UWTASP
tele-antimicrobial stewardship program

Stewardship Outcomes

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Project ECHO®

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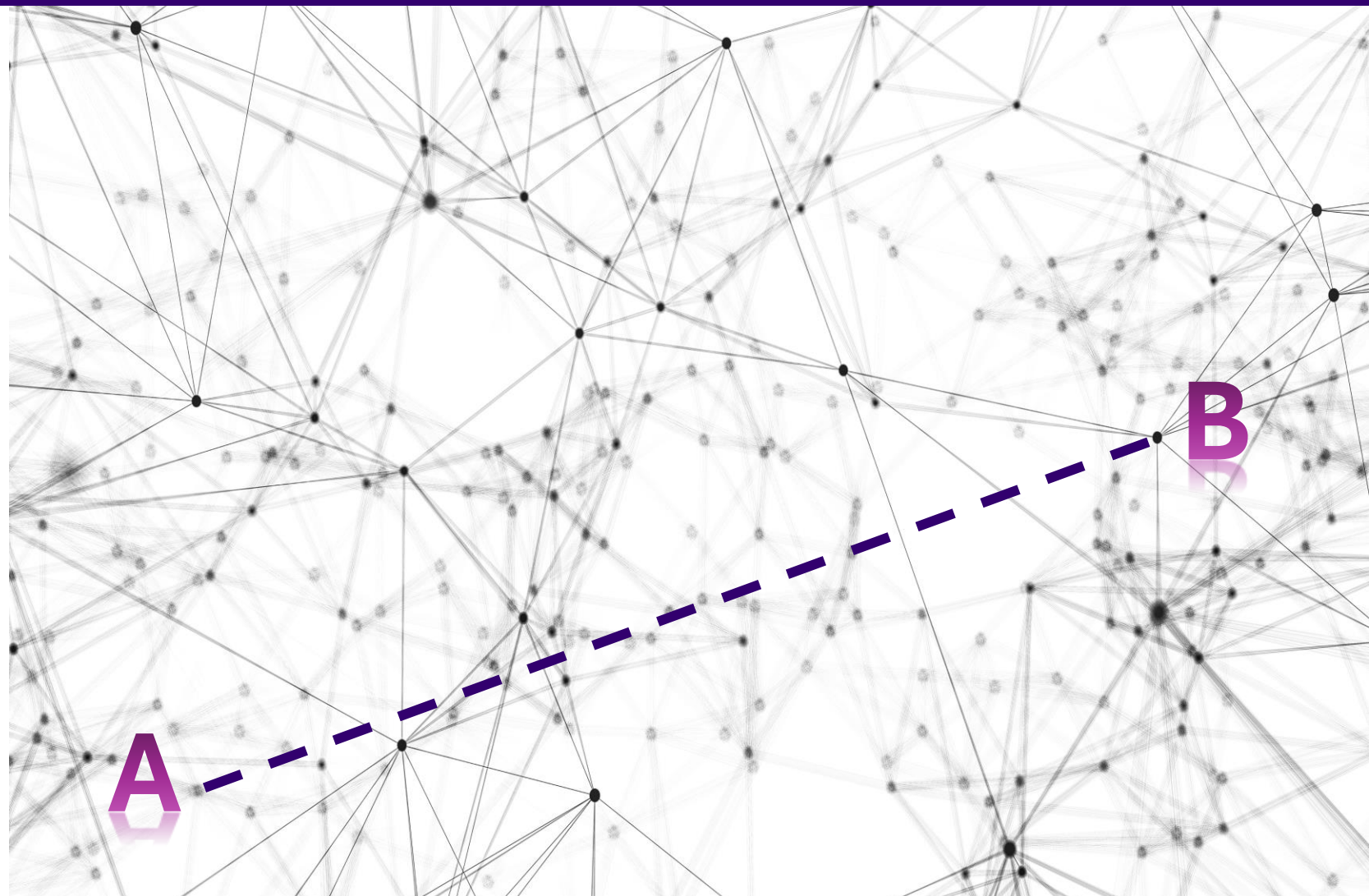
Why do we need to measure outcomes?

