ANTIBIOTIC STEWARDSHIP PROGRAM IMPLEMENTATION
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Note: The term “antibiotic” and “antimicrobial” are used interchangeably throughout this publication and denote the same intent.

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Antibiotic stewardship programs are designed to optimize clinical outcomes while minimizing the unintended consequences of antimicrobial use and reduce health care costs without adversely affecting the quality of care provided. Striking this balance is critical to the larger population health issue of the evolution of antibiotic resistant “super bugs.” Thus, ASPs align well with the Triple Aim — better health, better care and lower costs (Figure 1). Antibiotic resistance in the U.S. costs an estimated $20 billion a year in excess health care costs, $35 million in other societal costs and more than 8 million additional hospital days.1

The population health repercussions of widespread, untargeted use of antimicrobials is concerning considering the lack of new antibiotic discoveries of any significance in the last 30 years. The World Health Organization now sites antibiotic resistance as a “major threat to public health globally.”2iii Not since the time of the discovery of penicillin has the world seen such broad and effective medications to treat infections (Figure 2). However, even the powerhouse penicillin was not immune to developing resistance issues; within 10 years of penicillin’s discovery in 1928, group A streptococci and pneumococci already had developed modes of resistance. What is new is the growing magnitude of the problem, the speed with which new resistant pathogens are emerging and the decline in new antibiotic research and development, until a recent presidential call-to-action, and the development of legislative action and funding to promote optimized use and control of antibiotics.

FIGURE 1: The Triple Aim

1. Improves Patient Care and Outcomes
2. Reduces costs
3. Improves Health of a Community

...and it is Simply the Right Thing to Do.

Source: Alabama Hospital Associationiv

FIGURE 2: Antibiotic Discovery and Resistance Timeline

Source: Public Health Englandiv
The list of resistant bacteria continues to grow, with the Centers for Disease Control and Prevention assessing hazard levels as urgent, serious or concerning (Figure 3). Internationally, antibiotic resistance is viewed as such a significant threat that a British group, The Longitude Prize, has offered a 10 million pound ($11,137,953) reward for anyone who can develop a point-of-care diagnostic test that will conserve antibiotics for future generations and revolutionize the delivery of global health care. The test must be accurate, rapid, affordable and easy to use anywhere in the world, which is no small feat.


Source: CDC
One of the first strategies to address antibiotic resistance is to focus efforts on robust diagnostics, assessment and symptom differentiation with conservative, targeted prescriptions. This requires physicians, pharmacists and other health care workers to update their practices based on the evidence and recommended best practices. Change in health care procedure is predicated on data, and the evidence for antibiotic stewardship is well-established through a variety of field experts, including the CDC, the Infectious Disease Society and the Association for Professionals in Infection Control and Epidemiology. Despite robust evidence, practitioners admit to feeling pressured by patients and to writing prescriptions without diagnostic medical necessity, fearing patient experience satisfaction scores will suffer. Instead of giving in to incorrect patient expectations, practitioners should strive to understand the motivations of patients who seek antibiotics and provide education, empathy and alternative treatments. Pharmacists, health care workers and other community stakeholders can play a role in supporting practitioners prescribing practices that promote antibiotic stewardship through patient and community education efforts. The CDC’s Get Smart Campaign shows Missouri as prescribing antibiotics at higher than average rates when compared nationally (Figure 4).

FIGURE 4: Community Antibiotic Prescribing Rates by State, 2013-2014

Source: CDC
One of the components necessary to achieve antibiotic stewardship (Figure 5) is an urgency to achieve true compliance and accountability toward infection control practices by all health care workers, including ancillary and support service departments. Cleaning, disinfection and transmission prevention tactics are just as important to antibiotic stewardship as antimicrobial management.

The CDC’s Core Elements of Hospital Antibiotic Stewardship Programs is used in this immersion project as the preeminent source of recommended evidence-based practice with support from many other field experts. Leadership commitment at the hospital level, community partner engagement and patient education are necessary to mitigating antibiotic resistance. Engaging subject matter experts across the care continuum also is essential; pharmacists and infectious disease specialists play a critical role, and their expertise should not go underutilized.

