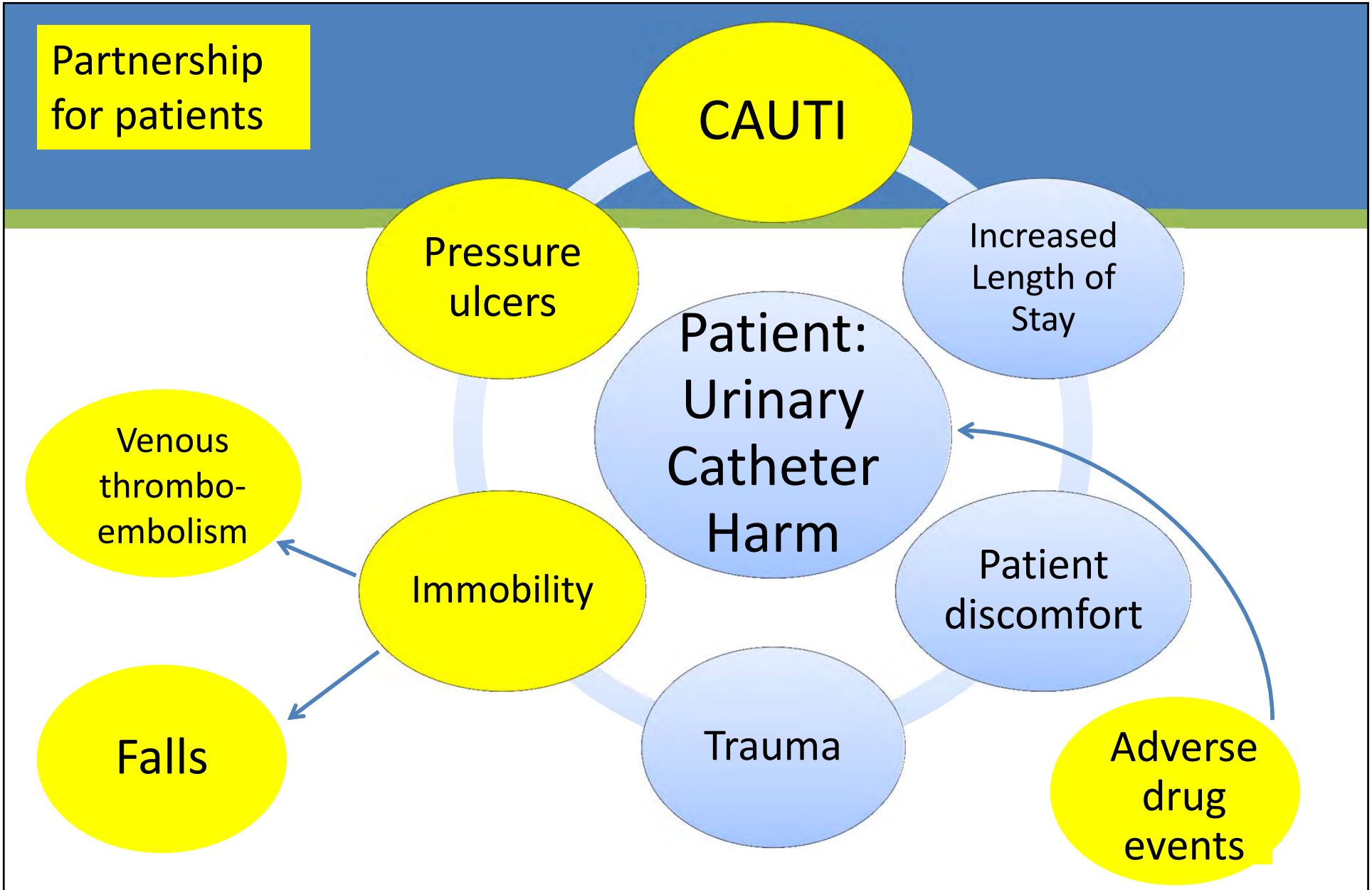
And the nurses own the catheter…

	Bedside nurses (n = 229)
Who on unit is responsible to verify if a urinary catheter is needed?	
Nurse caring for patient	78/227 (34.4)
Case manager	4/227 (1.8)
Nurse manager	1/227 (0.4)
Nurse caring for patient and case manager	36/227 (15.9)
Nurse caring for patient, case manager, and nurse manager	108/227 (47.6)
How often does the nursing unit evaluate urinary catheter presence and appropriate need?	
Once per week	2/227 (0.9)
Tuesday and Thursday only	19/227 (8.4)
3 times per week	0/227
4 times a week	1/227 (0.4)
Daily	205/227 (90.3)
Evaluating the urinary catheter presence and need is usually done during…	
Morning shift	38/228 (16.7)
Night shift	0/228
All shifts	190/228 (83.3)

Fakih et al, Am J Infect Control 2013; 41: 236-239

3. Building Capacity

- Continued funding (difficult to keep)
- Collaboration between different stakeholders in the organization (significant support)
- Workforce turnover (negative effect)



Different harms are connected: Multiple stakeholders need to work together

The Champions (Physicians/Nurses)

