Using Data to Drive Antimicrobial Stewardship Program in Nursing Homes through Existing Quality Assurance and Performance Improvement Processes

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Objectives

- Evaluate antimicrobial stewardship performance using regulatory, prescribing, and infection surveillance data.
- Use Quality Assurance and Performance Improvement (QAPI) tools to investigate drivers of antimicrobial overuse and optimize prescribing practices.
- Design data-driven stewardship initiatives aligned with CMS Requirements of Participation and facility quality goals.
- Demonstrate approaches for sustaining antimicrobial stewardship improvements through ongoing measurement and feedback.


How do we think about the big beast that is stewardship?

The 5 Ds of Antimicrobial Stewardship

Using antibiotics wisely helps improve patient outcomes, reduce side effects, and prevent antibiotic resistance. The 5 Ds of Antimicrobial Stewardship provide a simple framework to guide appropriate antibiotic use in everyday practice. Keep these key principles in mind to ensure the right treatment for the right patient at the right time.

Diagnosis	Does the resident truly have an infection that requires antimicrobial therapy?
Drug	Is the most likely causative organism of this infection typically susceptible to this drug?
Dose	What is the recommended dose for this type of infection, and does it need to be adjusted for renal function?
Duration	What is the recommended duration of treatment?
De-escalation	Can a narrower antibiotic be used once culture results are available?

Antimicrobial Resistance Threat

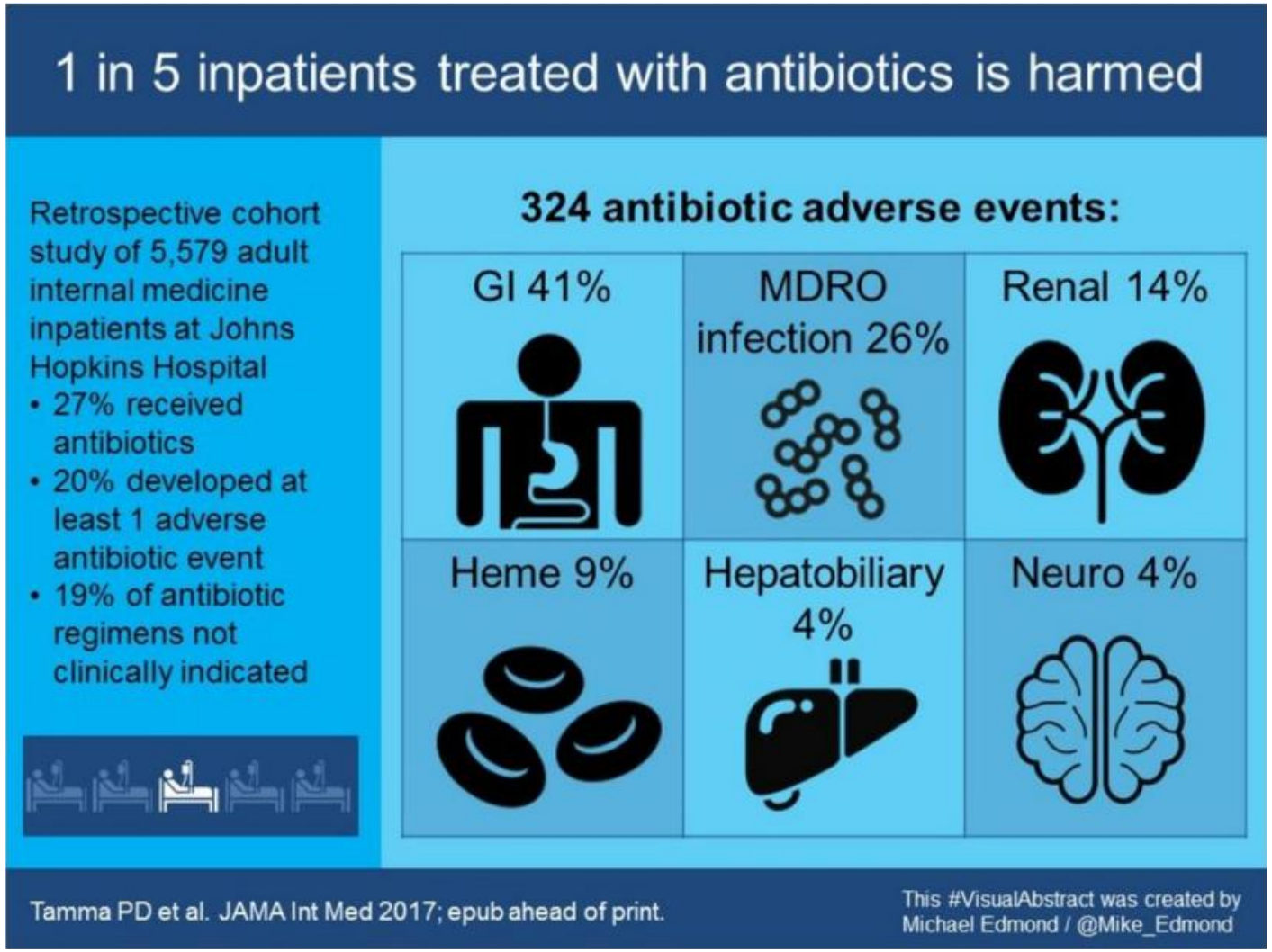
	Threat	Change in Rates or Number of Infections***			
		2020 vs. 2019	2021 vs. 2020	2022 vs. 2021	2022 vs. 2019
URGENT*	Hospital-onset CRE	▲ Increase	▲ Increase	— Stable	▲ Increase
URGENT*	Hospital-onset Carbapenem-resistant *Acinetobacter*	— Stable	— Stable	— Stable	▲ Increase**
URGENT*	Clinical Cases of *C. auris*	▲ Increase	▲ Increase	▲ Increase	▲ Increase
SERIOUS*	Hospital-onset MRSA	▲ Increase	— Stable	▼ Decrease	— Stable
SERIOUS*	Hospital-onset VRE	▲ Increase	▲ Increase	— Stable	▲ Increase
SERIOUS*	Hospital-onset ESBL-producing Enterobacterales	▲ Increase	— Stable	— Stable	▲ Increase
SERIOUS*	Hospital-onset MDR *Pseudomonas aeruginosa*	▲ Increase	▲ Increase	— Stable	▲ Increase

* Threat level for each pathogen, as categorized in CDC's Antibiotic Resistance Threats in the United States, 2019.

** There was no statistically significant difference in rate of hospital-onset carbapenem-resistant *Acinetobacter* in 2020, 2021, and 2022 when compared to the previous year. However

https://www.cdc.gov/antimicrobial-resistance/data-research/threats/update-2022.html

Additional Harm



Tamma PD, Avdic E, Li DX, Dzintars K, Cosgrove SE. Association of adverse events with antibiotic use in hospitalized patients. JAMA internal medicine. 2017 Sep 1;177(9):1308-15.

Stewardship can feel insurmountable

Stewardship: More than Antibiotics

Diagnostic stewardship	Do I need this test? What will I do with the results?
Device stewardship	Should patient have device in place? How long, if necessary?
Antimicrobial stewardship	Best drug, dose, duration

Morgan DJ et al. JAMA Internal Medicine. 2023;183(9):942-943.

Diagnostic Stewardship

- **Why are you getting the test?**
- What do you expect to do with the results?

Component	UA Inflammation	UA Metabolic	UA Renal	Complete UA (For Reference Only)
Gross evaluation		Color, odor, clarity	Color, odor, clarity	Color, odor, clarity
Chemical analysis	Leukocyte esterase	pH, albumin, specific gravity, glucose, bilirubin, ketones	pH, heme, albumin, specific gravity, glucose, bilirubin	pH, heme, leukocyte esterase, nitrite, albumin, specific gravity, glucose, bilirubin, ketones
Microscopic	White blood cells		White and red blood cells, casts, crystals	White and red blood cells, bacteria, yeast, epithelial cells, casts, crystals

Advani S et al. Antimicrobial Stewardship and Healthcare Epidemiology. 2021; 1(1): e6.

Do you think healthcare is safe?

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

The Safety of Inpatient Health Care

From the Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital (D.W.B., D.M.L., H.S., A.S., S.L., C.I., M.L.F., S.D., M.G.A., H.H.E., L.S.), the Department of Health Care Policy (E.M.), Harvard Medical School (D.W.B., D.M.L., H.S., A.S., D.M.S., S.L., J.P.Z., M.S.L., H.H.E., L.S., E.M.), the Department of Health Policy and Management, Harvard T.H. Chan School of Public Health (D.W.B.), the Edward P. Lawrence Center for Quality and Safety (D.M.S., J.P.Z., E.M.), epartment tment of Ne- on of Mas- d the y and of the , P.F., Kaiser vision of Research, Oakland (L.C.M.), Maine Medical Center, Portland (C.G.R.); and Mass General Brigham, Somerville, MA (L.A.V.). Dr. Bates can be contacted at dbates@bwh.harvard.edu or at the Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital, 1620 Tremont St., Boston, MA 02120.

N Engl J Med 2023;388:142-53.
DOI: 10.1056/NEJMsa2206117

ABSTRACT

BACKGROUND

Adverse events during hospitalization are a major cause of patient harm, as documented in the 1991 Harvard Medical Practice Study. Patient safety has changed substantially in the decades since that study was conducted, and a more current assessment of harm during hospitalization is warranted.