- Demonstrate impact
- Demonstrate continuous improvement
- Enable benchmarking between institutions

Demonstrating impact

aka: what patients and their families care about

- Mortality
- Length of stay
- Antibiotic resistance
- Hospital acquired infections
- *C. difficile* infections



Moehring R et al. Clin Infect Dis. 2016 Dec 28;64(3):377–383. doi: 10.1093/cid/ciw787

What we usually measure

process and benchmarking outcomes

- Antimicrobial use (dose and duration) e.g. DOT, DDD
- Antimicrobial appropriateness (adherence to guidelines, de-escalation)
- Expenditure (antibiotic costs / cost avoidance)
- Hospital acquired infections / *C. difficile* infection
- Readmissions

Moehring R et al. Clin Infect Dis. 2016 Dec 28;64(3):377–383. doi: 10.1093/cid/ciw787

Dodds Ashley E, et al. Clin Infect Dis. 2014;59(S):S112-21.

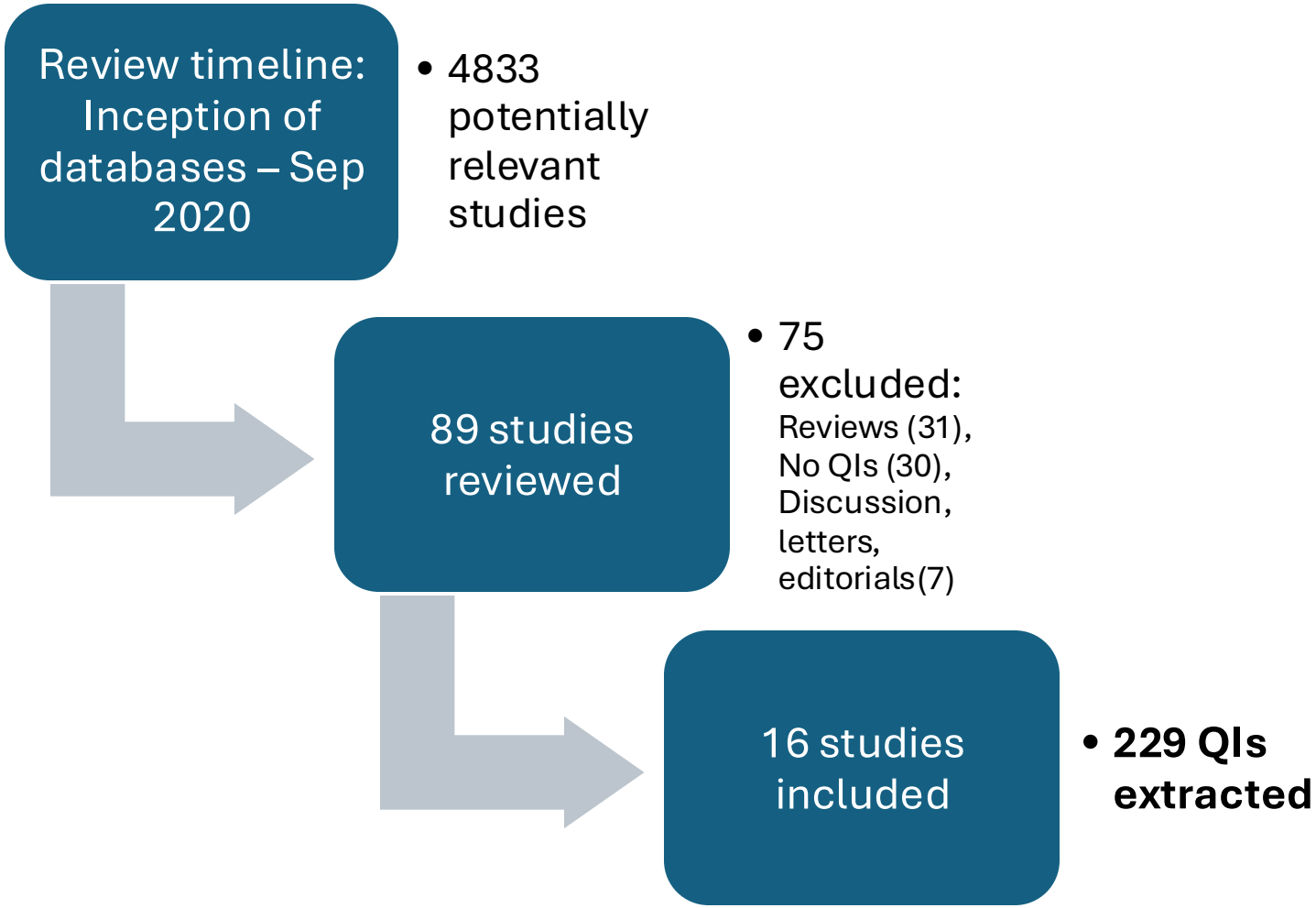
Quality Indicators for hospital antimicrobial stewardship programmes

