

Project Summaries for ACTION III Projects Awarded in 2016

Title	Contractor	Amount	Page
Adapting and Implementing Patient Safety Practices in Ambulatory Care	Health Research & Educational Trust (HRET) of the American Hospital Association	\$565,400	1
Implementation of the TeamSTEPPS Program	HRET	\$3,790,206	4
TeamSTEPPS® for Office-Based Care Online CE/CME	HRET	\$1,373,276	7
AHRQ Safety Program for Improving Antibiotic Use	Johns Hopkins University (JHU)/Armstrong Institute for Patient Safety and Quality (Armstrong Institute)	\$16,220,044	9
Quality Safety Review System Pilot Test in Hospitals	JHU/Armstrong Institute	\$1,348,441	13
Developing Criteria for Assessing Feasibility of Implementing Patient-Centered Outcomes Research (PCOR) Findings	The Lewin Group	\$265,962	16
Quality Safety Review System (QSRS) Pilot Test in Hospitals	MedStar Health Research Institute	\$1,471,484	18
Adapting and Implementing Patient Safety Practices in Ambulatory Care	NORC at the University of Chicago	\$561,874	21
Estimating the Additional Hospital Inpatient Cost and Mortality Associated With Selected Hospital-Acquired Conditions	NORC at the University of Chicago	\$464,967	24
Identifying, Assessing, and Balancing Competing Risks of Multiple Hospital-Acquired Conditions	Regents of the University of Colorado	\$674,416	26
Workflows To Improve Safety and Efficiency in Laboratory Testing (WISE-LT)	Regents of the University of Colorado	\$533,890	29
The Academy for Integrating Behavioral Health and Primary Care	Westat, Inc.	\$1,000,000	32



This page intentionally left blank.

ACTION III Project Summary: Adapting and Implementing Patient Safety Practices in Ambulatory Care

Prime Contractor: Health Research & Educational Trust (HRET) of the American Hospital Association

Subcontractors

- Vidant Health
- University of Washington - Harborview Medical Center
- North Carolina Quality Center
- Institute for Healthcare Improvement
- Institute for Patient and Family-Centered Care
- HCD International

Principal Investigator/Project Lead: Marie Cleary-Fishman

Additional Key Personnel

- Eric Coleman, M.D., M.P.H., Professor of Medicine, Head of the Division of Health Care Policy and Research, Director of the Care Transitions Program at the University of Colorado
- David Andrews, B.A., Patient Advisor at Georgia Hospital Association and Georgia Regents Medical Center
- Helen Haskell, M.A., President of Mothers Against Medical Error and Board Member for the National Patient Safety Foundation, Consumers Advancing Patient Safety, the Institute for Healthcare Improvement, and the International Society of Rapid Response Systems
- Judith Hibbard, Dr.P.H., M.P.H., Professor of Health Policy in the Department of Planning, Public Policy, and Management at the University of Oregon and Clinical Professor in the Department of Public Health and Preventive Medicine at the Oregon Health and Sciences University
- Robb Malone, Pharm.D., Vice President of Practice Quality, Innovation, and Population Health Services at the University of North Carolina
- Terrence O'Malley, M.D., Medical Director for Non-Acute Care Services at Partners HealthCare System
- Gloria Stone Plottel, M.B.A., M.S., Founder and CEO of GSPsquared LLC

Project Period: 9/30/2016–9/29/2017

Total Cost: \$565,400

AHRQ Contact: Ric Ricciardi

Project Type: Pilot Test/Proof of Concept; Product Development

Project Purpose, Goals, and Objectives

The purpose of this project is to develop a toolkit for ambulatory care facilities (ACFs) to help them effectively engage high-risk patients and their families and friends helping with care to transition safely to a new ambulatory-care provider after their visit. The toolkit will include one tool for patients and families and friends and a corresponding tool for staff. The goal is that when ACFs use the toolkit, patients at high risk for adverse events and the families and friends who

assist in their care will leave with the health knowledge, confidence, and motivation they need to transition effectively to another care provider.

Background and Significance

According to the Centers for Disease Control and Prevention, there were approximately 929 million physician office visits in 2012 and 126 million hospital outpatient visits in 2011. In addition, approximately 80 percent of all medical procedures are performed in ACFs. Providers in these facilities often must see many patients in a short time. Therefore, patients and their families may not fully understand what their diagnosis means, how to manage their illness, what to do if symptoms do not improve, when to follow up with their provider or a specialist, and other aspects of their care.

Although patients and their families must be caregivers and advocates, they often lack the requisite skills, knowledge, motivation, and confidence to take on these roles. This toolkit is meant to address this need. While evidence-based patient and family engagement discharge tools are available for acute, inpatient environments, no patient and family engagement tools exist for high-risk patients and their families and friends to help them transition from one ambulatory care setting to another. This project will address that gap.

This project will provide information about the usability and usefulness of the toolkit for patients treated in ambulatory care settings. At the end of the project, AHRQ will make the toolkit available online for those who work at ACFs, their patients, and the family and friends who assist with patient care. Other beneficiaries include staff at other healthcare facilities, because the patients and their family and friends who care for them will be better educated and equipped to handle health conditions and transition to other providers.