METHODS

We conducted a retrospective cohort study to assess the frequency, preventability, and severity of patient harm in a random sample of admissions from 11 Massachusetts hospitals during the 2018 calendar year. The occurrence of adverse events was assessed with the use of a trigger method (identification of information in a medical record that was previously shown to be associated with adverse events) and from review of medical records. Trained nurses reviewed records and identified admissions with possible adverse events that were then adjudicated by physicians, who confirmed the presence and characteristics of the adverse events.

RESULTS

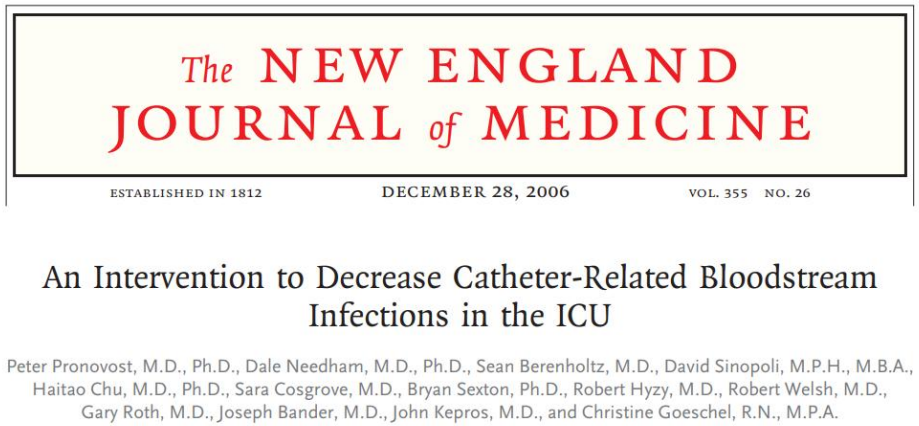
In a random sample of 2809 admissions, we identified at least one adverse event in 23.6%. Among 978 adverse events, 222 (22.7%) were judged to be preventable and 316 (32.3%) had a severity level of serious (i.e., caused harm that resulted in substantial intervention or prolonged recovery) or higher. A preventable adverse event occurred in 191 (6.8%) of all admissions, and a preventable adverse event with a severity level of serious or higher occurred in 29 (1.0%). There were seven deaths, one of which was deemed to be preventable. Adverse drug events were the most common adverse events (accounting for 39.0% of all events), followed by surgical or other procedural events (30.4%), patient-care events (which were defined as events associated with nursing care, including falls and pressure ulcers) (15.0%), and health care–associated infections (11.9%).

CONCLUSIONS

Adverse events were identified in nearly one in four admissions, and approximately one fourth of the events were preventable. These findings underscore the importance of patient safety and the need for continuing improvement. (Funded by the Controlled Risk Insurance Company and the Risk Management Foundation of the Harvard Medical Institutions.)

- In a 24h observational study in the ICU, the average patient required 178 individual actions.
- Errors occurred only 1% of these actions—that's still 2 things going wrong every day
- Dr. Peter Provonost developed a 5 step checklist to hold doctors/nurses accountable for CVC insertion practices
- Infection rates decreased…to zero.

Quality Assurance and Performance Improvement (QAPI)



From 2006 to 2026…

Quality Assurance and Performance Improvement (QAPI)

Design and Scope

Defines structure and reach of program

Ensures tailored to facility

Promotes continuous cycle of improvement

Governance and Leadership

Requires facility leadership to be engaged and accountable for QAPI implementation, providing the necessary resources, training, and unified vision for program

Feedback, Data Systems, and Monitoring

Focuses on gathering actionable information (clinical indicators, adverse events, stakeholder feedback)

Identify trends, track outcomes, pinpoint areas needing attention

Performance Improvement Projects

Team-based

Focused efforts

Address specific problems or processes

Achieve measurable improvement

Sustain these gains over time

Systematic Analysis and Systemic Action

Encourages analysis for 'why'

Implement system-wide changes to prevent the problem from recurring, rather than relying on temporary fixes

qapifiveelements.pdf

Evaluation of Stewardship

- Multiple options:
  - CMS Nursing Home Care Compare/Provider Data Catalog
    - Quality measures, hospital/rehospitalization rates, infection-related quality indicators, survey deficiencies (citations)
  - Antibiotic Prescribing Data/EHR
    - Pharmacy dispensing reports: antibiotic starts, days of therapy (DOT), antibiotic classes prescribed, duration of therapy, "high risk" antimicrobial use
    - EHR: indications for antimicrobial use, prescriber-specific prescribing patterns, documentation of antimicrobial time-outs and reviews
    - Consultant pharmacist medication reviews: quarterly medication regimen reviews, identification of unnecessary antimicrobial use

More Evaluation of Stewardship

- Infection Surveillance Data
  - NHSN: UTI events, respiratory events, MDRO surveillance, AU/AR data (if available), facility-level benchmarking opportunities
  - Facility infection log/line lists: McGeer/NHSN defined events, infection rates per 1000 resident days, trends by unit/season/organism
  - Microbiology reports/antibiograms: organism prevalence, antibiotic susceptibility patterns, emerging resistance trends
- Resident Outcomes Data
  - *C. difficile* infection rates, infection-related hospital transfers, sepsis hospitalizations, adverse drug events associated with antimicrobials, MDRO acquisition/transmission rates

CMS requirements

F881 ASP

F880 IPC

https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/qapiresources

Strategies

Throughout this change package, each strategy will be supported by change concepts and action items. Change concepts are general approaches that are intended to stimulate creative and critical thinking and are further grounded by specific actionable items that any nursing home can begin testing for purposes of improving residents' quality of life and care. Together, strategies, change concepts, and action items are designed to lead to improvement.

1. **Lead with a sense of purpose:** The actions of leaders, multiplied by the actions of many, shape a culture and an organization. Strategy 1 sets the expectation for excellence in leadership. The foundation of a learning organization rests upon exceptional executive leadership, a strong mission and values, and an accepting, non-punitive culture.
2. **Recruit and retain quality staff:** A quality-driven nursing home identifies and develops great talent, in whatever discipline they serve, by setting high expectations and fostering an affirming culture. It recruits and hires qualified caring staff that fits its mission, values, and culture, and then cultivates longevity through a supportive work environment. Staff members at every level feel that their primary purpose is to provide quality care to the residents.
3. **Connect with residents in a celebration of their lives:** Distinctive nursing homes create an environment where the "resident always comes first." The focus is on keeping residents active in their familie and the community, according to resident preferences. At the end of life, a celebration of life honors the res and embraces family, other residents, and staff. References to family in this change package include any or a individuals identified by the resident or important to the resident's quality of life.
4. **Nourish teamwork and communication:** Teamwork and communication among staff and betv staff and residents is nourished by disseminating information in a complete, consistent, and timely manner. communication links people and builds relationships between staff and residents. High-functioning teams one another and work interdependently towards common goals.
5. **Be a continuous learning organization:** A continuous learning organization knows where it stands, knows when and how to change, uses data to drive performance, and views the organization as an interdependent system. The interdependent system is described as the combination of the people, structur supplies, and resources that come together within an organization to make it function.
6. **Provide exceptional compassionate clinical care that treats the whole person:** A on the whole person requires staff that knows the residents well and can anticipate their needs. It also requi engaged and competent medical and care team that effectively manages residents' changing health condit and avoids Healthcare-Acquired Conditions (HACs).
7. **Construct solid business practices that support your purpose:** A well-run nursing hom excels as a business, yet feels like home. It seeks ways to effectively manage the bottom line with integrity a with the resident as the focus. It runs efficient operations, invests in equipment and supplies to provide the highest quality care, and ensures that its physical and outdoor environments are comfortable and inviting.

National Nursing Home Quality Care Collaborative

Root Cause Analysis - VHA National Center for Patient Safety

WHAT IS QAPI?

QAPI is the merger of two complementary approaches to quality management, Quality Assurance (QA) and Performance Improvement (PI). Both involve using information, but differ in key ways:

- QA is a process of meeting quality standards and assuring that care reaches an acceptable level. Nursing homes typically set QA thresholds to comply with regulations. They may also create standards that go beyond regulations. QA is a reactive, retrospective effort to examine why a facility failed to meet certain standards. QA activities do improve quality, but efforts frequently end once the standard is met.
- PI (also called Quality Improvement - QI) is a pro-active and continuous study of processes with the intent to prevent or decrease the likelihood of problems by identifying areas of opportunity and testing new approaches to fix underlying causes of persistent/systemic problems. PI in nursing homes aims to improve processes involved in health care delivery and resident quality of life. PI can make good quality even better.

The chart below was adapted from the Health Resources and Services Administration (HRSA)[1] and shows some key differences between QA and PI efforts.

