Best Practices for CAUTI Prevention; Reliability, Sustainability and Spread

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Historically – No Respect for CAUTIs
Epidemiology

- Urinary catheters are frequently used in the hospital setting and LTC setting.
- The presence of the indwelling urinary catheter increases the risk of urinary tract infections.
- Hospital-acquired bacteriuria and candiduria in 25% of those with urinary catheters placed for a week.
- About 15 - 25% of patients will have a urinary catheter placed during their hospitalization.
Current Status

• CMS reportable in ICU, Rehab, LTACH

• Recent CDC report – increase in CAUTI in ICU since 2010

• CDC calls for a “call to action”

• Associated with C _difficile_ and other non infectious complications
Understanding Technology and Culture

Technical vs. Socio adaptive issues

• Require a change of values, attitudes or beliefs
• “Behavior based”
• Examples:
  – Engagement
  – Execution

CUSP is one of the behavioral interventions we use to help teams address Adaptive Challenges
The Work is just Beginning

The Marriage of the Technical and Socio-adaptive Aspects of Health Care

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Centers for Disease Control and Prevention
Atlanta, GA
### Table 2.
**A. Examples of Appropriate Indications for Indwelling Urethral Catheter Use**

<table>
<thead>
<tr>
<th>Indications</th>
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</thead>
<tbody>
<tr>
<td>Patient has acute urinary retention or bladder outlet obstruction</td>
</tr>
<tr>
<td>Need for accurate measurements of urinary output in critically ill patients</td>
</tr>
<tr>
<td>Perioperative use for selected surgical procedures:</td>
</tr>
<tr>
<td>- Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract</td>
</tr>
<tr>
<td>- Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)</td>
</tr>
<tr>
<td>- Patients anticipated to receive large-volume infusions or diuretics during surgery</td>
</tr>
<tr>
<td>- Need for intraoperative monitoring of urinary output</td>
</tr>
<tr>
<td>To assist in healing of open sacral or perineal wounds in incontinent patients</td>
</tr>
<tr>
<td>Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)</td>
</tr>
<tr>
<td>To improve comfort for end of life care if needed</td>
</tr>
</tbody>
</table>

### 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.
• What is a critically ill patient?

• Do all ICU patients require a catheter?

• Do all surgery patients need a catheter?

• Are there opportunities to minimize use?
Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals

Daleyn Le, MD; Lindsey Nicolls, MD; David Chasan, MD; MG; Kathleen M. Arias, MS, CIC; Kelly Podger, RN, MS, CPHQ; Dewitric J. Anderson, MD, MPH; Hector Bustos, MD; David P. Caffo, MD, MS; Susan E. Coffin, MD, MPH; Erik R. Dubberke, MD; Victoria furnace, MD; Dale N. Gerding, MD; Frances A. Griffin, EIT, MP; Peter Cera, MD; Kiah S. Kyes, MD; Michael Klomp, MD; Jonah Marshall, MD; Leonard A. Meruelo, DO, SCU; David A. Flagg, MD; Yith M. Peral, MD; Sandy Sait, MD; Cassandra D. Salgado, MD, MS; Robert A. Waldstein, 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 urinary catheter.1
   b. Twelve to sixteen percent of hospital patients will have a urinary catheter at some time during their hospital stay.2

2. Outcomes associated with CAUTI
   a. Urinary tract infections are the most important adverse outcome of urinary catheter use. Bacteremia and sepsis may occur in a small proportion of infected patients.4,5
   b. Morbidity attributable to any single episode of catheterization is limited, but the high frequency of catheter use in hospitalized patients means that the cumulative burden of CAUTI is substantial.4,5
   c. Catheter use is also associated with negative outcomes other than infection, including nonbacterial urothelial inflammation,6,7 urothelial strictures,6 mechanical trauma.

3. Risk factors for development of CAUTI
   a. The duration of catheterization is the most important risk factor for development of infection.3,8 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 Manhita, Wurzburg, Canada (E.L., L.H.); the University of Utah, Salt Lake City (D.C.); the Association for Professionals in Infection Control and Epidemiology (A.P.I.E.) and the National Quality Forum (N.Q.F., Washington, D.C.); the Joint Commission, Oakbrook Terrace (P.F., R.N.); Loyola University Chicago Stritch School of Medicine (D.M.C.) and the Harlem (Cook County) Hospital and Rush University Medical Center (R.A.N.), Chicago, and the Veterans Affairs Medical Center, Hines (D.M.C.), Illinois; the Duke University Medical Center, Durham, North Carolina (D.I.A., K.S.E.); the Mount Sinai School of Medicine, New York, New York (D.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 (J.R.D., V.P., J.M.); the Institute for Healthcare Improvement, Cambridge (P.A.C.); and St. John’s Women’s Hospital and Harvard Medical School, Boston (D.J.Y. M.K.), Massachusetts; the Harvard University Medical Center, Boston (A.L.M.C., and the University of Medicine and Dentistry—New Jersey Medical School, Newark (R.C.), New Jersey; the University of New Mexico School of Medicine and the University of New Mexico School of Medicine (L.A.P.); the Johns Hopkins Medical Institutions and University, Baltimore, Maryland (J.A.J., T.M.F.); 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 (G.C.S.), Significance of the study:}.
Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America