Preventing the spread and resistance of bacteria, such as *C. difficile*, cannot be managed in a vacuum. Patients infected with *C. difficile* and their health care access patterns should be assessed to understand causality and to identify opportunities for education and collaboration across health care settings and for care in the home.

The Antibiotic Stewardship Immersion Project seeks to support hospitals and other health care settings to understand the context of the growing issue of antibiotic resistance and the key practices and processes to promote stewardship. Immersion projects structure critical elements for success into manageable segments for team implementation that is time-limited and supported by ongoing education, distillation of value-added resources and shared learning across the cohort of participants. The journey is fast-paced, intense and multidisciplinary, promoting rapid cycle improvement and high reliability organization principles.

We look forward to supporting hospital members through this work and encourage active participation throughout the project.

FIGURE 5: Four Drivers of Antibiotic Stewardship Contributing to Population Health

- Infection Control Practices
- Conservative Prescribing Practices
- Population Health Through ASP
- Community Education
- Research and Development of Diagnostics and Treatments

Source: Missouri Hospital Association
PROJECT GOALS
- reduce nonmedically indicated prescription of antibiotics while optimizing treatment of infections
- reduce inaccurate prescription of antibiotics and adverse events related to their use
- reduce the incidence and prevalence of *C. difficile* infection and antibiotic resistance, both hospital- and community-acquired
- reduce costs incurred without adversely affecting the quality of care
- optimize data collection and reporting through the National Healthcare Safety Network’s Antimicrobial Use and Resistance Module

PROJECT TIMELINE
Nov. 1, 2016 through Aug. 31, 2017 (10 months)

PROJECT IMPROVEMENT METHODOLOGY
Immersion Projects use a rapid process improvement model designed to seek incremental changes toward an end improvement goal. Cycles of 90 days will be used with learning and action components based on the Institute for Healthcare Improvement’s Breakthrough Series Model (Figure 6).

FIGURE 6: IHI’s Breakthrough Series Model

Source: IHI

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*Quality Works*
Based upon recommended evidence-based practices, this immersion project is broken down into manageable, actionable phases and tasks to be implemented by a multidisciplinary team. Ongoing learning phases include a schedule of didactic learning opportunities based on the tasks provided by subject matter experts through virtual “huddle” webinars to:

- provide educational insight, research on evidence-based practice and subject matter expertise on specific tasks
- review and discuss data outcomes relative to the project
- provide a platform for shared learning, barrier mitigation and sharing of successes
- provide structure and momentum to keep the project moving forward
- provide resources and opportunity for questions and answers

Additionally, scheduled mentor–participant coaching calls and site visits are completed to review hospital-specific needs and successes.

**PROJECT INTERVENTIONS**

The following project interventions primarily are based on the CDC’s Core Elements of Hospital Antibiotic Stewardship Programs, as well as additional consideration for return on investment and total costs.

- leadership commitment to dedicating human, financial and I.T. resources
- accountability through appointment of program leader responsible for program outcomes
- drug expertise through pharmacy leader engagement
- action by implementing recommended process improvements to achieve outcomes
- tracking antibiotic prescribing, resistance patterns and financial metrics to provide guidance based on data to providers and stakeholders
- reporting through structured communication channels to stakeholders on identified metrics
- education to stakeholders, including community stakeholders, regarding optimal antibiotic use based on medical necessity and the risk of identified resistant organisms and *C. difficile*

**PROJECT MEASURES**

- antibiotic consumption measures
- antibiotic stewardship compliance measures
- *C. difficile* rates correlated to antibiotic usage
PROJECT OUTCOME MEASURE
- *C. difficile* mortality rate, or
- *C. difficile* standardized infection ratio (for NHSN reporting hospitals)

RECOMMENDED RESOURCES AND TOOLKITS
This project workbook is based on, and adapted from, the following resources.