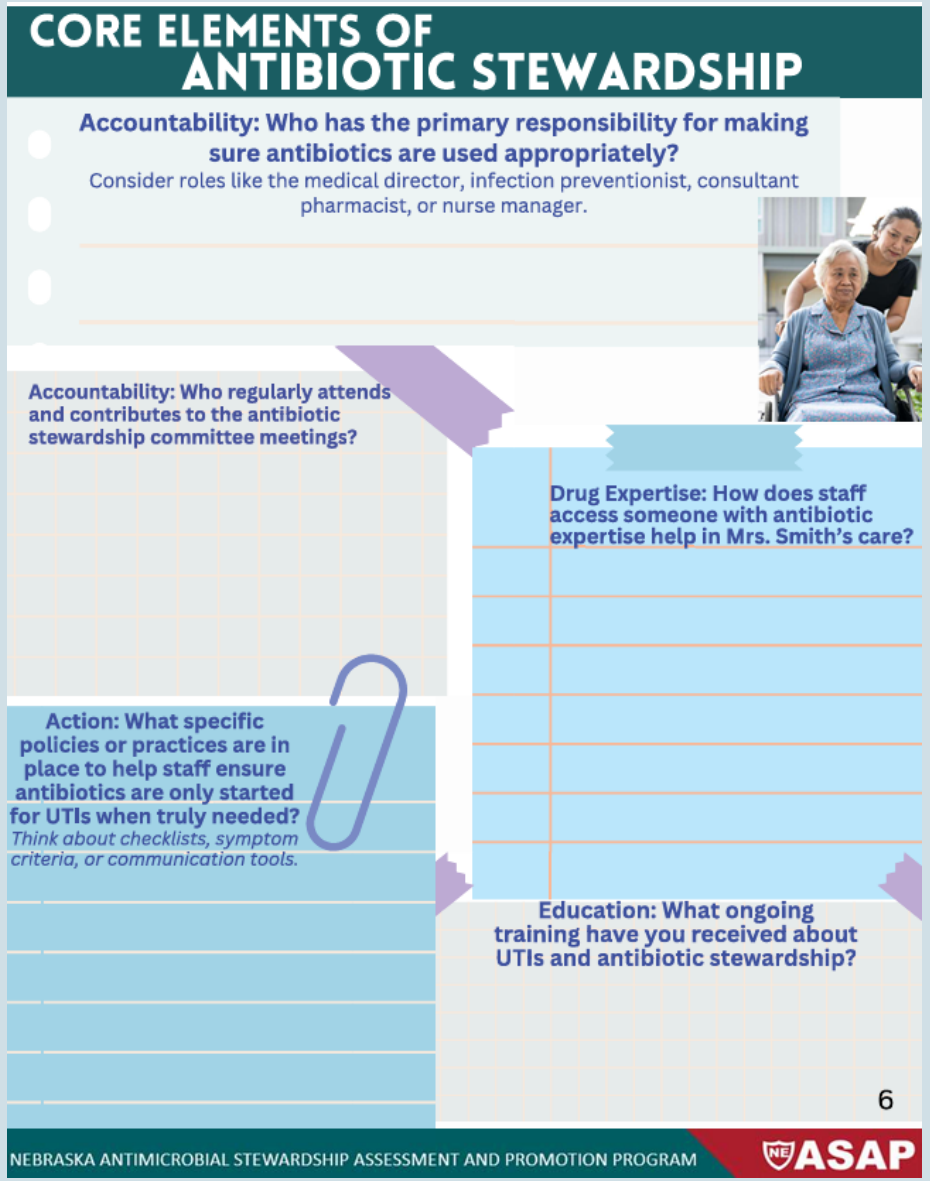
	QUALITY ASSURANCE	PERFORMANCE IMPROVEMENT
Motivation	Measuring compliance with standards	Continuously improving processes to meet standards
Means	Inspection	Prevention
Attitude	Required, reactive	Chosen, proactive
Focus	Outliers: *"bad apples"* Individuals	Processes or Systems
Scope	Medical provider	Resident care
Responsibility	Few	All

QA + PI = QAPI

QA and PI combine to form QAPI, a comprehensive approach to ensuring high quality care.

QAPI is a data-driven, proactive approach to improving the quality of life, care, and services in nursing homes. The activities of QAPI involve members at all levels of the organization to: identify opportunities for improvement; address gaps in systems or processes; develop and implement an improvement or corrective plan; and continuously monitor effectiveness of interventions.

QAPI At a Glance: A Step by Step Guide to Implementing Quality Assurance and Performance Improvement in Your Nursing Home



Long Term Care - ASAP

QAPI Framework: Examples

Are we prescribing appropriately?

- Antibiotic starts
- Days of therapy
- Fluoroquinolone use

process measures
(prescribing)

Are infections being prevented and managed effectively?

- UTI rates (CAUTI as well)
- Respiratory infection rates
- *C. difficile* rates
- MDRO trends

surveillance measures
(infection data)

Are outcomes improving?

- Hospital transfers
- Sepsis admissions
- Deficiency citations
- CMS quality measures

outcome measures
(resident outcomes)


“but…how do I start
doing this?”

New – Updated Tracking Tool

Nebraska ASAP Infection and Antibiotic Use Tracking Tool 2025 Version 2

Please note: The initial release of the Nebraska ASAP Infection and Antibiotic Use Tracking Tool, released in May 2025, is missing a formula that affects the tables and graphs. An updated file, Version 2 is now available. Please download the new version and paste your existing data into it. If you need assistance, please email Dan German (dgerman@nebraskamed.com). Click here for more information.

Nebraska ASAP Infection and Antibiotic Tracking Tool Instructions

Infection & Antibiotic Use Tracking Tool Video

Data Source	Potential Opportunity
Pharmacy reports	Fluoroquinolone use
	n UTI treatment es
	quent treatment SB
	sis or infection- ted readmission
	eat IPC deficiencies

How do I make busy people think this is important?

Facility Goal	Stewardship Goal
Reduce hospitalizations	Improve infection assessment before prescribing
Improve quality measures	Reduce unnecessary antibiotic use
Reduce *C. diff*	Minimize broad-spectrum antibiotic exposure
Improve survey readiness	Demonstrate active monitoring and QAPI oversight

Align stewardship goals with organization goals!

…Never let a crisis go to waste

Ok, but how do I actually do that?

Always have sustainability in mind!

- Data
- Identify gap
- CMS/QAPI alignment
- Intervention
- Measurement

Key QAPI Tools/Application

Root cause analysis

Process mapping

Five Whys Analysis

PDSA (Plan-Do-Study-Act)

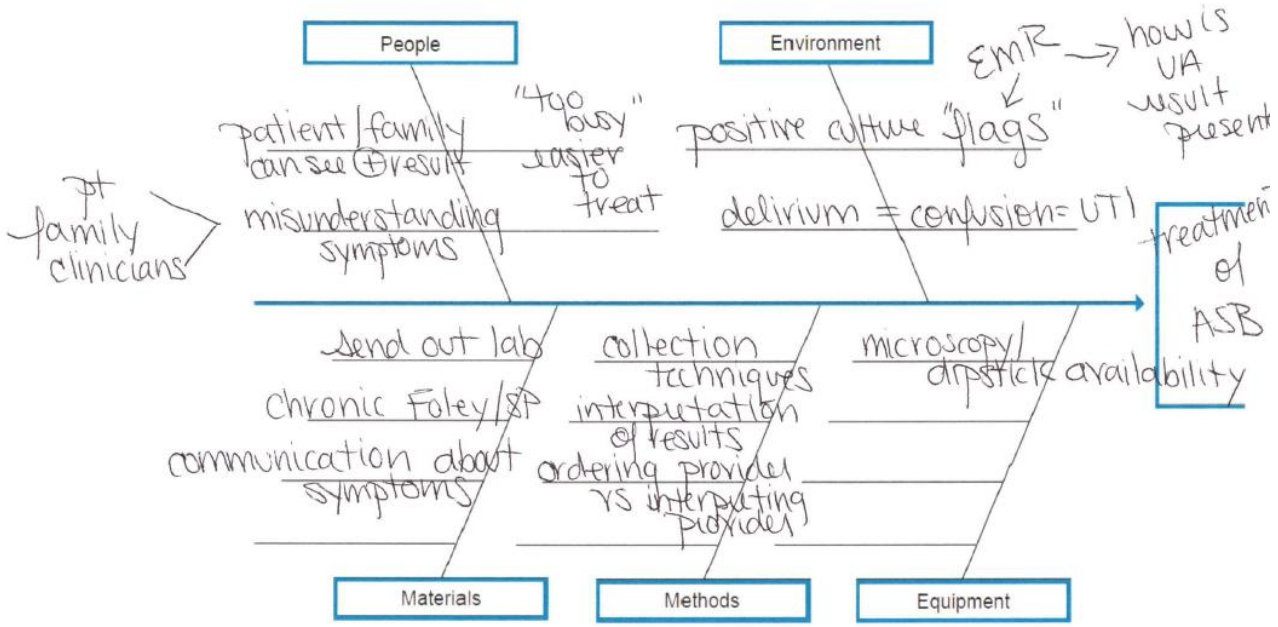
Run charts or control charts

Pareto Analysis

Home | Institute for Healthcare Improvement

Root Cause Analysis

- A structured method used to find the hidden system flaws behind a medical error or near miss instead of blaming a single person
- Fishbone or Ishikawa diagram is a visual problem solving tool
- Stewardship application example: Investigate why inappropriate prescribing occurs
  - Examples:
    - why are antibiotics being prescribed for asymptomatic bacteriuria (ASB)?
    - Why are urine cultures being ordered without symptoms?
    - Why are antibiotic durations exceeding facility guidelines?