Quality Indicator (QI): Measurable elements of practice performance for which there is evidence or consensus that they can be used to assess the quality of care provided

- Evidence-based OR Defined by consensus among expert panels (e.g. Delphi methods)
- Acceptable, Feasible, Reliable, Reproducible, Validated
- Consistent and Credible

O'Riordan F et al. J Antimicrob Chemother. 2021 May 12;76(6):1406-1419.doi: 10.1093/jac/dkab034.

Systematic Review of the Literature



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229 Quality Indicators, 1% Outcomes-based

PROCESS General clinical management of all infections or specific infections or patient populations	172/229 **(75%)**	• Infection diagnostics • Pharmacy-supported interventions • Elements of good prescribing practice • Specific infection-related indications
STRUCTURAL Organizational framework, resources, activities needed to implement ASP	55/229 **(24%)**	• AMS governance • Leadership and accountability • Expertise and resources • Policies and programs • Guidelines • AMS education • Microbiology laboratory standards • Resistance surveillance
OUTCOME Rate of clinical outcomes	2/229 **(1%)**	• Clinical outcomes of patients receiving antibiotics • Rate of nosocomial *C. difficile* infection

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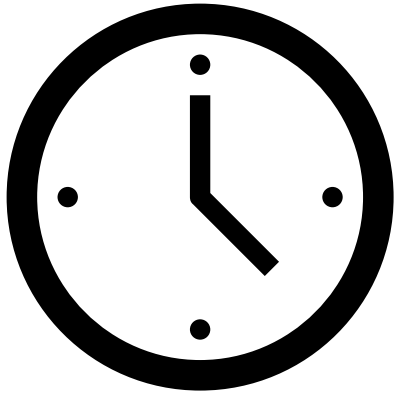
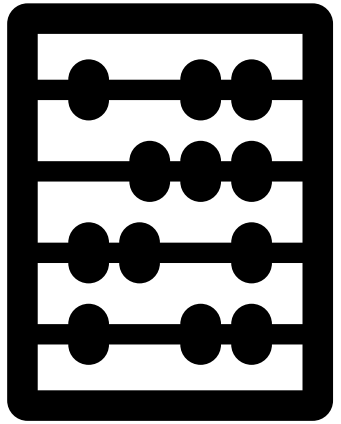
Meaningful outcomes require time and numbers

For example: Penicillin allergies and surgical site infections

Conclusion: Patients with a reported penicillin allergy had a 50% increased odds of SSI