- Identified during implementation
- Keeps the effort as a priority during sustainability
- Provide expertise in the topic
- Liaison with peers to promote best practice to reduce CAUTI risk

The team: the Supporters

- Help facilitate the champion's work
- Point out any barriers or concerns: important to address to keep process successful
- Help build capacity to sustain effort
- Keep the process alive if the champion leaves

Table 2
Disciplines and specialties and their incentives to support minimizing urinary catheter harm

Discipline or specialty	Urinary catheter harm
Hospital epidemiology, infection prevention, and infectious diseases	Infectious complications: CAUTI, multidrug resistance, *C difficile* infection, and improve antimicrobial stewardship
Urology	Mechanical complications: hematuria, meatal and urethral injury
Geriatric medicine	Infectious and noninfectious complications: significant proportion of inappropriate catheterization in older adults, leading to increased immobility and deconditioning risk, in addition to infection and trauma
Hospital medicine	Infectious and noninfectious complications: hospitalists care for a large number of patients; their support may significantly improve the appropriate use of urinary catheters resulting also in shorter length of stay
Rehabilitation medicine and physical therapy	Urinary catheter impedes mobility (1-point restraint), and may be associated with an increased risk of falls
Wound ostomy services	Urinary catheter use increases immobility, which in turn results in an increased risk of pressure ulcers; wound care nurses may help in advising the bedside nurse on methods to reduce skin breakdown in patients with incontinence without using urinary catheters
Surgery	Avoid postoperative complications: the surgeons need to comply with the Surgical Care Improvement Project recommendations to remove catheters by postoperative day 1 or 2; inappropriate urinary catheter use postoperatively will negatively affect the surgeon's profile
Intensive care nurses and physicians	CAUTI is publicly reported in the ICUs; the ICU has the highest prevalence of urinary catheter use compared with other hospital units; opportunities to reduce urinary catheter use exist through daily evaluation of need and on transfer from the ICU to floor
Emergency medicine nurses and physicians	ED represents the point of entry to more than half of the patients admitted to the hospital; unnecessary urinary catheter placement is common in the ED, and promoting appropriate placement will affect use hospital-wide
Administrative leaders	Inappropriate urinary catheter use subjects the patient to preventable safety risk; in addition, the Centers for Medicare and Medicaid Services have stopped compensation for hospital-acquired conditions; moreover, CAUTIs are publicly reported and are tied to value-based purchasing and hospital-acquired condition payment penalty

ED, emergency department; *ICU*, intensive care unit.

Fakih et al, Am J Infect Control 2014; 42: S223-S229

What about bundling it as a device safety issue? More patient centered: Build capacity through incorporating it into the work on other devices

A. Sample of the Device Risk Evaluation Tool

DEVICE RISK EVALUATION TOOL

Date: _____ Unit: _____ Room/Bed: _____

DEVICE			ACTION TAKEN (IF NECESSARY)
Urinary Catheter			
If "no," describe action taken.			
Catheter secured?	Yes	No	
Bag below bladder?	Yes	No	
Appropriately indicated?†	Yes	No	
Mechanical Ventilation			
If "no," describe action taken.			
Head of bed elevated ≥ 30°?	Yes	No	
Evaluated for a weaning trial today?	Yes	No	
Peripheral Venous Catheter			
If "no," describe action taken.			
Dressing intact?	Yes	No	
Site: no redness or drainage?	Yes	No	
Need: line still necessary?	Yes	No	
Central Venous Catheter (CVC)			
If "no," describe action taken.			
Dressing intact?	Yes	No	
Site: dry and no erythema?	Yes	No	
Need: line still necessary?	Yes	No	
Special attention required for the following CVCs. If "yes," describe action taken.			
Emergently-placed line?*	Yes	No	
Femoral line?*	Yes	No	

**Femoral lines or emergently-placed (not aseptically) lines need to be promptly removed to reduce infection risk.*

†The appropriate indications for urinary catheter include: urinary flow obstruction or retention, perioperative use in selected surgeries, need for prolonged immobilization, monitoring fluids in critically ill patients, assist healing of sacral and perineal wounds in those with incontinence, or improve comfort at end of life care.

Context (Internal and External Environment)

(Krein et al, Soc Sci Med 2010; 71: 1692-1701)

- Internal environment: organization geared towards quality and safety, leaders adopting best practices, employee satisfaction and morale
- External environment:

1. Public reporting, value based purchasing, and hospital acquired condition penalties
2. National efforts: “Partnership for Patients”, SCIP
3. Incentives of payers
4. State efforts

External Environment

- Hospital-wide reporting of urinary catheter use and CAUTI (starts Jan 2015)
- Hospital acquired conditions reduction penalties: CAUTI outcomes linked to a reduction of 1% of CMS payments
- Infrastructure built through “On the CUSP Stop CAUTI” to engage specialty societies and State hospital organizations

Questions?

- How do we ensure the momentum persists at a national level when the funding for the project ends?
- How do we use the infrastructure built to keep the improvements?
- What about the ICUs? Work is still needed to improve their CAUTI outcomes