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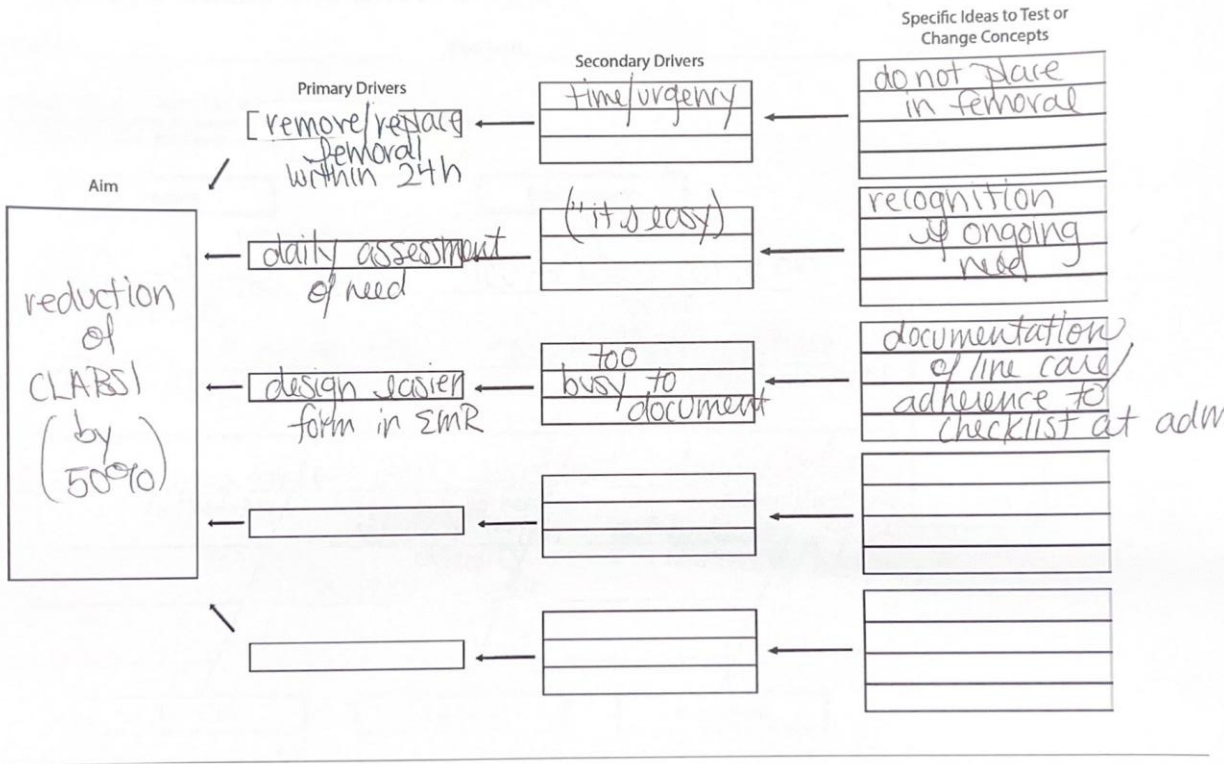
Template: Driver Diagram



Perform a SWOT analysis of this scenario to address how care of this patient could be improved.

Strengths:	Weaknesses:
Opportunities:	Threats:

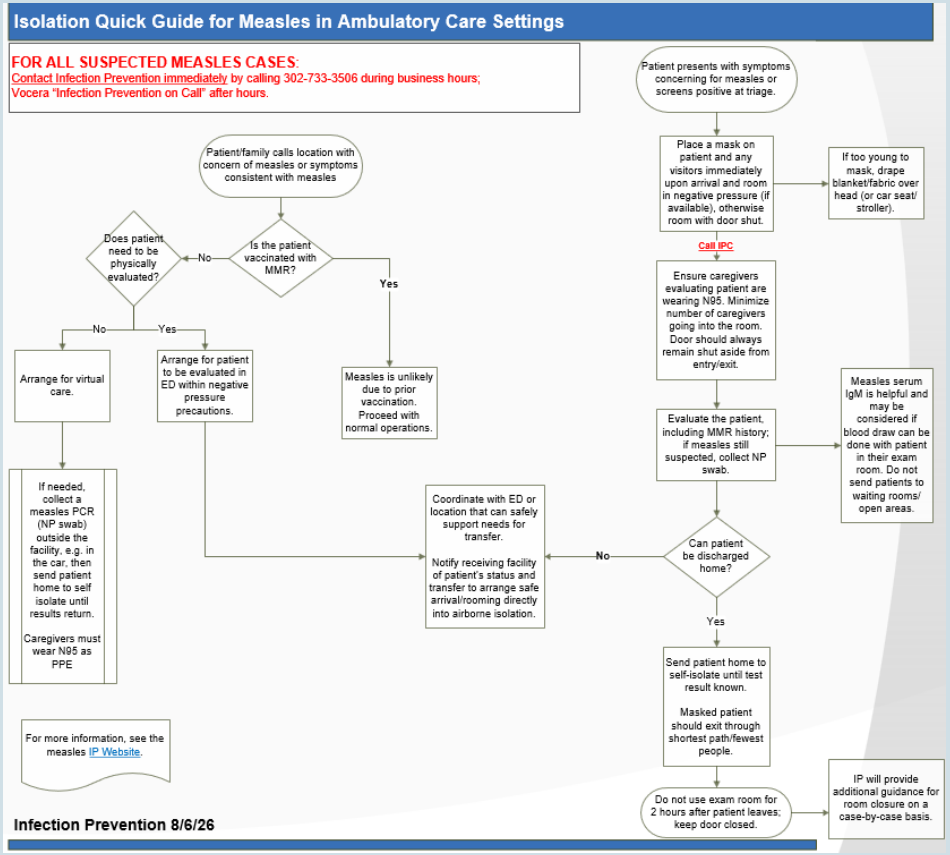
Process Mapping

- Map the workflow in a visualization/"roadmap":
  - From symptom identification→nursing assessment→provider communication→culture collection→antibiotic prescribing
  - Identify gaps, delays, and opportunities for standardization.

  - Recent work around "panculturing" behaviors, process mapping showed that communication around fevers needed to be improved, particularly at night/cross-covering. Created electronic paging template encouraging symptom discuss as well as offering a monitoring plan, instead of "asking" for orders.

Walk it out, step by step

Can be processes or communication strategies or…



Five Whys Analysis

- Drill down to underlying causes of recurrent stewardship issues
  - Example:
    - **Why** are there frequent UTI antibiotic starts?
      - Because urine cultures are frequently obtained.
        - **Why?**
          - Because nonspecific changes trigger testing.
            - **Why?**
              - Staff lack a standardized symptoms assessment process.

Suspected Urinary Tract Infection (UTI) in Long-Term Care Residents

Signs & Symptoms of a UTI

For Residents Without a Urinary Catheter

- ☐ Dysuria

OR

- ☐ Fever (>100°F or >2°F above baseline)

AND at least one of the following symptoms that is new or worsening:

- ☐ Urgency
- ☐ Frequency
- ☐ Suprapubic pain
- ☐ Gross hematuria
- ☐ Costovertebral angle tenderness
- ☐ Urinary incontinence

For Residents With a Urinary Catheter or if Nonverbal

One or more of the following ***without another recognized cause:***

- ☐ Fever (>100°F or a 2°F increase from baseline)
- ☐ New costovertebral angle tenderness
- ☐ Rigors
- ☐ New-onset delirium*

**If adequate workup for other causes of delirium has been performed and no other cause for delirium is identified*

- ☐ Send a urinalysis (UA) & urine culture (UCx)
- ☐ Increase hydration
- ☐ Start antibiotics before UA and UCx results, if resident appears ill
- ☐ If UA & UCx are positive and the resident has ongoing UTI symptoms, modify antibiotics or start antibiotics (if not receiving active antibiotics)

Do NOT Send a Urinalysis and Urine Culture:

- ☐ If the urine is foul smelling or cloudy, without other urinary symptoms
- ☐ Routinely after urethral catheter change
- ☐ Routinely upon admission
- ☐ After treatment to "document care" or "test of cure"
- ☐ For mental status changes (without vital sign changes or urinary symptoms for noncatheterized residents)

VA

Symptom-Free Pee: LET IT BE

A national initiative to stop inappropriate antibiotic use for asymptomatic bacteriuria in long-term care residents.

Asymptomatic bacteriuria (bacteria in the urine with no symptoms) is colonization of the bladder that occurs frequently in the elderly, especially those with diabetes, immobility, fecal incontinence, prostatic enlargement, or post-menopausal changes.

ANTIBIOTICS NOT INDICATED!
Asymptomatic bacteriuria is not an infection

➔ **Do not test urine even if foul-smelling, dark, or cloudy**

For hemodynamically stable residents with cognitive changes, seek other causes: drug interactions / side effects, dehydration, sleep disturbances, sensory deprivation, hypoxia, hypoglycemia, constipation, etc.

***Note:** Falls, decreased appetite, verbal aggression, wandering, confusion, and disorientation alone are not indications for urine testing.*

HOLD URINE TESTING;

➔ **Monitor frequently**

➔ **Rehydrate / push fluids for 24 hours if not contraindicated**

Possible urinary tract infection if at least **TWO** are present:

- ❑ Fever / rigors
- ❑ Flank pain / suprapubic pain
- ❑ Pain on urination
- ❑ New frequency
- ❑ Hematuria
- ❑ New incontinence

Dipsticks are not recommended due to poor predictive value.

Urine culture ideally should be submitted in preservative.

➔ **Send urine for urinalysis and urine culture**

IT IS HARD TO IGNORE A POSITIVE URINE TEST...