Guidelines for the diagnosis, prevention, and management of persons with catheter-associated urinary tract infection (CAUTI), both symptomatic and asymptomatic, were prepared by an Expert Panel of the Infections Diseases Society of America. The evidence-based guidelines encompass diagnostic criteria, strategies to reduce the risk of CAUTIs, 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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James Marx, RN, MS, CIC
Shannon Oriola, RN, CIC, COHN
Core CAUTI Prevention Strategies:

**Catheter Use**
- Insert catheters only for appropriate indications
- Leave catheters in place only as long as needed

**Insertion**
- Ensure that only properly trained persons insert and maintain catheters
- Insert catheters using aseptic technique and sterile equipment (acute care setting)

**Maintenance**
- Following aseptic insertion, maintain a closed drainage system
- Maintain unobstructed urine flow

Hand hygiene and Standard Precautions

[http://www.cdc.gov/hicpac/cauti/001_cauti.html](http://www.cdc.gov/hicpac/cauti/001_cauti.html)
“Bladder Bundle”

• **A**septic insertion and proper maintenance is paramount

• **B**ladder ultrasound may avoid indwelling catheterization

• **C**ondom or intermittent catheterization in appropriate pts

• **D**o not use the indwelling catheter unless you must!

• **E**arly removal of the catheter using reminders or stop-orders appears warranted
Best Practices

A system of alerts to identify patients with a catheter and reminders when the catheter is no longer needed
The Use of the Electronic Health Record

Check Foley Catheter

This patient has a Foley Catheter that was inserted more than 2 days ago. Please check to see if this Foley Catheter can be discontinued.
Efficacy of Enhancing Catheter Awareness;

Rate of CAUTI can be reduced by half with use of catheter reminder or stop order.
Protocols

- Guidelines and protocols for nurse-directed removal of unnecessary urinary catheters

- Protocols for management of postoperative urinary retention, such as nurse-directed use of intermittent catheterization and use of bladder ultrasound scanners
Life Cycle of a Catheter
Urinary Catheter Removal Protocol for MICU/MAT

Purpose: Reduce catheter associated urinary tract infections (CAUTI) by expediting removal of urinary catheters

Procedure:
1. Assess the need to continue the urinary catheter daily using the nurse driven urinary catheter criteria (see page 2).
2. If the patient no longer meets criteria for indwelling urinary catheter and no existing order to continue catheter exists, then the catheter will be discontinued before 12pm.
3. The nurse will educate patient/family on necessity of calling for assistance for toileting and importance of fluid intake as indicated.
4. After removal of the foley catheter, the patient will be assessed by the RN for the following parameters:
   o Patient is spontaneously voiding.
   o Patient is not voiding however is comfortable and expresses no desire to void.
   o Bladder scan if unable to void in 6 hours.
     - If < 400 ml, recheck every 4 hours until patient able to void.
     - If > 400 ml or patient uncomfortable, inform physician.
Strategies

Insertion
- Physician order
- Clear criteria for insertion
- Properly trained individuals

Maintenance
- Closed secure system
- Aseptic sampling
- No kinking

Removal
- Daily rounding
- Standard post op orders
Where are Urinary Catheters Placed and Cared for

Best Practices
- Rounding
- Observations

What about the ED?
Who gets a urinary catheter?
Does every patient going to ICU need a catheter?

What about surgery?
Cath lab?
Patients with spinal anesthesia?
Best Practices

- Engage
- Evaluate
- Educate
- Execute
Engage

Form Multidisciplinary Group:

Physicians
Nursing
ID/ Epidemiology
Pharmacy – Stewardship Program
Infection Prevention
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.