- Centers for Disease Control and Prevention — Core Elements of Hospital Antibiotic Stewardship Programs
- American Hospital Association Physician Leadership Forum — Appropriate Use of Medical Resources Antimicrobial Stewardship Toolkit
- A Hospital Pharmacist’s Guide to Antimicrobial Stewardship Programs
- Greater New York Hospital Association United Hospital Fund — Antimicrobial Stewardship Toolkit - Best Practices from the GNYHA/UHF Antimicrobial Stewardship Collaborative
- National Quality Partners Playbook: Antibiotic Stewardship in Acute Care
- The Joint Commission — Module 1: Healthcare Organization Infection Prevention and Control Programs: Essential Partners of Antimicrobial Stewardship Programs
- Antimicrobial Stewardship Programs in Health Care Systems
- National Strategy for Combating Antibiotic Resistant Bacteria
- The Centers for Medicare & Medicaid Services Proposed Rule — Medicare and Medicaid Programs; Hospital and Critical Access Hospital Changes To Promote Innovation, Flexibility and Improvement in Patient Care
- Infectious Diseases Society of America — Combating Antimicrobial Resistance: Policy Recommendations to Save Lives
- Policy Statement on Antimicrobial Stewardship by the Society for Healthcare Epidemiology of America, the Infectious Diseases Society of America, and the Pediatric Infectious Diseases Society
- American Society of Health-System Pharmacists Statement on the Pharmacist’s Role in Antimicrobial Stewardship and Infection Prevention and Control
- Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America
PHASE 1: READINESS

PHASE 2: RECOGNITION

PHASE 3: RESPONSE
TASK #1: FORM THE PROCESS IMPROVEMENT TEAM AND COMPLETE THE TEAM CHARTER

**Recommended Team Members and Stakeholders**

A preexisting pharmacy and therapeutics committee may be an appropriate place to guide the implementation of an ASP; however, additional team members should be added to ensure a multidisciplinary point-of-view is achieved. Additionally, an ASP leader responsible for outcomes and reporting to the executive and hospital board level must be identified and documented as part of the hospitalwide Quality Assurance and Performance Improvement plan.

- physician champion(s)
- quality/performance improvement staff
- executive champion
- pharmacist(s)
- environmental services department staff
- emergency department champion
- infection preventionist
- nursing department champion(s)
- finance champion
- surgical services department champion
- IT department staff (adhoc)
- epidemiologist (adhoc)
- medical billing/coding staff (adhoc)
- laboratory staff (adhoc)

Return the Team Charter form to your project mentor **within the first 45 days** of the project.

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**TASK #2: COMPLETE A MINI-FAILURE MODES EFFECTS ANALYSIS AND A GAP ANALYSIS**

- Return the Mini-Failure Mode Effects Analysis to your project mentor **within the first 60 days** of the project.
- Complete the ASP Survey **within the first 45 days** of the project.
- Consider existing organizational barriers, how project interventions could fail and develop solutions to eliminate or mitigate these issues proactively.
- Consider addressing priority issues prior to beginning the project to increase the success rate of implementing the recommended strategies.
- Develop structured communication pathways designed for the greatest efficiency. Poor communication is the number one identified contributor to patient harm and failed process improvement plans. Consider upstream and downstream communication needs to encourage implementation, buy-in and efficiency.
- Reference this CDC comprehensive gap analysis tool to assess current ASP status and opportunities.
TASK #3: FORMALIZE HOSPITAL LEADERSHIP ENGAGEMENT AND COMMITMENT

Leadership engagement and commitment includes the following.

- A formal commitment to implementing an ASP. For example, make a formal statement to hospital providers and staff regarding the ASP components, include the ASP on the organization's strategic plan, and include project metrics on quality dashboards with executive and board-level review. A published example of one health system's approach can be found online.
- Collaboration with physician and organization leaders to provide necessary resources, including human, financial and I.T. resources to implement ASP components.
- Identification, endorsement and appointment of organizational staff to serve as the ASP leader. A physician or pharmacist is recommended.