Unnecessary testing in **colonized residents** results in **unnecessary antibiotics**, which lead to **adverse events** (antibiotic resistance / failure, *C. difficile* infection, GI upset, etc.)

For more directions and guidance:
www.ammi.ca
#SymptomFreeLetItBe

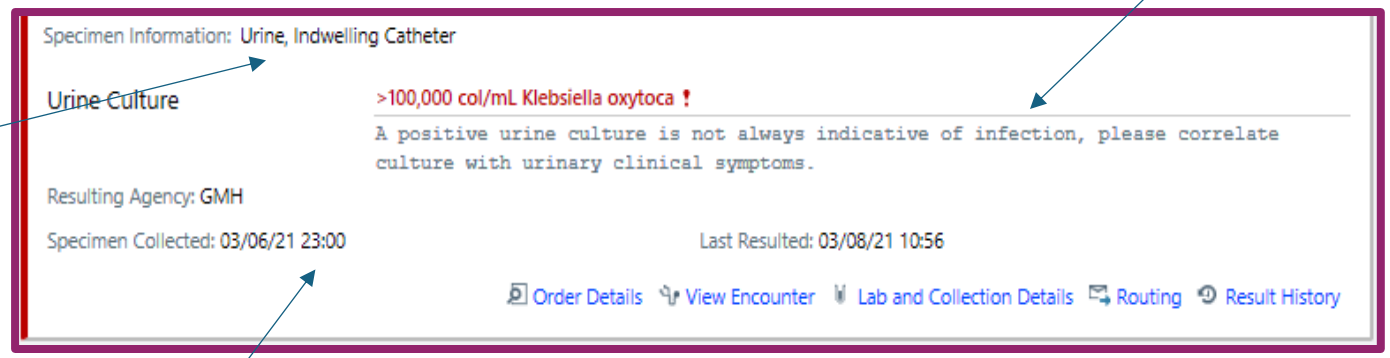
AMMI™ Canada

PDSA (Plan-Do-Study-Act)

- Test small stewardship interventions
  - Examples:
    - SBAR tool for provider communication
    - Antibiotic timeout at 48-72h
    - UTI assessment algorithm before urine culture collection

Stewardship initiative of "nudge" with microbiology comment, one cycle of continuous PDSA

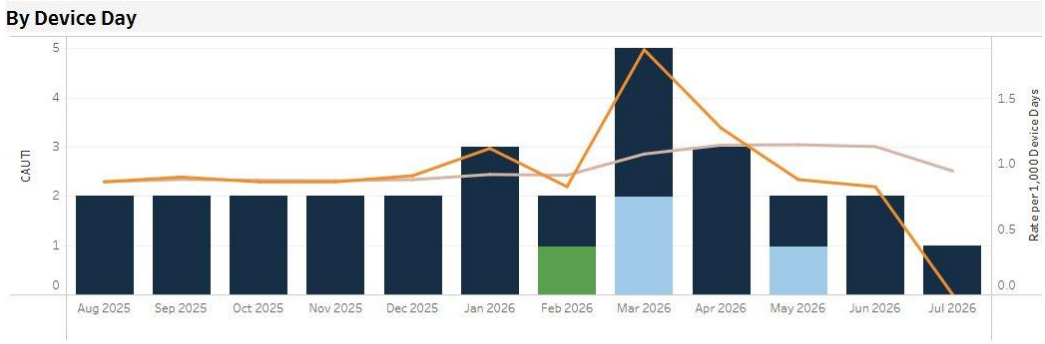
Opportunity around specimen collection



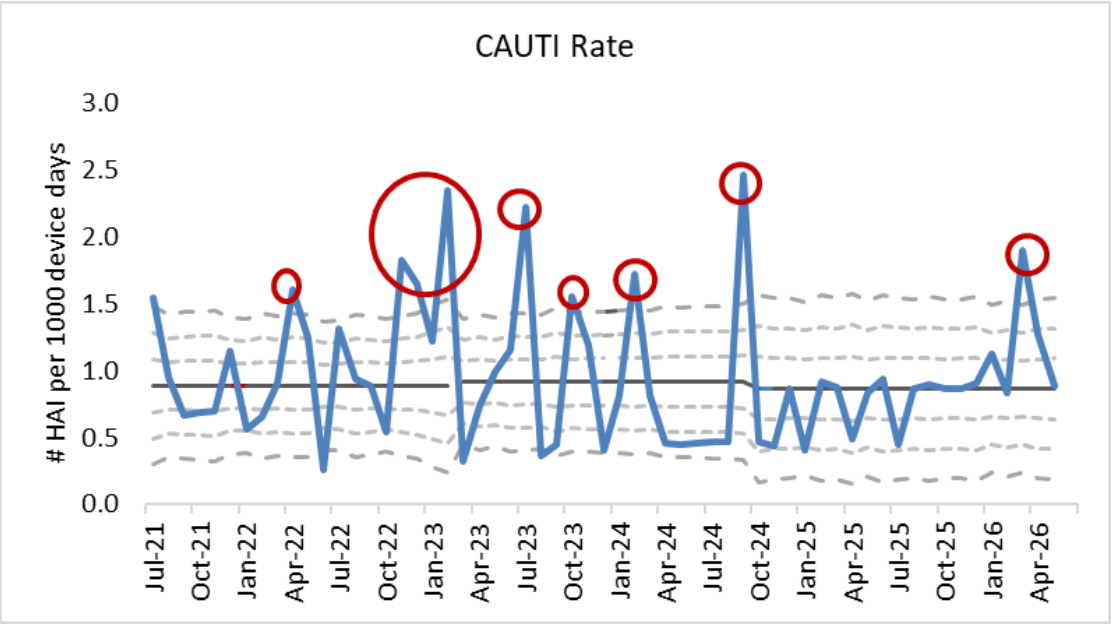
Opportunity around off-shift ordering

Run Charts and Control Charts

- Can monitor:
  - Antibiotic starts per 1000 resident-days
  - Fluoroquinolone use
  - UTI treatment rates
  - Average duration of therapy
- Determine whether changes result in sustained improvement

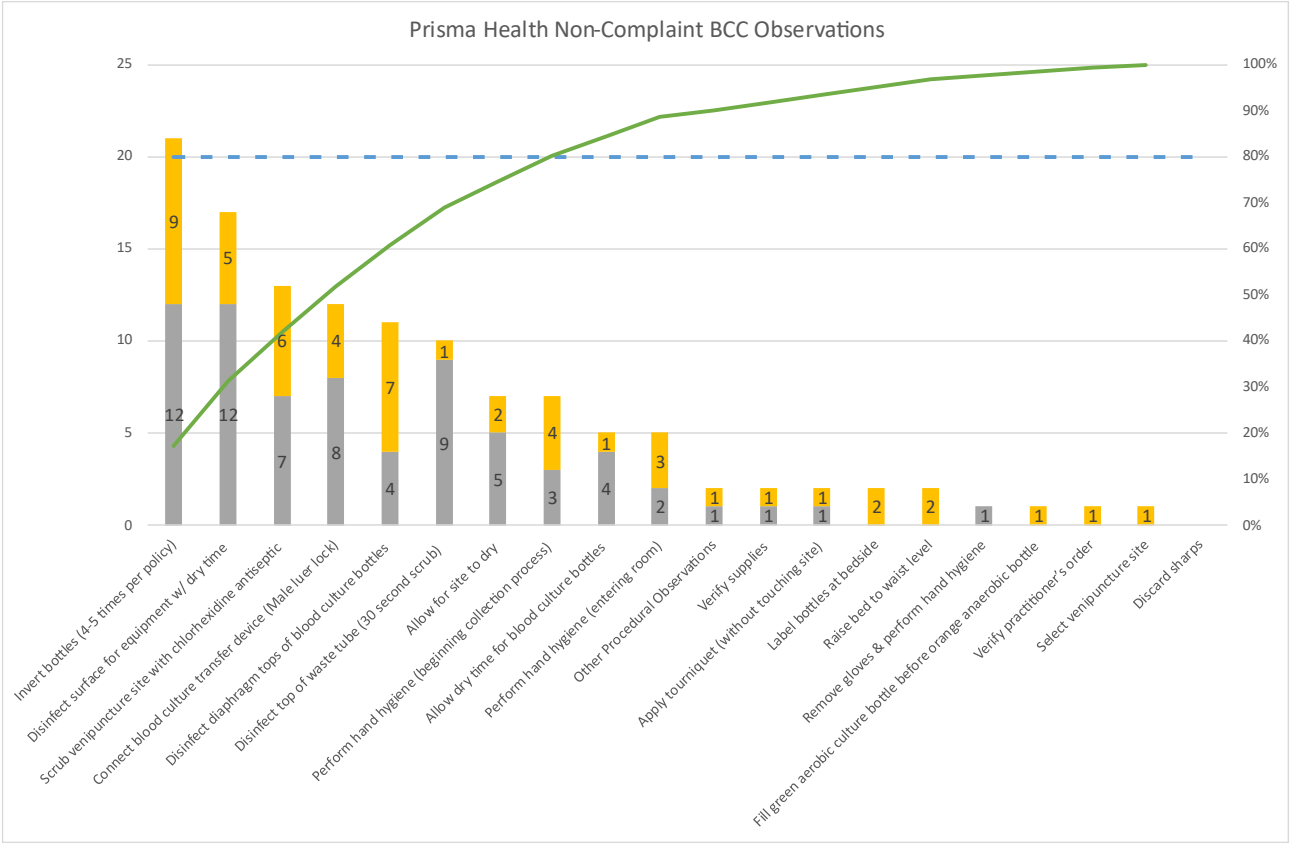


	Aug 2025	Sep 2025	Oct 2025	Nov 2025	Dec 2025	Jan 2026	Feb 2026	Mar 2026	Apr 2026	May 2026	Jun 2026	Jul 2026
CAUTI	2	2	2	2	2	3	2	5	3	2	2	1
CAUTI Rate	0.9	0.9	0.9	0.9	0.9	1.1	0.8	1.9	1.3	0.9	0.8	0.0
Device Days	2,315	2,221	2,316	2,315	2,195	2,678	2,420	2,662	2,352	2,270	2,422	0
Device Util	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.05	0.06	0.00
Patient Days	38,832	37,694	37,367	38,171	38,747	40,714	38,145	41,644	38,609	40,409	38,915	16,447



Pareto Analysis

- Identify the “vital few” drivers of antimicrobial use (AU)
- May identify:
  - 80% antibiotic starts are for UTIs
  - 60% prolonged curses stem from 3 prescribers
- Focus interventions where they will have the greatest impact



You've asked your "whys," now back to the "how"

Establish meaningful measures

Maybe something you already have access to?