Surgical patients at Mass Gen Hospital
2010 - 2014



N = 8385 patients, 9004 procedures

Blumenthal KG. Clin Infect Dis 2017 Oct 9;66(3):329–336. doi: 10.1093/cid/cix794

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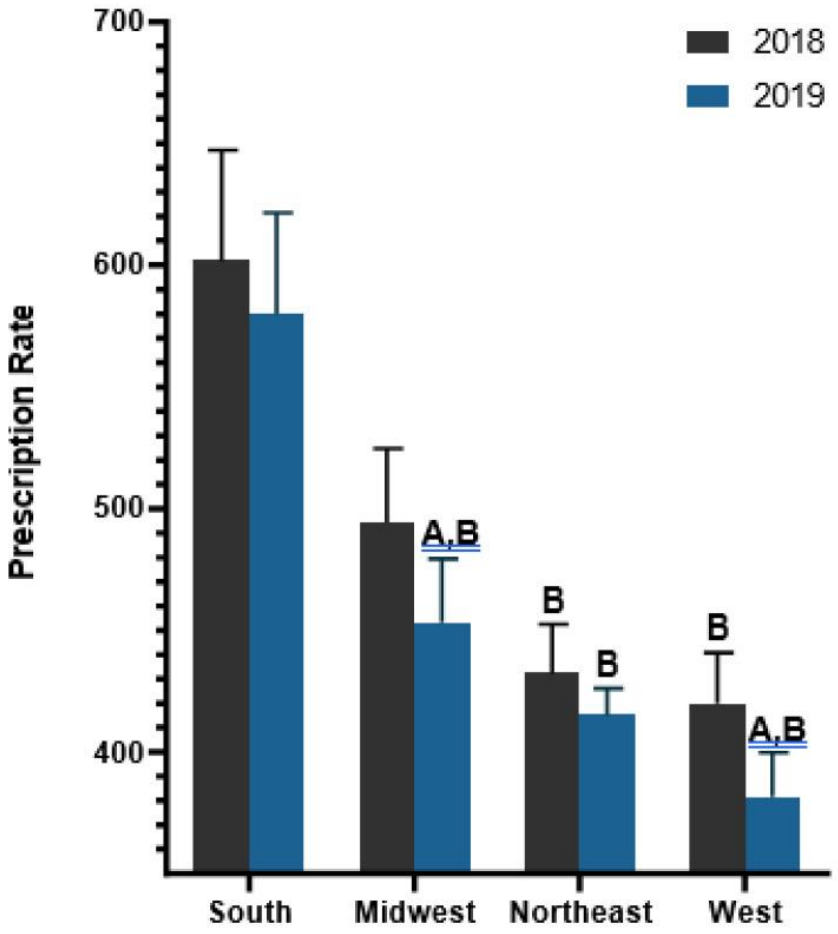
Outcomes and antibiotic resistance may be system issues unrelated to the quality of care at an institution



Antibiotic prescribing per 1000 Medicaid enrollees by census regions.

A $p < 0.05$ difference within the region.

B $p < 0.05$ difference compared to the South.

Aguilar AG et al. Pharmacy. 2024 Mar 1;12(2):46. doi: 10.3390/pharmacy12020046

Ayukebong. Antimicrob Resist Infect Control. 2017 May 15;6:47. doi: 10.1186/s13756-017-0208-x

https://www.thelancet.com/journals/laninf/article/PIIS1473309905702176/abstract

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How do we judge antimicrobial stewardship programs?

Core Elements of Antimicrobial Stewardship

- Leadership commitment
- Accountability
- Pharmacy expertise
- Action
- Tracking
- Reporting
- Education

Centers for Disease Control and Prevention. https://www.cdc.gov/antibiotic-use/hcp/core-elements/hospital.html. Updated 15 Sep 2025.

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Uptake of all 7 Core Elements