TASK #4: IMPLEMENT POLICIES THAT SUPPORT MEDICALLY-NECESSARY ANTIBIOTIC PRESCRIPTION WHILE OPTIMIZING PATIENT OUTCOMES

- Order sets and clinical decision support tools developed around recommended, evidence-based practices that provide electronic medical record logic algorithms supportive of prescribers are conducive to developing high reliability practices.
- An organizational antibiogram is recommended to help direct use patterns. An antibiogram, along with a patient's personal infection history, can be used to guide empiric therapy and to monitor antibiotic susceptibility trends within your facility. An antibiogram also can serve as an alternative to a culture and sensitivity report until the results of a C&S are available, or if a C&S report notes no organism has grown despite high clinical suspicion of an infection. Stratified or nonstratified antibiograms may be used.
- Engage the microbiology department of the hospital laboratory to provide susceptibility and resistance antibiogram information and then put it into a usable form for clinicians.
  - Antibiogram resources:
    - Understanding an Antibiogram presentation (Presbyterian College of Pharmacy)
    - Agency for Healthcare Research & Quality's Concise Antibiogram Toolkit (This is nursing home-based; however, it is a good resource for developing an antibiogram with software resources.)
Examples that could be considered as part of policy and order set development include:
- hard stops, including prior authorization requirements and/or prospective audit and feedback intervention
- care bundles
- antibiotic “timeouts”
- auto IV to PO antibiotic substitution when appropriate
- antibiotic cycling is mentioned in the literature, but is not recommended by IDSA or SHEA
- education feedback strategies are mentioned in the literature, but are not recommended by IDSA or SHEA

Interventions generally can be divided into three categories: broad spectrum, pharmacy-driven protocols and infection/syndrome specific, and should promote optimal antibiotic selection: dosing, duration and route.

Empiric use recommendations should be outlined along with hard stops and triggers to review laboratory culture results.

Policy development should include formulary review by a pharmacist along with identification of formulary review frequency as it relates to an ASP.

Policies should cover accountability and the process for addressing provider noncompliance with policy and practice changes.

A sample policy can be found online. Johns Hopkins has a very comprehensive example of ASP guidance.

**TASK #5: COMPLETE A GAP ANALYSIS OF STANDARD PRECAUTIONS COMPLIANCE**

- Use of consistent and careful standard precautions is the first intervention to prevent infection and avoid the need for antibiotics. Hand hygiene in particular is cited as the number one preventive factor in infection transmission; however, national rates of provider/hospital hand hygiene compliance is estimated to be only 40 percent.
- Collect baseline hand hygiene data, ideally for a minimum of one quarter, reported by month. **Report this information to your project mentor as part of the project data set.**

Standard infection control precautions are outlined in Table 1. Organizations need to collect and analyze data regarding compliance to standard precautions as part of baseline data collection and identify gaps in care to inform infection control planning.

**TABLE 1: Infection Prevention and Control Methods for Controlling Antimicrobial Resistance in Hospitals**

| Hand hygiene |
| Contact (i.e., barrier) precautions |
| Active surveillance for and decolonization (i.e., eradication) of multidrug-resistant organisms |
| Perioperative antimicrobial prophylaxis |
| Implementation of best practices for invasive procedures and devices (e.g., removal of unnecessary central catheters, oral disinfection with chlorhexidine for patients on ventilators) |
| Disinfection and sterilization of medical devices |
| Environmental cleaning |

Source: Infectious Disease Clinics of North America
Project participants should monitor hand hygiene compliance and isolation precautions at scheduled intervals. A minimum of monthly observation-based audits are recommended for data submission to your project mentor, ideally using the Qualaris hand hygiene audit tool.

Hand Hygiene Resources: [CDC Guideline for Hand Hygiene in Health-Care Settings](https://www.cdc.gov/hai/prevention/handhygiene/index.html)

Other current, preexisting infection control areas to review for gaps include:

- pre- and peri-operative antimicrobial prophylaxis and surgical-related infection prevention
  - [Guideline for Prevention of Surgical Site Infection, 1999](https://www.cdc.gov/hai/guidelines/surgical-site-infection/index.html)
- invasive procedures and care of indwelling objects, i.e., central lines, Foley catheters, ventilators, etc.
- environmental cleaning, disinfection and sterilization of medical devices and instruments
  - [CDC Guidelines for Environmental Infection Control in Health-Care Facilities (specifically pg. 117-145)](https://www.cdc.gov/hai/guidelines/environmental/infection-control-hfac.html)
  - [CDC Environmental Checklist for Monitoring Terminal Cleaning](https://www.cdc.gov/hai/guidelines/environmental/infection-control-hfac.html#hfac-checklist)
  - [Environmental Cleaning Worksheet (Excel version)](https://www.cdc.gov/hai/guidelines/environmental/infection-control-hfac.html#hfac-checklist)

Complete recommended [Gap analysis tool](https://www.cdc.gov/hai/guidelines/gap-analysis.html) and return to your project mentor by the end of the first quarter.