- Start small
  - Process measures:
    - Antibiotic starts per 1000 resident days, UTI prescriptions, FQ use, % antibiotic prescriptions with documented indication, % of antibiotic timeouts completed, utilization of devices or device days, urinalyses/cultures sent with symptoms documented
  - Outcome measures:
    - *C. diff* infections, hospital transfers related to infection, sepsis admissions, MDRO rates
  - Balancing measures:
    - Hospitalizations for untreated infections, resident safety concerns, provider satisfaction

Generate regular feedback

- Share your data with people who can influence practice!
  - They may also be able to help you overcome barriers
- Share your projects, both successes and failures
  - Monthly
    - Infection Prevention Committee
    - QAPI committee
    - Medical Director
    - Director of Nursing
  - Quarterly
    - Prescriber-specific reports
    - P&T review
    - Governing body/leadership reports

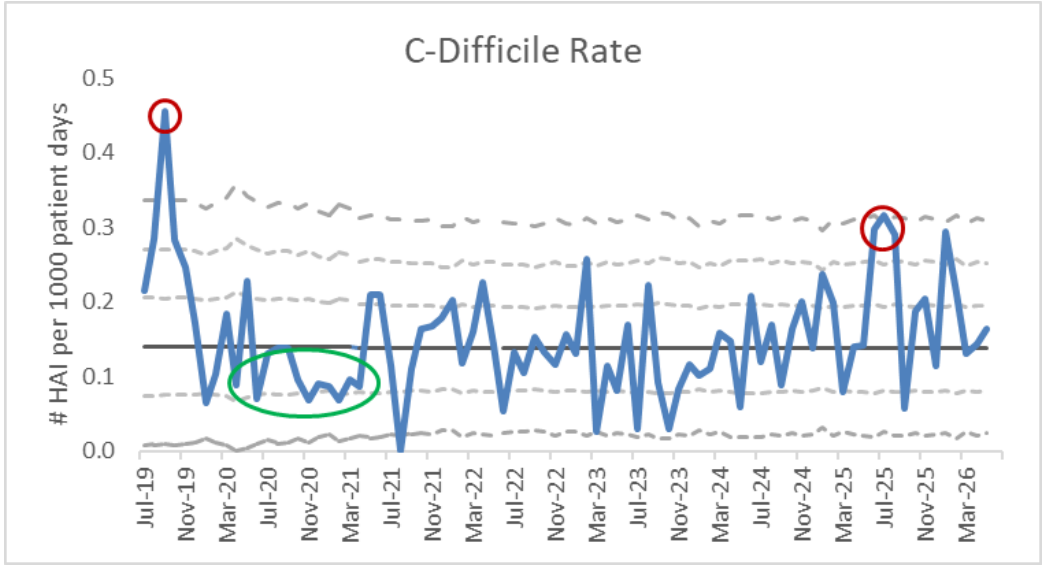
What to Share:
Antimicrobial use trends
UTI treatment rates
Top prescribing patterns
Success stories and improvement opportunities

Use Data Visualization

- Simple visuals are often very powerful (and more powerful than Excel or tables or Powerpoints)
  - Run charts
  - Control charts
  - Dashboads
  - Unit-specific trend reports

- Show:
  - Baseline performance
  - Intervention implementation
  - Sustained improvement over time

This could also be your Pareto Chart or Fishbone or…



Can you incorporate stewardship into existing QAPI processes?

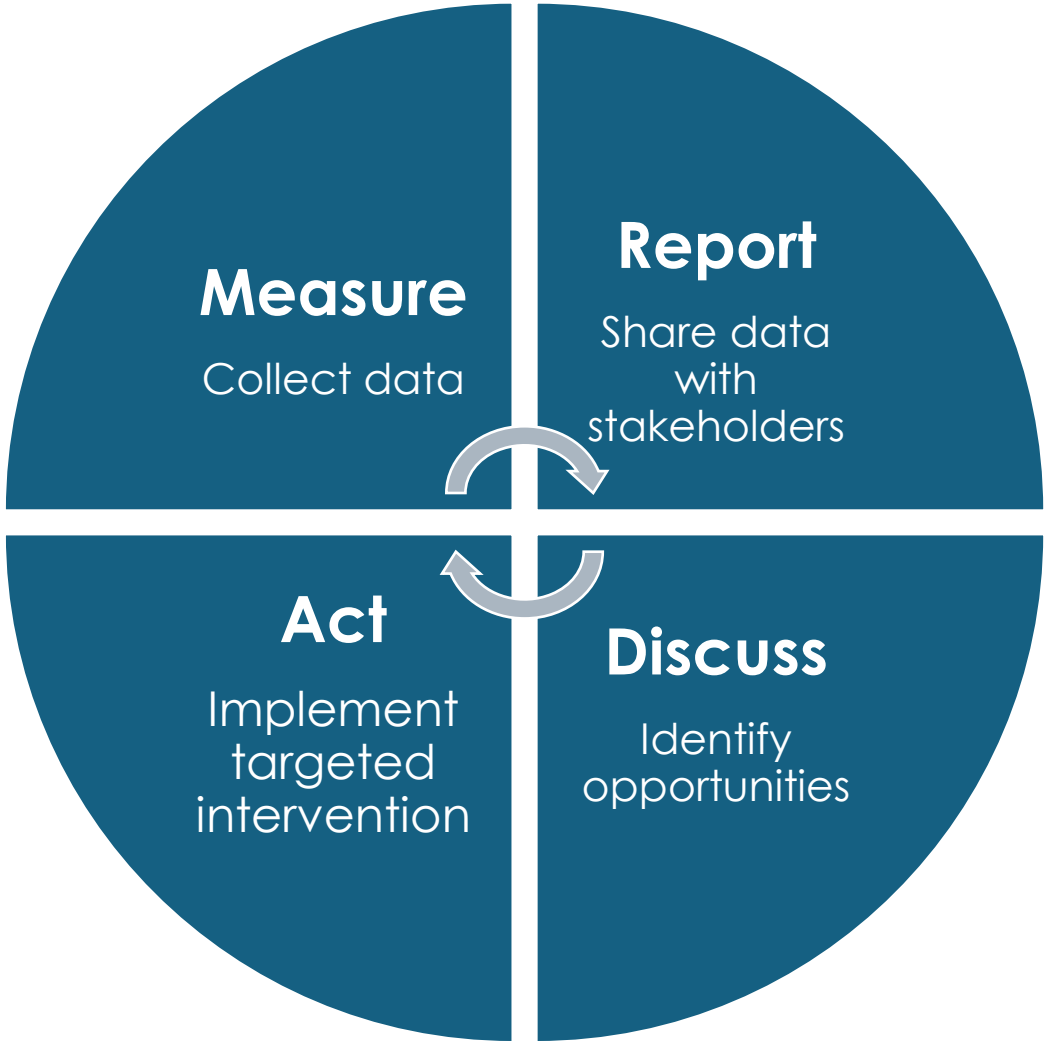
- Embed stewardship QAPI into:
  - IPC
    - ASP and IPC go hand in hand, leverage some of the resources there
  - QAPI reviews
  - Pharmacy consultant reviews
    - AU/AR, abx starts, FQ use…
  - Medical staff meetings
    - Process mapping, Pareto charts may point to behaviors or education that can be addressed at meeting/huddles
  - Leadership dashboards

This makes stewardship sustainable because it's part of routine operations!

Recognize and reinforce success

- Feedback will encourage continued engagement
  - Highlight reductions in unnecessary UTI treatment/ASB
  - Recognize units with improved prescribing practices
  - Share positive resident outcomes
  - Celebrate achievement of stewardship goals

Continuous process improvement



Counseling Points for Residents and Families:

- Antibiotic prophylaxis is not a lifelong treatment. The goal of a prolonged course of antibiotics is to allow time for the bladder wall to heal, making UTIs less likely. There is no evidence of additional benefit beyond 6-12 months. Therefore, antibiotic treatment should be stopped ideally after 6 months.
- Long-term antibiotic prophylaxis will cause antibiotic resistance and will limit future treatment options.