5. Provide support from leadership for the efforts of the physician champion.
Nurse Engagement

Identify Barriers

- Sacred Cows – falls, prevention of pressure ulcers
- Patients of Size
- Combativeness
- Extreme frailty
- Patient request
Engagement Strategies

• Engage the Intellect with Science
  – Show them your hospital’s CAUTI rates
  – Show them what others have achieved—and how

• Engage their Caring Side
  – Preventable harm is not acceptable
  – Tell your own stories
  – A million deaths is a statistic
Engagement

Lessons learned from the “Tipping Point”

Different kinds of stakeholders:

- Mavens
- Salesmen
- Connectors
Adoption of Safety Practices

- Believe that it keeps patients safe
- Understand benefits
- Know consequences

Do nurses really believe that urinary catheters really can cause harm?
Urinary Catheter Harm

- CAUTI
- Increased Length of Stay
- Patient dignity*
- Trauma
- Immobility
- Pressure ulcers
- Venous thromboembolism?

*Saint S, Ann Intern Med 2002; 137: 125-7
Link to Mortality and Length of Stay

<table>
<thead>
<tr>
<th>Table 2. Univariate analysis of noninfectious urethral catheter related complications</th>
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<tbody>
<tr>
<td>Complications</td>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td>Absent</td>
</tr>
<tr>
<td>CABG:</td>
</tr>
<tr>
<td>Mean days LOS</td>
</tr>
<tr>
<td>UTI (%)</td>
</tr>
<tr>
<td>Mortality rate (%)</td>
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<tr>
<td>NonCABG cardiac:</td>
</tr>
<tr>
<td>Mean days LOS</td>
</tr>
<tr>
<td>UTI (%)</td>
</tr>
<tr>
<td>Mortality rate (%)</td>
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<tr>
<td>Hysterectomy:</td>
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<tr>
<td>Mean days LOS</td>
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<tr>
<td>UTI (%)</td>
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<tr>
<td>Mortality rate (%)</td>
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<td>Mean days LOS</td>
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<td>Major vascular:</td>
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<tr>
<td>Mean days LOS</td>
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<td>UTI (%)</td>
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<tr>
<td>Mortality rate (%)</td>
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</table>
Immobility has been identified as a risk factor in nursing home acute care hospitalizations

BMC Geriatrics 2008;8:31  Rodgers et al
<table>
<thead>
<tr>
<th>Setting</th>
<th>Strategy</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Department</td>
<td>Indication checklists, stickers attached to catheter kits</td>
<td>Gokula, 2005</td>
</tr>
<tr>
<td>Peri-Procedure</td>
<td>Procedure-specific protocols for catheter placement and post-op stop orders.</td>
<td>Stephan, 2006; Multiple genitourinary catheter protocol studies</td>
</tr>
<tr>
<td>ICU</td>
<td>Daily checklists used in multidisciplinary rounds</td>
<td>Dumigan, 1998; Jain, 2006; Reilly, 2008; Huang, 2004</td>
</tr>
<tr>
<td>Acute Care Units</td>
<td>Reminders vs. stop order written, verbal, electronic</td>
<td>Saint, 2005; Fakih, 2008; Topal, 2005; Crouzet, 2007; Apisarnthanarak, 2007</td>
</tr>
<tr>
<td>Acute Rehab Units</td>
<td>Use alternatives to indwelling urinary catheters Clean intermittent catheterization</td>
<td>HICPAC, 2009</td>
</tr>
</tbody>
</table>
Educate

Education and performance feedback regarding appropriate use, hand hygiene, and catheter care.

Competency – annual or at hire
Tools Used with Intervention

- Lecture for nurses
- Pocket cards, posters

**Remove That Urinary Catheter!**

**Urinary Catheters Increase:***
- Likelihood of infection
- Patient discomfort
- Antibiotic use
- Length of stay
- Cost

* Patients with urinary catheters are at increased risk of developing hospital-acquired infections and other complications.

**Urinary Catheters ARE indicated for:***
- Acute urinary retention or obstruction
- Perioperative use in selected surgeries
- Assist healing of perineal and sacral wounds in incontinent patients
- Hospice/comfort care/palliative care
- Required immobilization for trauma or surgery
- Chronic indwelling urinary catheter on admission

**Foley Catheters ARE NOT indicated for:***
- Urine output monitoring OUTSIDE intensive care
- Incontinence place or toileting routine
- Prolonged postoperative use
- Patients transferred from intensive care to general units
- Marital already
- Incontinence (urine output q2 hours, up in chair)
- Confusion or dementia

**Questions? Contact [Insert Info]**

**Does Your Patient REALLY NEED A URINARY CATHETER?**

**INDICATIONS FOR URINARY CATHETER USE INCLUDE:**
- Acute urinary retention or obstruction
- Perioperative use in selected surgeries
- Assist healing of perineal and sacral wounds in incontinent patients
- Hospice/comfort care/palliative care
- Required immobilization for trauma or surgery
- Chronic indwelling urinary catheter on admission