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**TASK #6: COMPLETE BASELINE DATA COMPILATION AND ANALYSIS OF CURRENT ASP RELATED MEASURES**

The NHSN’s AUR Module is the nationally recommended data repository and it aligns with state final and federal proposed reporting requirements. Additionally, reporting through NHSN contributes to standardized metric collection. Hospitals reporting to NHSN are encouraged to contact their project mentor for instructions on conferring data transfer rights for the purposes of the project.

[NHSN AUR Resources](https://www.cdc.gov/nhsn/aur/)

The project will track the following metrics for the purposes of reporting on the project cohort and require hospitals to submit this data monthly as part of the rapid process improvement methodology.

- **Antibiotic Consumption Measures** – organizations may choose to select a subset of antibiotics and organisms to review based on known consumption rates, incidence of misuse, and/or bacterial prevalence, and submit data based on that subset. The only caveat is to remain consistent on that subset throughout the project to not skew data.
  - days of therapy: number of (targeted) antibiotics administered per 1,000 patient days
- number of medically necessary antibiotics per total antibiotics administered per 1,000 patient days
- antimicrobial expenditures per discharge defined as those antibiotics administered versus total antibiotic purchasing data (pre-project and at end of project)
- total number of intravenous antimicrobial doses correlated with *C. difficile* infection

**ASP Policy Compliance Measures**
- percent adherence to organization-specific treatment recommendations, antibiogram, etc. (susceptibility, dose, duration and medical necessity). Reported as number in compliance/total number of antibiotics administered x 100.
- infection control practice data: hand hygiene, isolation precautions, cleaning/disinfection practices, etc., ideally reported through the Qualaris application

**Project Outcome Measures**
- *C. difficile* mortality rate, or
- *C. difficile* standardized infection ratio (for NHSN reporting hospitals)

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**TASK #7: COMPLETE PDSA REVIEW OF PROJECT IMPLEMENTATION TO DATE**

Return the [PDSA form](#) to your project mentor according to timeline.
PHASE 1  READINESS
PHASE 2  RECOGNITION
PHASE 3  RESPONSE
RECOGNITION PHASE

GOAL
Provide education, create situational awareness of the issue and communicate the implementation plan to those who need to deploy it.

TASK #1: SELECT EDUCATIONAL RESOURCES TO BE USED FOR STAFF EDUCATION

- APIC has a concise ASP and C. difficile research article suitable for staff education.
- Education materials should be visually appealing, simple and specific. Provide adequate time and platforms to review evidence-based practice recommendations, policies and order sets.
  - Consider a project mascot to promote awareness and teamwork.
  - Consider signage, poster or sticker options to drive practice implementation, create awareness and provide visual cues.
  - Make education interesting and fun. For example, play a trivia game with teams to review evidence-based information, policy information, etc.
  - Share patient case studies — ideally from your organization — with staff to provide real-life examples and provide opportunity for discussion, questions and answers.
  - The CDC has a good document to share among staff.
- Select front-line staff to help lead educational efforts, champion the care changes and potentially assist with data collection.
- Educate on the following.
  - diagnostic and treatment algorithms, as well as any organizational antibiograms
  - how to approach providers not complying with ASP policies and chain-of-command
  - how staff and providers will be held accountable for adhering to recommended practices (high reliability organization principles)
- Define who will manage provider education and how, when and where this will be deployed.

TASK #2: COMPLETE STAFF EDUCATION SURVEY REGARDING THEIR UNDERSTANDING OF ASP PRINCIPLES AND ORGANIZATIONAL POLICIES

- For front-line staff, the trivia game option previously mentioned is a great way to easily assess staff understanding. Another option is a matching game with bacteria and isolation precautions or bacteria/illness paired to recommended antibiotics using the antibiogram (or not using an antibiotic if not medically indicated).
- Medical staff benefit from quick, accessible and easy-to-use tools.
  - “Cheat sheets” are helpful. One example can be found online from Wellington ICU. These should be developed in conjunction with an understanding of an organization’s antibiogram.
  - Including pharmaceutical cost indicators also is helpful as noted in this resource.
Antibiotic Stewardship Program Implementation

- Environmental and support services staff should be educated and prove competency on cleaning and disinfection practices, as well as the rationale for these practices upon orientation and at least annually.
  - APIC has excellent resources for this audience.