[Facility Logo] | Resident Label

S **Situation**
I am concerned about a suspected UTI for the above resident.

B **Background**
Indwelling catheter □Yes □No If yes, □ Urethral □ Suprapubic
Incontinence □Yes □No If yes, is this new or worsening □Yes □No
UTI in last 6 months □Yes □No If yes, Date: _____ Organism: _____ Treatment: _____
Active diagnosis (especially bladder, kidney, genitourinary conditions; diabetes; receiving dialysis, anticoagulants):
_____
Advance directives for limiting treatment (especially antibiotic use): _____
Medication allergies: _____

A **Assessment**
Vital signs: BP____/____ HR_____ Resp. rate_____ Temp._____ O_2 Sats._____

Resident WITH indwelling catheter
The criteria are met to initiate antibiotics if one of the following are selected:

No Yes
□ □ Fever of 100°F (38°C), or 2°F (1.1°C) above baseline, or repeated temperatures of 99°F (37°C)
□ □ New back or flank pain
□ □ Rigors / shaking / chills
□ □ New onset delirium (new dramatic change in mental status)
□ □ Hypotension (significant change in baseline BP or SBP <90)
□ □ Acute suprapubic pain
□ □ Acute pain, swelling or tenderness of the scrotal area

Resident WITHOUT indwelling catheter
Criteria are met to initiate antibiotics if one of the three situations are met:

No Yes
□ □ Any one of the following two:
□ Acute dysuria alone (pain or burning while urinating)
□ Acute pain, swelling or tenderness of the scrotal area
— OR —
□ □ Single temp of 100°F (38°C), or 2°F (1.1°C) above baseline, or repeated temperatures of 99°F (37°C) **and** at least one of the following new or worsening symptoms:
□ Urgency □ Suprapubic pain □ Frequency
□ Gross hematuria □ Back or flank pain □ Urinary incontinence
— OR —
□ □ No fever, but two or more of the following new or worsening symptoms:
□ Urgency □ Suprapubic pain □ Frequency
□ Gross hematuria □ Urinary incontinence

R **Recommendation**
□ **Protocol criteria met**. Resident may require UA and urine culture or an antibiotic.
□ **Protocol criteria are NOT met**. Resident **DOES NOT** need immediate antibiotic but may need additional observation.

Nurse's Signature: _____ **Date/Time:** _____
□ **Notification of Family/POA Name:** _____ **Date/Time:** _____
□ **Faxed or** □ **Called to:** _____ **By:** _____ **Date/Time:** _____

Physician Orders/Response (Please check all that apply)

□ I have reviewed the above **SBAR**.
□ Urine culture (if indicated)
□ Encourage 4oz of cranberry juice or another liquid (_____) for _____ times/day, until symptoms resolve
□ Record fluid intake & output until symptoms resolve (output can also be measured from urinal or by weighing diapers, etc.)
□ Assess vital signs, including temp; every _____ hours for _____ hours
□ Monitor and notify PCP if symptoms worsen or unresolved in _____ hours
□ Other: _____
□ For antibiotic orders (if needed) please complete script below:
Drug: _____ Dose: _____ Route: _____ Frequency: _____ Duration: _____ Indication: _____

Physician Signature:	**Date/Time:**

Please Fax Back To: _____ or □ **Telephone Order**

File Under Physician Order/Progress Notes

NEBRASKA ANTIMICROBIAL STEWARDSHIP ASSESSMENT AND PROMOTION PROGRAM ASAP

Review of Antibiotic Prophylaxis in the Management of Recurrent Urinary Tract Infections (UTI) in Adults

Continuous antibiotic prophylaxis, while effective in the short-term, carries many risks including medication side effects in older patients[1], increased risk for multi-drug resistant organisms[2], and risk for *Clostridioides difficile* colitis[3].

Before considering antibiotic prophylaxis for recurrent UTIs, these non-antibiotic measures should be attempted first:

- Confirm the resident is experiencing true UTIs, not asymptomatic bacteriuria
- Maintain adequate hydration
- Encourage regular voiding. Holding in urine or not draining the bladder fully increases the risk of UTIs
- Ensure appropriate personal hygiene practices and proper care of urinary catheters
- Avoid sitting in wet or dirty undergarments for prolonged periods
- For post-menopausal women with risk factors such as atrophic vaginitis, prescribe topical vaginal estrogens
- Evaluate for underlying risk factors that may be the reason for recurrent UTIs and manage those accordingly
- Consider evaluation for kidney stones or a urology evaluation in functional patients

Non-Antibiotic Therapies & Supplements to Prevent UTIs

Local estrogen therapy

The use of vaginal estrogen therapy has been an underutilized tool for preventing UTIs. Estrogen therapy helps maintain vaginal pH levels and bacterial flora balance. Multiple studies have demonstrated a reduction in the frequency of UTIs among postmenopausal women using topical vaginal estrogen therapy.[4,5]

Methenamine hippurate (1 gram PO twice daily)

Methenamine is hydrolyzed to formaldehyde and ammonia in acidic environments which has a bactericidal effect by denaturing proteins and nucleic acid. Therefore, acidic urine increases efficacy, so patients are often advised to consume acidic foods to maintain an acidic urinary pH. While generally well-tolerated, common side effects include gastrointestinal upset and bladder irritation. It has been described as an antibiotic-sparing option for those patients with recurrent UTIs and trials indicate it may be helpful in female patients with no urinary tract abnormalities.[6,7]

Cranberry Supplements

Cranberry may decrease the adherence of uropathogens to the uroepithelial cells due to high concentrations of proanthocyanidins (PACs). Research on cranberry effectiveness has yielded mixed results; however, several studies suggest a potential benefit in reducing the frequency of UTIs[8]. Cranberry products are available in various formulations, including juice, liquid concentrates, tablets, capsules, and powder forms. The product chosen should be evaluated to ensure it contains PACs – some cranberry flavored supplements do not actually contain any PACs. It remains unclear what the optimal dose of cranberry should be, but studies suggest that the PAC dose be at least 36 mg/day[8]. Consideration should also be given to the amount of sugar consumed daily if utilizing cranberry juice.

D-mannose

D-mannose is a sugar that mimics the host's uroepithelial receptor and competitively binds to the uropathogen decreasing bacterial attachment to the mucosa. In a 2024 randomized clinical trial of 598 women, daily d-mannose did not reduce the proportion of women with recurrent UTI in primary care who experienced a subsequent clinically suspected UTI. D-Mannose should not be recommended for prophylaxis in this patient group.[9]

Agency for Healthcare Research and Quality

OTHER RESOURCES!

TOOLKIT

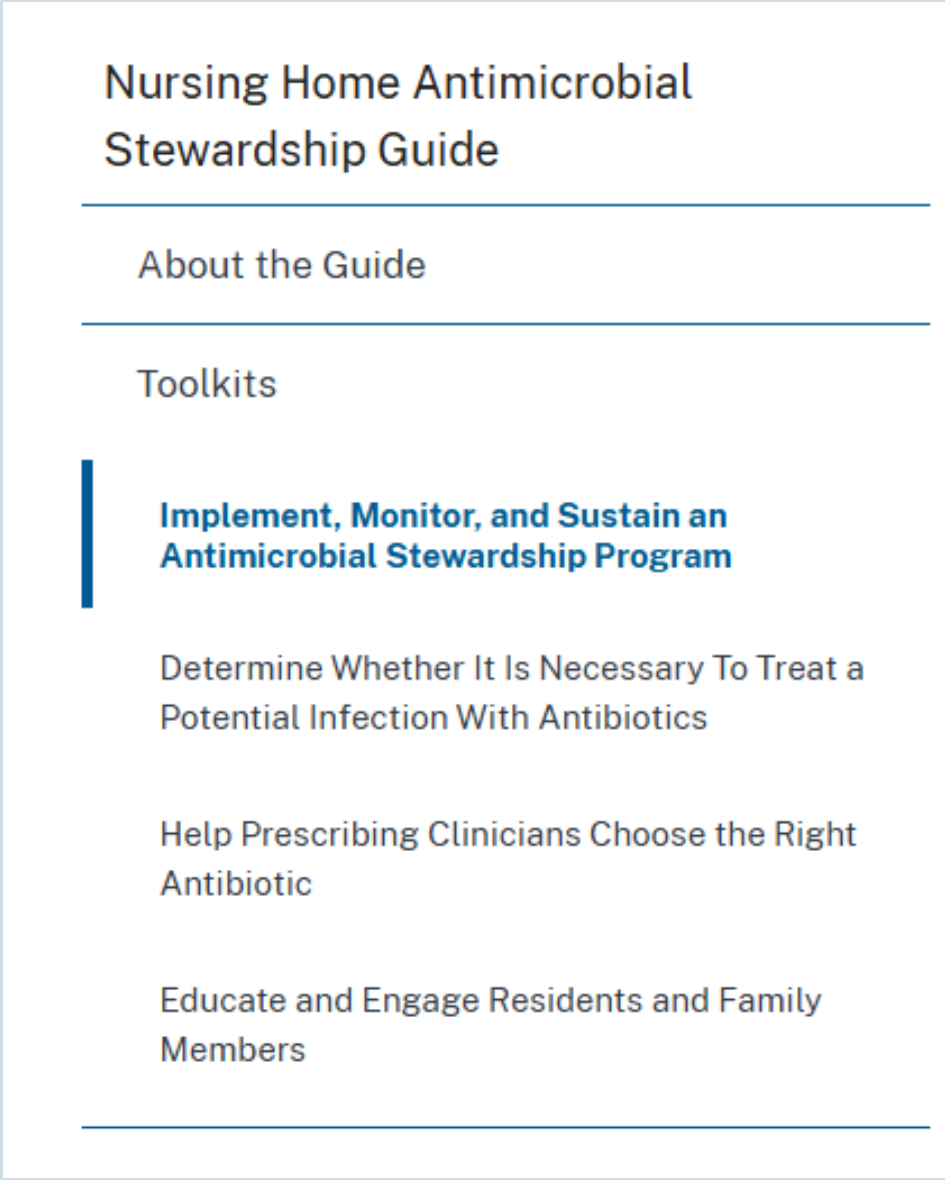
TOOLKIT 2: MONITOR AND SUSTAIN STEWARDSHIP | AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

