

Supplementary Online Content

Mody L, Greene MT, Meddings J, et al. A national implementation project to prevent catheter-associated urinary tract infection in nursing home residents. *JAMA Intern Med*. Published online May 19, 2017. doi:10.1001/jamainternmed.2017.1689

eFigure 1. Catheter-Associated Urinary Tract Infection (UTI) Bundle Infographic

eFigure 2. Project Timeline for Cohorts 1-4

eAppendix 1. List of Educational Presentation Topics

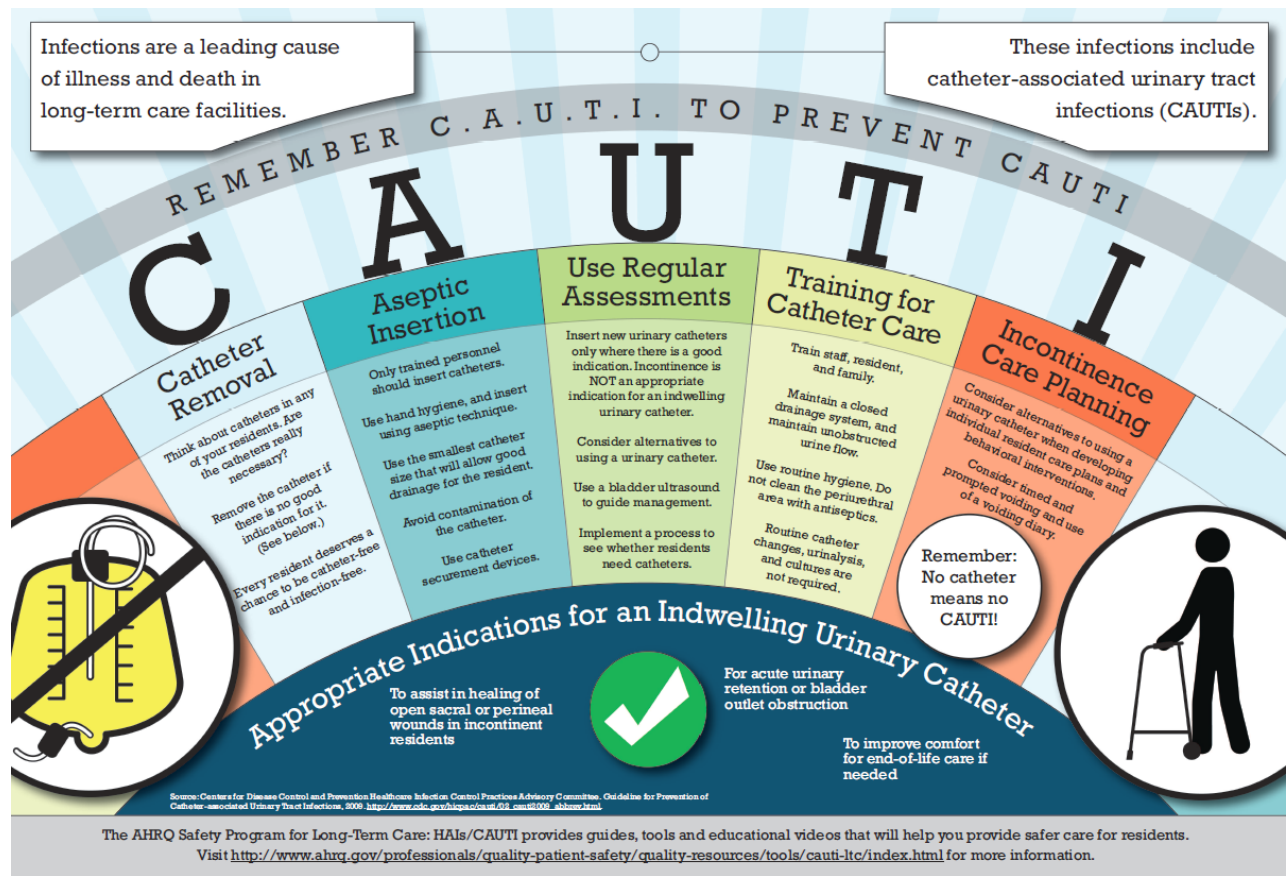
eAppendix 2. Tools From the AHRQ Safety Program for Long-term Care: HAIs/CAUTI