**TASK #3: SELECT PATIENT AND FAMILY EDUCATION RESOURCES**

- Educating the community about appropriate antibiotic use and selection is important to gain buy-in towards achieving stewardship aims.
- Educate on the following, at a minimum, through various venues (signage, flyers, social media, etc.)
  - When antibiotics should and should not be prescribed and why prescribing practices have changed.
  - Therapies to help combat common illnesses where antibiotics previously were prescribed, but are ineffective and not medically necessary.
  - The Choosing Wisely campaign, in collaboration with *Consumer Reports*, has a wealth of patient education available, including videos, flyers and brochures.
- For hospitalized patients, teach them to be a “safe patient.”
  - The CDC has several educational tools to help provide health literacy education on infection prevention and medically necessary antibiotic use.
  - [Safe Patient Flyer](#)
  - [AHA's ASP Toolkit](#)

**TASK #4: DEPLOY TRACKING TOOLS TO MONITOR PROJECT METRICS, INCLUDING OBSERVATION-BASED AUDITS OF STANDARD INFECTION CONTROL PRACTICES**

- Identify who will track data related to antibiotic usage. Determine when, where and how the data should be reported within the hospital and who will report it to the project mentor for project participation on a monthly basis.
- Use of clinical decision support tools within the EHR have proven effective in managing antibiotic use and is a recommended practice to support high reliability organization principles. The CDC has a comprehensive review of several studies available on this topic.
Web-based applications are becoming more prominent (QUALITY WORKS® does not advocate for, promote or assume confidence in any application listed. Each should be vetted through the individual organization.) A few examples include:

- The Antimicrobial Stewardship Program at Nebraska Medicine
- Spectrum MD
- Sinai Health System - University Health Network Antimicrobial Stewardship Program
- The Sanford Guide App
- JohnsHopkinsABX
- Teqqa iAntibiogram

Within the hospital EHR, what kinds of reports can be developed and reviewed related to antibiotic stewardship?

- Can an alert be sent when a C&S report is final to prompt antibiotic review?
- Can an alert be sent to prompt pharmacy and clinician review of antibiotic use after a defined time period? An auto-stop of the medication may not be the best solution if the patient still needs treatment.
- How are pharmacy staff communicating with prescribers on clinical decisions?
- How are standard infection control compliance data collected and communicated? Is there a way to track this through the EHR?
- Are protocol(s) and/or order set(s) used appropriately and timely? Are antibiotics that were started empirically re-evaluated when culture results are available?

Validate audit tool(s). If using EHR-documented data, are the reports downloading correct information? Is the correct data being collected if using a manual audit process? Is data missing? Why? How can this be corrected to get the most accurate information?

Observation-based audit tools that are electronic with automated reporting are recommended to promote just-in-time education and highly reliable care. Discuss with staff the purpose of observation-based audits to provide coaching, optimize quality of care and ensure patient safety.

- For patients requiring IV antibiotics, consider using Pharmacokinetic Monitoring and Adjustment programs, particularly for aminoglycosides and vancomycin, as part of the ASP.
TASK #5: MAINTAIN A HIGH LEVEL OF SITUATIONAL AWARENESS BY REVIEWING ANTIBIOTIC USE, MEDICAL NECESSITY AND SELECTION IN UNIT HUDDLES, INTERDISCIPLINARY TEAM HUDDLES, PATIENT ROUNDS AND CARE TEAM MEETINGS, ETC.

- Maintaining situational awareness keeps momentum high, staff engaged and creates opportunities for ongoing education and process improvement.
- Consider the use of visual cues to alert the care team of patients on antibiotics — both unit patient boards and EHR dashboards.
  - Example: Post a magnet or color code the patient assignment board to visually cue the team that a patient is receiving antibiotics.
- Use team safety huddles to review patient status and understanding of escalation plan for care as needed. A concise tool, such as a brief, is recommended.
- Consider reviewing pertinent metrics at leadership safety huddles, such as number of current hospitalized patients with *C. difficile* to promote awareness.
- The Pew Charitable Trust published a review of 10 hospital case studies in ASP implementation that has resources and innovative ideas for further operational integration.