Nationally = 41% in 2014 | 95% in 2021

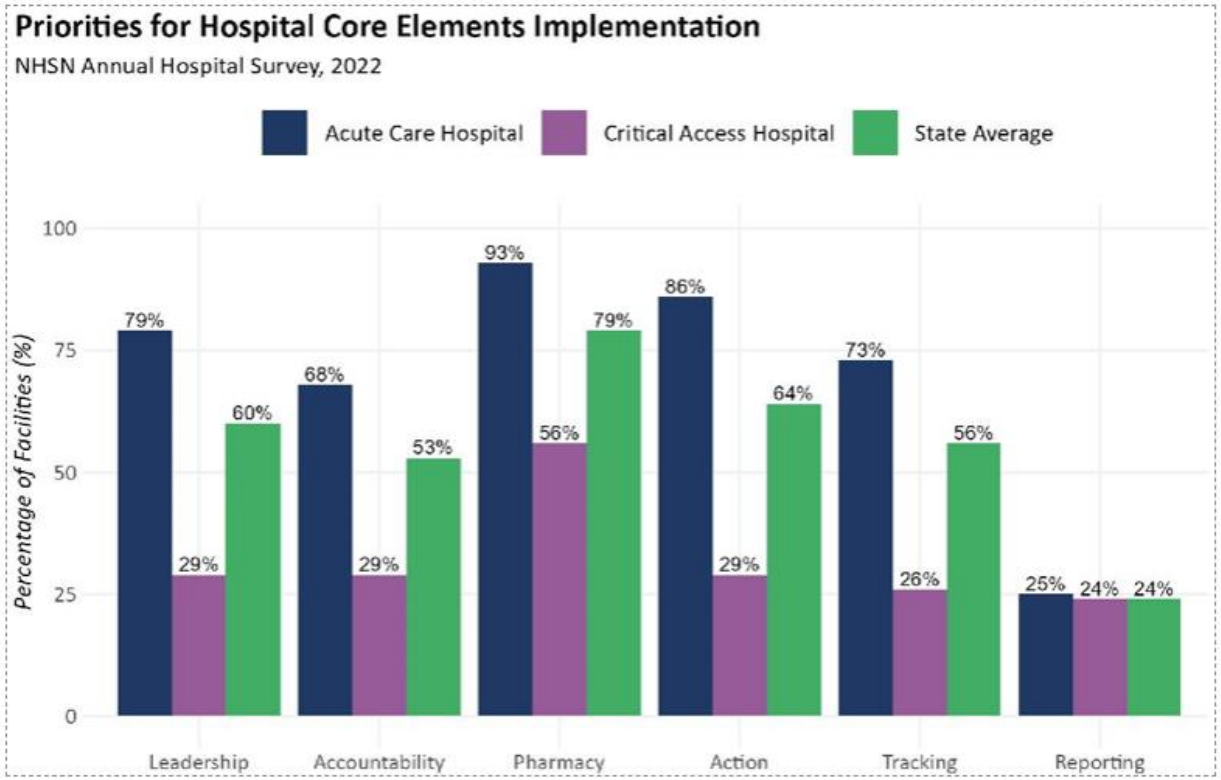

Figure 1. Priorities for hospital core elements implementation stratified by facility type, NHSN Annual Hospital Survey 2022.* *Federal facilities excluded.

Zering J, Kamenar K, et al. Open Forum Infect Dis. 2025;11;ofad684. https://doi.org/10.1093/ofid/ofae359

O'Leary E, eta al. 2024. Open Forum Infect Dis.;11(2): ofad684. doi: 10.1093/ofid/ofad684

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Priorities for Hospital Core Element Implementation (2022)

Hospital Core Elements (2014)	Priorities for Core Element Implementation (2022)
Pharmacy/Stewardship Expertise	
Appoint a pharmacist, ideally as co-lead of program	Co-leaders have completed **ID training or certificate**
Action	
Implement interventions like prospective audit and feedback	**Facility-specific treatment recommendations** for common clinical conditions
Tracking	
Monitor prescribing and impact of interventions	Submit data to **NHSN AUR**
Reporting	
Regularly report antibiotic use and resistance to hospital clinicians and leadership	Monitor **adherence to facility-specific treatment recommendations**

Centers for Disease Control and Prevention. https://www.cdc.gov/antibiotic-use/hcp/core-elements/hospital-implementation.html. Updated 18 Mar, 2024.