Any questions, please call [insert contact info]

**Remove That Urinary Catheter!**

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Back
Patient Education

FAQs 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

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 healthcare 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.
Reducing health care-associated infections (HAIs): Lessons learned from a national collaborative of regional HAI programs

Catherine Amber Welsh PhD a,b,s, Mindy E. Flanagan PhD a, Shawn C. Hoke BA c, Bradley N. Doebbeling MD, MSc a,c,d,e, Loreen Herwaldt MD f, for the Agency for Healthcare Research and Quality Hospital-Acquired Infections Collaborative g

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e Department of Medicine, Indiana University School of Medicine, Indianapolis, IN
f Department of Internal Medicine, University of Iowa, Iowa City, IA
Common Themes

1. Fostering Change – overcoming barrier
2. Communication- standardized processes and metrics
3. Local Focused implementation – implementation at unit level
4. Frontline staff engagement
5. Organizational learning
6. Support, resources and accountability
7. Feedback and Reinforcement
Evaluate Improvement

- **Process**
  - Device utilization
  - Summary of appropriate indications
  - Direct observation

- **Outcome**
  - CAUTI Rate
  - Standardized Infection Ratio
  - Number of days between events
Evaluation  Rate of CAUTI  Surgical Unit  2010 -2011

Rate per 1,000 catheter days

Education
Protocols  QI project
Surgical Pathways
Help all care givers understand their role in patient care

Safety through optimizing their practices

Days without a CAUTI

Story Telling
Summary

• Both nurses and physicians should evaluate the indications for urinary catheter utilization and assure that the organization has policies in place that are consistent with evidence based guidelines.

• Standard order sets and protocols can assist in assuring implementation of best practices.

• Partner with different disciplines (e.g., case management, nursing, infection prevention) to successfully achieve your goals.
Best Practices

Provide Resources:

- Turn Teams
- Incorporate into nurse rounding
- Available supplies for alternatives
  i.e. female urinal, condom cath
**Tools**

- Require appropriate indications for catheter placement
- Require physician order for placement
- Bladder scanners to evaluate/confirm urinary retention

**Catheter Orders with Decision Support:**

- Embed reminders for appropriate indications
- Embed reminders about alternatives to indwelling catheter use
- Start clock (24-48 h) for catheter removal reminders or stop orders
Once the Project is Over; Are we Finished?

It is very important that processes be hardwired

Find the right people for the team

Assure that you use available resources
Don’t Let This Happen!

OLD HABITS RECUR
Holding the Gains: Achieving Sustainability

The new process is:

• Integrated into daily workflow. It is institutionalized.
• Aligned with local culture.
• Effective and easy.
• Nurtured by periodic measurement and maintenance under the direction of a champion.
On Delirium, Sitters, Quality Leaders, and (Un)Sustainability
On Delirium, Sitters, Quality Leaders, and (Un)Sustainability

CAUTI
VTE
FALLS

MED REC
HANDOFF
Hygiene

Quality Team
How do we integrate it into the work flow?

Suggestions from coaching calls:

• Safety rounds
• Safety check list
• How can I keep this patient safe?
• Nurse driven protocols
• Starts in the ED
The Danger of Success

Taking your eye off “the ball”

We are at 100% compliance and no CAUTIs

Let’s look at something else

How do we prevent complacency?
What’s Next? Spreading Success

• After celebrating success at the local level, it’s time to share it with other units
• Where to start?
What Facilitates Spread Success?

- Evidence based efforts, tools and examples
- Pertinent and relevant issue
- Able to be piloted on a small scale
- Measurable and observable
- Leadership support
- Easy to adopt
Strategies for Spread

• Identify “fertile” units for spread
  – Sister units that share staff and population
  – Units with established safety culture and drive

• Identify high yield units
  – Rampant insertion in ED?
  – High prevalence or high CAUTI units

• Fertilize new units!

• Working with administration
Summary

- Both nurses and physicians should evaluate the indications for urinary catheter utilization and assure that the organization has policies in place that are consistent with evidence based guidelines.

- Standard order sets and protocols can assist in assuring implementation of best practices.

- Partner with different disciplines (e.g., case management, nursing, infection prevention) to successfully achieve your goals.
“The names of the patients whose lives we save can never be known. Our contribution will be what did not happen to them.

And, though they are unknown, we will know that mothers and fathers are at graduations and weddings they would have missed, grandchildren will know grandparents they might never have known, holidays will be taken, work completed, books read, symphonies heard, and gardens tended that, without our work, would never have been.”

*Donald M. Berwick, MD, MPP*