TASK #6: HAVE LABORATORY STAFF REVIEW AVAILABILITY, FEASIBILITY AND RETURN ON INVESTMENT OF ADVANCED TESTING METHODS

- Examples may include (and will expand based upon prevailing technology):
  - rapid viral testing for respiratory pathogens
  - rapid diagnostic testing of blood specimens
- Development of stratified antibiograms.
- Note that use of these or other emerging recommendations and/or those noted to have weak evidence due to lack of study should be developed as part of the ASP team’s oversight. Special attention to prescriber education and ability to interpret results should be implemented.

TASK #7: COMPLETE QUARTERLY PDSA REVIEW OF PROJECT IMPLEMENTATION TO DATE

Return the [PDSA form](#) to your project mentor according to timeline.
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PHASE 1
READINESS

PHASE 2
RECOGNITION

PHASE 3
RESPONSE
RESPONSE PHASE

GOAL
Review the results of the processes or changes that were introduced, assess for process issues and continue auditing for compliance and PDCA next steps.

TASK #1: REVIEW DATA FOR A TREND LINE

- Use a “learning from defects tool” to determine the root cause of any failures in the process improvement plan or interventions.
- Consider the need for ongoing staff and patient education.
- Determine if triggers are working effectively. Consider using the Just Culture algorithm to enhance accountability.
- Perform advanced data analytics for disparities. Identify subsets of patients who are more at risk in your organization/community and what is being done to mitigate those risks.
- Share and post project data to create awareness and urgency to improve. This especially is effective when working to promote practice changes among providers.

TASK #2: REVIEW MANAGEMENT OF SPECIALTY POPULATIONS

- Hematology-Oncology
  - fungal infections
  - fever and neutropenia
- Nursing homes, SNF, swing beds
- NICU and pediatrics
- Immunocomprised and terminally ill

TASK #3: CONTINUE TO “SPOT-CHECK” OBSERVATION-BASED WORKFLOWS THROUGH REAL-TIME AUDITS

- Use of software tools that enable observation-based assessment is recommended.
- Assign responsibility for audit completion with due dates. Regular, consistent review of practices and data is important for rapid process improvement. Use frontline and nonclinical staff to gain new perspectives and engagement.
- Maintain situational awareness by reviewing data and observations in huddles, at staff meetings and during physician meetings. Remember, it is not about blame or pointing out failures; it is about improving patient care and learning how to provide it more efficiently and effectively. This takes ongoing effort and a culture that constantly strives to improve.
**TASK #4: REVIEW WHAT BARRIERS (IF ANY) REMAIN**

- Network with peers in the statewide project group to work through barriers.
- Debrief with the organizational project team to discuss ways to overcome barriers.
- Engage a physician or executive champion for support, guidance, and resources to gain momentum.
- Review the initial approach. Ensure you have a strong case to support the change. Use resources in the toolkit and reference literature to demonstrate evidence-based practice.
- Use collected data to highlight positive and negative trends.
- Spread best practices by engaging post-acute care providers, such as local nursing homes.

**TASK #5: TELL YOUR STORY! (ROI AND PATIENT SAFETY ACHIEVEMENTS)**

- Identify stories of patient care improvements, goal rate achievement, etc., and share those with staff, physicians, executive leadership, board members, and patients and family.
- Identify high-reliability principles used in project implementation and report how these improvements saved resources.
- Identify opportunities to scale and sustain improvements. How could protocols be used in other areas of care to reduce variation?
- Consider how project implementation has led to meeting the Triple Aim.
- Return on investment resources: ASP ROI Excel template
  - Direct attributable financial benefits including the following:
    - reduced antibiotic expense with particular emphasis on broad spectrum antibiotic use through more precise prescribing practices
    - reduced expenses associated with keeping and maintaining antibiotic inventory
    - decreased mortality from *C. difficile* cases and the $10,000 per incidence cost (national average) associated with the diagnosis
  - Indirect financial benefits and value-based reimbursement outcomes include the following.
    - avoided unnecessary admissions
    - decreased readmissions and length of stay
    - decreased risk and rate of hospital-acquired infections
    - improved DRG sufficiency

**TASK #6: COMPLETE QUARTERLY PDSA REVIEW OF PROJECT IMPLEMENTATION TO DATE**

Return the PDSA form to your project mentor according to timeline.
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