eTable 1. Catheter-Associated UTI Rates and Catheter Utilization by Project Month

eTable 2. Multivariable-Regression Estimates of Changes in Catheter Use Rates

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

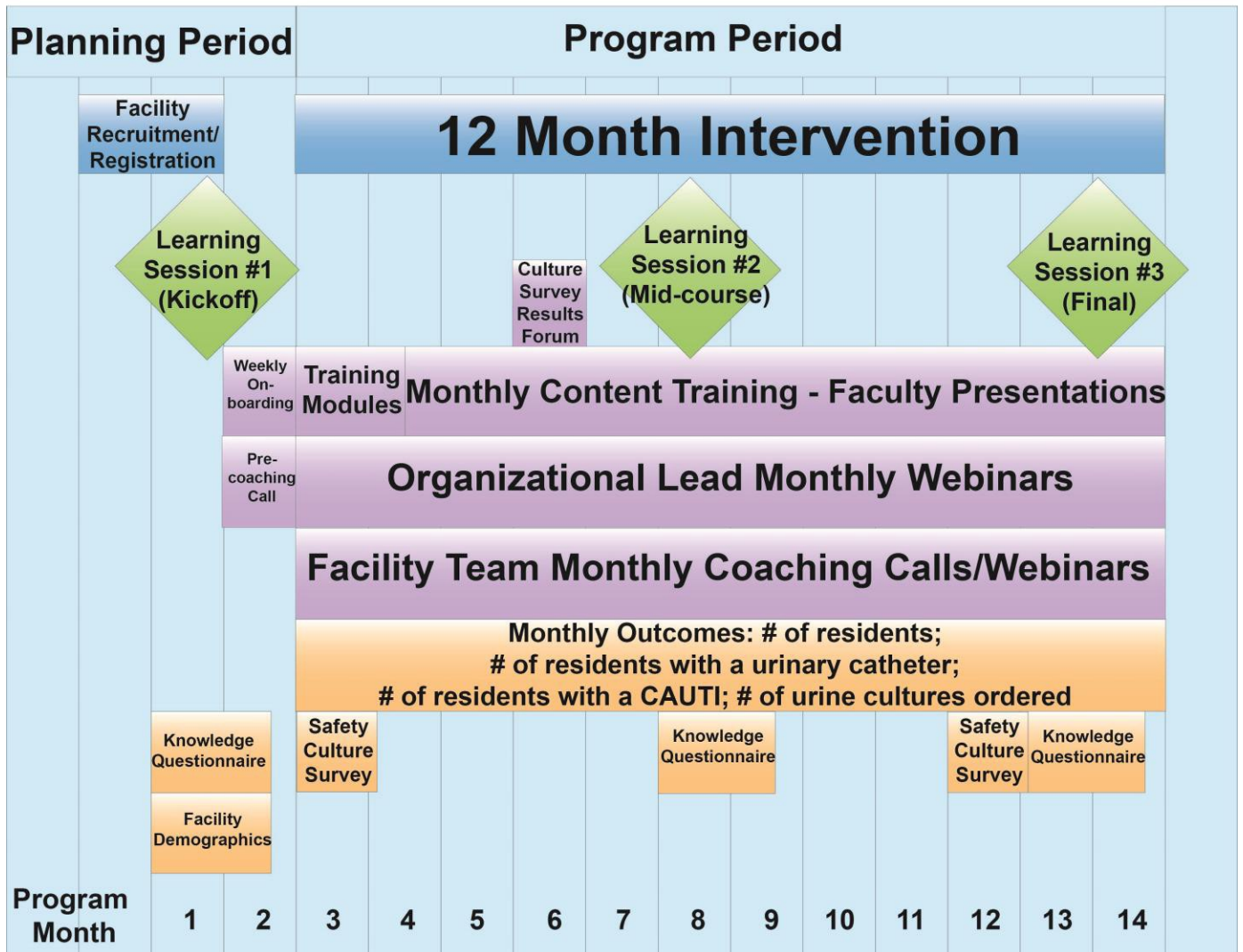
eFigure 1. Catheter-Associated Urinary Tract Infection (UTI) Bundle Infographic. AHRQ indicates Agency for Healthcare Research and Quality; HAIs, healthcare-associated infections.