Toolkit has resources like an agenda to guide discussion about what the stewardship team should focus on

Provides tools for antibiotic use, sample monthly summary reports, quarterly/monthly prescribing profiles

All are word/PDF documents that are fillable

Once you have your ASP team, there are other toolkits to achieve QAPI



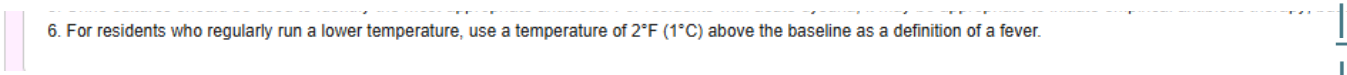
About the Nursing Home Antimicrobial Stewardship Guide | Agency for Healthcare Research and Quality

Minimum Criteria for Antibiotics Tool

What is the Communication and Decisionmaking for Four Infections Toolkit?

The toolkit is intended to help prescribing clinicians and nurses work together to determine when antibiotics are truly needed. This toolkit includes the following tools:

- **A Medical Care Referral Form** to document information for prescribing clinicians (tool 1) (PDF | Word)
- **Pocket Cards** for nurses that present 12 common situations where systemic antibiotics are generally not indicated and provides infection control guidelines (tool 2) (PDF)
- **Quality Improvement (QI) Tip Sheet** that presents discussion points for a QI meeting (tool 3) (PDF | Word)
- **Training slides** for prescribing clinicians and nursing staff (tool 4) (PPT | Word)


6. For residents who regularly run a lower temperature, use a temperature of 2°F (1°C) above the baseline as a definition of a fever.

Toolkit 2. Common Suspected Infections: Communication and Decisionmaking for Four Infections | Agency for Healthcare Research and Quality

Addressing the "how"

How Do I Implement the Toolkit?

Implementing the toolkit involves five steps:

1. **Identify Champions.** Champions help drive successful implementation by increasing staff awareness of tools and building support among leadership and nursing home staff. It is important to identify at least two champions for small- to medium-sized nursing homes (under 100 beds), and three to four for larger nursing homes (100 or more beds). These champions can be the director of nursing, assistant director of nursing, administrator, charge nurses, the medical director and/or other onsite prescribing clinicians.

2. **Introduce the tools to appropriate staff.** Training increases staff understanding of inappropriate antibiotic use and of the tools available to them. Conducting this training is important because staff are more likely to use tools they understand and know how to use. Training should include information about inappropriate antibiotic use, a description of the tools and how to use them, and a discussion about scientific evidence for the recommended best practices.

3. **Use the Medical Care Referral form.** When considering a referral, clinicians need easy access to information required for evidence-based prescribing, instead of relying on handwritten notes that may be in multiple locations. The Medical Care Referral form facilitates communication between nurses and clinicians when a resident has a suspected infection or is being transferred to an emergency department or hospital. The form documents information clinicians need for prescribing decisions and reflects evidence-based guidelines for the four types of infections[2]. Nurses should be trained on how to complete the form, and prescribing clinicians should be familiarized with its content and use it to make decisions about treatment.

4. **Refer to the Pocket Card.** Staff should understand common situations when antibiotics are unnecessary and must remain attentive to infection control guidelines. The pocket cards summarize situations in which systemic antibiotics are generally not indicated and provide infection control guidelines for Vancomycin-resistant enterococci (VRE), *Clostridium difficile* (C. diff), and Methicillin-resistant *Staphylococcus aureus* (MRSA). Nurses should be trained to use the pocket cards whenever an infection is suspected. Prescribing clinicians should also be trained to use order forms for treatment other than antibiotics when appropriate.

5. **Hold QI meetings.** Quality improvement meetings can be used to plan how to implement the intervention and to evaluate its success. The QI meetings tip sheet (tool 3) provides suggestions for how to organize these meetings.

[Toolkit 2. Common Suspected Infections: Communication and Decisionmaking for Four Infections | Agency for Healthcare Research and Quality]

These are measurable—how often was the tool or form used!

Overview of the Toolkit

Why Should a Nursing Home Use This Toolkit?

The Resident and Family Member Education toolkit helps the nursing home (1) encourage an open and respectful dialogue between nurses and prescribing clinicians and residents and their family members, and (2) help residents and family members participate in their care.

What Is Included In the Toolkit?

The toolkit provides ways to educate residents and their family members about antibiotics and the risks involved with taking antibiotics, including Clostridium difficile (or C. diff) and antibiotic resistance. The toolkit includes the following tools:

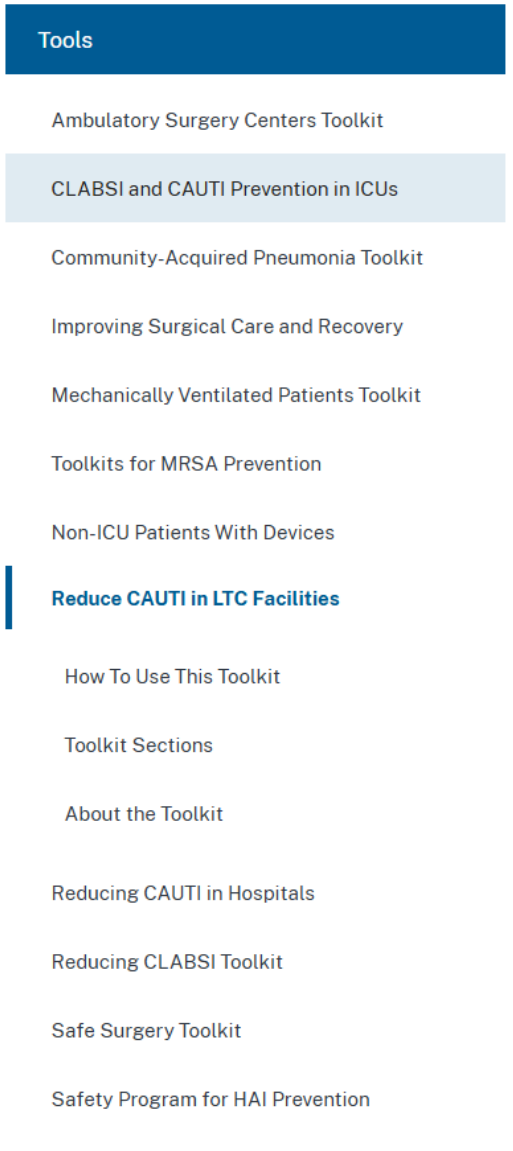
- Talking With Residents provides talking points for nurses to educate residents about antibiotics and encourage them to ask questions or report symptoms (tool 1). This tool is provided in both a:
  - Long version (PDF) (Word) and a
  - Short checklist version. (PDF) (Word)
- Talking With Residents' Family Members provides similar talking points for nurses to use when talking to residents' family members (tool 2). This tool is provided in both a:
  - Long version (PDF) (Word) and a
  - Short checklist version. (PDF) (Word)
- Resident Information Sheet: Antibiotic-Resistant Bacteria provides a template for informing and educating residents who test positive for a resistant organism (tool 3). (PDF) (Word)
- Be Smart About Antibiotics is a handout that can be given to residents to provide basic information about antibiotics and their risks (tool 4). (PDF)
- Suspect a Urinary Tract Infection?How Taking Antibiotics When You Don't Need Them Can Cause More Harm Than Good is a handout that can be given to residents to explain the risks associated with unnecessary antibiotic use to treat a suspected UTI (tool 5). (PDF)
- Managing Resident and Family Expectations provides a template to discuss the tools at a staff meeting (tool 6).
  (PDF) (Word)

On prior fishbone, I identified "misunderstanding about UTI diagnosis"—including family. "Grandma has a UTI" is a common theme for AMS diagnoses…and needs educational intervention…here's your tools!

Toolkit To Educate and Engage Residents and Family Members | Agency for Healthcare Research and Quality

Stewardship and IPC work hand in hand. Reduce CAUTI. Reduce unnecessary abx for treatment of ASB. Reduce C. diff rates from antibiotic use. Hopefully fewer MDRO…

[Toolkit To Reduce CAUTI and Other HAIs in Long-Term Care Facilities | Agency for Healthcare Research and Quality]



Conclusions

QAPI is **essential**.

There are so many toolkits, frameworks, information readily available only.

Start small with something measurable and meaningful to you/your institution.

It **will** be iterative in multiple cycles.

Don't be discouraged if something doesn't work, analyze it and tackle from a different angle.

Know that others are almost certainly working on the same thing, networking is key to figuring out what others might have done that you can replicate.