Target Audiences

The intended users of the toolkit are staff who work at ACFs, their patients, and the family and friends who assist with patient care.

Methods

The toolkit will be developed primarily from two existing tools: the AHRQ IDEAL Discharge Planning toolkit and the Centers for Medicare & Medicaid Services discharge tool. The contractor will work with subject matter experts to determine which content to include in the toolkit and to identify additional content from other sources.

The contractor will test the usability and usefulness of the toolkit at two pilot sites using the U.S. Government Accountability Office's case study evaluation framework. The pilot sites will:

- Complete a preintervention assessment to determine which parts of the toolkit apply to their facility;
- Review the toolkit guide and narrated PowerPoint videos that explain the toolkit-implementation process;
- Share the patient tool with patients and patients' family and friends; and
- Use the accompanying staff tool.

After 4 months of implementation, the contractor will conduct interviews with the pilot sites about their experiences with the materials and how the materials can be improved. Results will be coded and analyzed. The contractor and subject matter experts will revise the toolkit based on the evaluation.

Project Settings

- Vidant Multispecialty Clinic, located in Belhaven, North Carolina, offers primary care, cardiac consults, and physical therapy.
- Harborview Medical Center is a general internal medicine primary care clinic located in Seattle, Washington.

Key Tasks/ Activities

- Toolkit development. The contractor will develop the following:
 - Appointment aid, a tool for high-risk patients and the families and friends who assist in their care at ACFs who will transition to other ACFs
 - ACF team tool, a corresponding tool for staff
 - A preintervention assessment
 - A toolkit guide
 - Narrated PowerPoint videos to explain how to implement the toolkit
- Site recruitment. The contractor will recruit two primary-care ambulatory facilities, one in an urban setting and one in a rural setting, that will serve as test sites for the toolkit.
- Data collection and analysis. The contractor will collect data from clinic staff on the usability and usefulness of the toolkit and will then analyze the results.
- Toolkit revision. The contractor will revise the tools based on findings from pilot testing.
- Dissemination. The revised toolkit will be ready for posting on the AHRQ website.

Expected Deliverables

- Toolkit
- Final case study
- Final project report

ACTION III Project Summary: Implementation of the TeamSTEPPS Program

Prime Contractor: Health Research & Educational Trust

PI and Project Director: Barbara Edson, RN, M.B.A., M.H.A., and Christopher Hund, M.F.A.

Key Personnel and Subcontractors

- IMPAQ International
- Northwell Health
- Duke University
- The MetroHealth System
- University of Minnesota
- Tulane Center for Advanced Medical Simulation and Team Training
- University of Washington
- University of California, Los Angeles (UCLA)

Project Period, Including Options: 9/30/2016-9/29/2018

Total Cost, Including Options: \$3,790,206

AHRQ Contact: Barbara Bartman

Project Type: Dissemination and Implementation

Project Purpose, Goals and Objectives

The purpose of this task order is to continue the deployment and implementation of the TeamSTEPPS program to reduce adverse outcomes connected to poor communication, by:

- Supporting the adoption and use of the program by health systems, healthcare provider institutions, health professionals, and educational institutions nationwide;
- Developing and pilot testing new TeamSTEPPS curricula and training to support quality improvement integration; and
- Assessing what occurred 6 months after the trainees returned to their home institutions.

Background and Significance

Poor communication and lack of teamwork have been linked to adverse outcomes, medical errors, and overall lower quality of care. TeamSTEPPS is an evidence-based program developed jointly by the Department of Defense and AHRQ to improve care coordination, handoffs, communication, and teamwork. TeamSTEPPS is composed of a training curriculum and toolkit and works by training “Master Trainers” from diverse provider settings who are then expected to train individual health professionals at their home institutions.

TeamSTEPPS curriculums were developed for healthcare team members from hospitals initially, followed by the development of specialty courses for long-term care facilities, dental or oral care offices, and office-based care environments. Training resources to support improved care coordination for patients with limited English proficiency are also available.

National implementation of this evidence-based program was launched in 2007 and continues today:

- Since 2012, approximately 5,000 healthcare professionals across the country have been trained in the Master Trainer Course, the Advanced Master Trainer Course, or one of the Specialty Courses.
- These individuals represented different disciplines, including nurses, physicians, pharmacists, administrators, and educators from hospitals of all sizes, healthcare systems, Quality Improvement Organizations, and academic medical centers. All regions and States in the country were represented, as well as rural and urban areas.
- Approximately 1,000 individuals are expected to be trained with this task order if all the options are exercised.

Target Audiences

The target audience for the TeamSTEPPS project includes:

- All types of clinicians and healthcare professionals from all types of healthcare delivery organizations;
- Health professions students, both at the graduate and undergraduate levels; and
- Nonclinical staff at healthcare-related organizations (e.g., staff from administrative, security, and environmental services).

Methods

TeamSTEPPS relies on a regional training center model for both the standard and advanced trainings. The seven TeamSTEPPS regional training centers are hospitals that have been shown to be adept at both using the fundamentals of TeamSTEPPS and teaching others how to implement TeamSTEPPS in their unique environments. After attending in-person training, trainees receive additional support through monthly webinars, a yearly national conference, and access to regularly updated, web-based educational resources and materials.