The AHRQ Safety Program for Long-Term Care: HAIs/CAUTI

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eFigure 2. Project Timeline for Cohorts 1–4



Monthly Outcomes Data collection start: Cohort 1-May 2014; Cohort 2- November 2014; Cohort 3- June 2015; Cohort 4: September 2015. Cohort 4 had compressed data collection schedule of 10 months.

eAppendix 1. List of Educational Presentation Topics

1. Onboarding Modules
 - i. Building Your Team to Enhance Resident Safety
 - ii. Catheter-Associated Urinary Tract Infection (CAUTI) Definitions and Reporting
 - iii. Data Collection, Submission, and the AHRQ Nursing Home Survey on Patient Safety Culture
 - iv. Infection Prevention: Surveillance Essentials in Preventing Healthcare-associated Infections
2. Training Modules
 - i. Exploring Hand Hygiene: Knowledge and Practice
 - ii. Clean Equipment & Environment: Knowledge and Practice
 - iii. Personal Protective Equipment and Standard and Transmission-based Precautions
 - iv. How to Avoid the Harms of Antibiotic Overuse
3. Monthly National Content Webinars
 - i. Urinary Catheter Types and How to Care for Them
 - ii. Training LTC Facility Staff on Catheter Insertion and Maintenance to Prevent CAUTIs
 - iii. Catheter Care and Maintenance
 - iv. Hydration Practices and Urinary Incontinence Care Planning
 - v. Antibiotic Stewardship
 - vi. The Culture of Culturing: The Importance of Knowing When to Order Urine Cultures
 - vii. Demystifying CAUTI: When to Culture and When to Treat
 - viii. Leave Well Enough Alone: Avoiding Unnecessary Urine Cultures
 - ix. The Importance of Assessment to Prevent Resident Harm
 - x. A Farewell to Harms: Turbocharged Walking Rounds
 - xi. Applying NHSN CAUTI Criteria to Case Studies
 - xii. NHSN CAUTI Case Studies: Focusing on Changes in Mental Status and Activities of Daily Living (ADLs)
 - xiii. Long-Term Care Safety Toolkit: Building a Culture of Safety
 - xiv. Communicating Changes in Resident Condition
 - xv. Engaging Residents & Families in HAIs/CAUTI Prevention
 - xvi. Resident and Family-Centered Services: Maximizing Your Team
 - xvii. Interpreting and Using Your Results from the Nursing Home Survey on Patient Safety Culture
 - xviii. Care Transitions and Handovers: How Hospital and LTC Staff Can Partner with Patients and Residents to Reduce CAUTI Together
 - xix. Identifying and Overcoming Barriers to Staff Engagement in the CAUTI LTC Program
 - xx. Overcoming Challenges to Reduce CAUTI and Improve Safety Culture
 - xxi. Communication Strategies to Promote Resident Safety
 - xxii. Viewing HAI Prevention through the Lens of Quality Assurance and Performance Improvement (QAPI)
 - xxiii. Using the CDC's National Healthcare Safety Network (NHSN) to Collect Data and Sustain Your Gains

eAppendix 2. Tools From the AHRQ Safety Program for Long-term Care: HAIs/CAUTI

The final versions of an extensive set of CAUTI prevention resources that were developed and applied in the AHRQ Safety Program for Long-term Care: HAIs/CAUTI project are available on the Agency for Healthcare Research & Quality (AHRQ) website (<http://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/index.html>).