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UW-CSiM and Core Element Outcomes

Priorities for Core Element Implementation (2022)

Stewardship Expertise

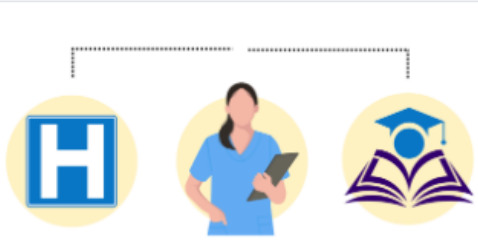
Co-leaders have completed **ID training or certificate**

Action

Facility-specific treatment recommendations for common clinical conditions

Reporting

Monitor **adherence to facility-specific treatment recommendations**



New Courses: Stewardship for Nurses!

2025 Antibiotic Guide Available Now

Under construction, coming soon

https://uwcsim.org/

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Uptake of all 7 Core Elements 95% in 2021

We need to be ready to assess new metrics and/or to justify process and structural quality indicators

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CORE ELEMENTS

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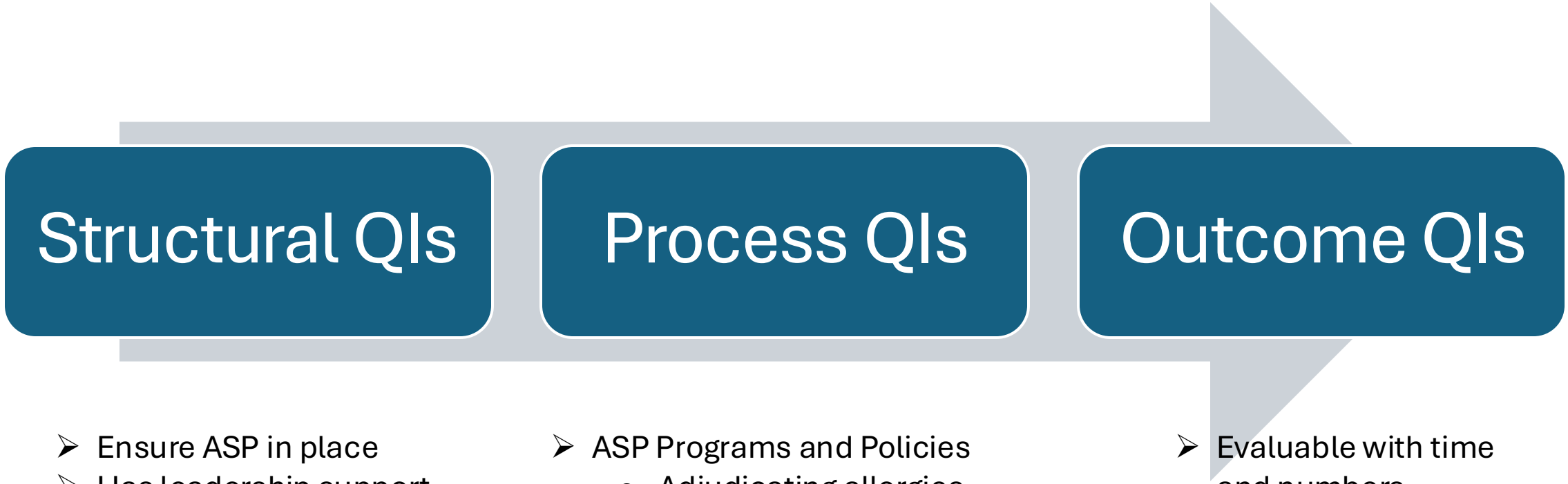
QI Roadmap:

By focusing on process measures we can control, we will improve patient outcomes and reduce patient harms



- Ensure ASP in place
- Has leadership support and commitment
- Meets Core Elements

- ASP Programs and Policies
  - Adjudicating allergies
  - Avoiding overdiagnosis of UTI
  - Stewardship education
  - Antibiotic time-outs
  - IV to PO protocols

- Evaluable with time and numbers

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Takeaways:

Assess your program from a QI perspective: Structural, Process, Outcome

- Is your program meeting the Core Elements (structural QIs)? If not, where are your gaps?
- What processes do you and/or your ASP do and can they serve as measurable QIs at your hospital?
- What are the most relevant and important quality indicators of your antimicrobial stewardship program?
- What clinical outcomes are a good (or not good) measure of quality of your stewardship program?