How to Use This Toolkit

<https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/how-to-use.html>

The toolkit is organized into three main sections that your facility can use to implement an improvement project to reduce CAUTI and other HAIs. Each section contains guides, tools, slide sets and videos to support implementation. All materials are publicly available and downloadable online. Many can be modified to meet the local facility needs and criteria.

Toolkit Sections

Each section contains customizable resources that your facility can use to implement an improvement project to reduce CAUTI and other HAIs.

A. Implementation

<https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/implement.html>

B. Sustainability

<https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/sustainability.html>

C. Resources

<https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/cauti-ltc/resources.html>

1. A Unit Guide to Infection Prevention for Long-term Care Personnel ([PDF File](#)): This guide provides frontline and other staff with basic knowledge about LTC facility infection prevention guidelines

2. Tools are available in the following topic areas:

[Implement an Infection Prevention Quality Improvement Project](#)

[Improve Safety Culture](#)

[Engage Residents and Families](#)

[Practice General Infection Prevention Skills](#)

[Prevent Catheter-Associated Urinary Tract Infection](#)

[Catheter-Associated Urinary Tract Infection Surveillance](#)

[Reduce Unnecessary Urine Culturing and the Overuse of Antibiotics](#)

eTable 1. Catheter-Associated UTI Rates and Catheter Utilization by Project Month

Study Month	Nursing Home (no.) ^a	CAUTI ^b (no.)	Resident-days	Catheter-days	CAUTI rate ^c	Catheter utilization
3	361	333	1088405	49140	6.777	4.5%
4	368	366	1133680	52062	7.030	4.6%
5	376	302	1193286	54227	5.569	4.5%
6	374	300	1111043	52660	5.697	4.7%
7	366	286	1141294	53839	5.312	4.7%
8	361	211	1117165	50618	4.168	4.5%
9	358	223	1103247	49285	4.525	4.5%
10	349	216	1097094	50137	4.308	4.6%
11	337	199	1051891	47862	4.158	4.6%
12	333	186	1018566	47618	3.906	4.7%
13	216	104	624526	30538	3.406	4.9%
14	193	70	546357	26610	2.631	4.9%

CAUTI = catheter-associated urinary tract infection.

^a404 nursing homes included in this analysis.

^bCAUTI was defined using the Centers for Disease Control and Prevention's National Healthcare Safety Network definition for long-term care.

^cCAUTI rate = number of CAUTI per 1,000 indwelling urinary catheter-days.

eTable 2. Multivariable-Regression Estimates of Changes in Catheter Use Rates

Characteristic	Incidence Rate Ratio (95% CI)^a	P value
Time ^b	0.95 (0.88-1.03)	0.26
Ownership		
For-profit	Reference	0.05
Not-for-profit	1.18 (1.00-1.38)	
Part of a chain	0.92 (0.79-1.06)	0.26
Bed size ^c	0.99 (0.98-1.00)	0.15
Provides sub-acute care	1.40 (1.03-1.91)	0.03
Overall 5 Star Rating	0.95 (0.89-1.01)	0.11
Infection preventionist has 3 or more years of experience	0.85 (0.72-0.99)	0.04
Presence of committee to review HAIs, including CAUTI	1.04 (0.87-1.25)	0.65

^a36 nursing homes missing one or more demographic characteristics were excluded from the analysis

^bTime was defined as the number of days from the end of the first reporting month to the end of the twelfth and final reporting month (335 days). Thus, the time variable was divided by 335 to give an incidence rate ratio representing change over the course of the project.

^cBed size was calculated as the total number of beds divided by 10 so that the incidence rate ratio represents a 10 bed increase to make the respective incidence rate ratio and 95% CI more interpretable.