The effectiveness of the Basic and Advanced trainings will be evaluated using Kirkpatrick's Evaluation Strategies, which use a phased approach to measure "Reaction, Behavior, and Result." A course-evaluation form will be used to assess how people felt about the course immediately upon completion. A posttraining survey that goes to all attendees 6 months later will attempt to ascertain what happened after the attendees returned to work. In addition, case studies will be undertaken to more closely examine activity at a more limited number of sites illustrating best practices.

Project Settings

Regional training centers are located in North Carolina, Ohio, New York, California, Minnesota, and Washington.

Key Tasks/Activities

- Provide TeamSTEPPS Master Training courses, onboarding webinars, discussion forums, and a dedicated helpline and email inbox. Individuals receive Continuing Medical Education or Continuing Education Units for attending these courses.
- Provide Advanced TeamSTEPPS courses for existing TeamSTEPPS users on how to better integrate, spread, and sustain TeamSTEPPS principles and activities with existing quality and safety improvement activities.
- Maintain an AHRQ-hosted, web-based user support network, which will include monthly webinars.
- Execute an evaluation plan to measure the effectiveness of the Master Training course.
- Host an annual national conference.

Deliverables

- Regional Training Resource Centers Capability Report
- TeamSTEPPS® Faculty Capability Report
- Operational Plan for Training Delivery
- Technical Assistance and User Support Plan
- Final Report: Technical Assistance Activities
- Evaluation Plan
- Evaluation Report
- Conference Plan and Agenda
- Final Report: National Conference

ACTION III Project Summary: TeamSTEPPS® for Office-Based Care Online CE/CME

Prime Contractor: Health Research and Educational Trust

Principal Investigator: Barbara Edson, RN, M.B.A., M.H.A.

Project Director: Christopher Hund, M.F.A.

Key Personnel and Subcontractors

- IMPAQ International: David Baker, Ph.D.; Andrea Amodeo, M.S.
- Reingold: Brigetta Craft, D.N.P.; Jeff Kelly, M.A.; Doug Gardner, M.B.A.

Project Period: 9/30/16-12/31/19

Total Cost: \$1,373,276

AHRQ Contact: Priscilla Novak

Project Type: Pilot Test/Proof of Concept; Product Development; Implementation; Broad-Based Spread

Project Purpose, Goals, and Objectives

The purpose of this project is to create and disseminate an online version of the TeamSTEPPS for Office-Based Care Course that is accredited for both Continuing Medical Education and Continuing Education Units. TeamSTEPPS is an evidence-based program designed to improve patient safety and provider productivity through improved communication and teamwork. Under this project, a minimum of 1,000 staff from medical offices will be expected to take the online course and translate the training they receive into improvements in how care is delivered within their office settings.

Background and Significance

Poor communication and lack of teamwork have been linked to adverse outcomes, medical errors, and overall lower quality of care. TeamSTEPPS is an evidence-based program developed jointly by the Department of Defense and AHRQ to improve care coordination, handoffs, communication, and teamwork. In the increasingly complex healthcare delivery landscape, TeamSTEPPS also has the potential to increase staff productivity, which can increase patient satisfaction. TeamSTEPPS is composed of a training curriculum and toolkit and works by training “Master Trainers” who are then expected to train individual health professionals at their home institutions.

While TeamSTEPPS was initially developed for use in hospitals, it was subsequently adapted for other settings, including medical offices. This expansion has been particularly important as new productivity models are pushing more aspects of care out of hospitals into ambulatory environments. In addition, medical offices are being increasingly integrated into complex health systems, requiring even more coordination and communication within and across specific care sites.

An initial TeamSTEPPS master trainer course for the medical office targeted “practice facilitators” (in-house quality improvement experts with both clinical and nonclinical backgrounds) using a hybrid approach that combined in-person and online training. Now, in an effort to further expand the potential for increased implementation across medical offices, a

revised, online-only version of TeamSTEPPS for Office-Based Care is being developed for physicians, physician assistants, nurse practitioners, nurses, and nonclinical professionals. The online tool is expected to greatly increase the audience for the trainings and broaden the knowledge within medical office settings of how to translate the training into improvements in care delivery.

Target Audiences

The target audience for this project is anyone who works to improve care quality within a medical office, including, for example, physicians, physician assistants, nurse practitioners, nurses, and nonclinical professionals. In addition, the online training may be of interest to individuals from quality improvement organizations, professional associations, and educational entities.

Methods

- The Learning Management System (LMS) will be customized and updated to support an online-only audience while ensuring that all pertinent safety, security, and privacy issues are addressed.
- Attendee recruitment will be achieved using AHRQ communication channels, including the TeamSTEPPS ListServ and the Patient Safety ListServ, and direct outreach to health systems will be used to recruit attendees.
- An email helpline, one on one coaching with teach-back by instructors, and webinars will be used to provide technical assistance and user support.
- The Kirkpatrick framework will be used to assess participant satisfaction with the course and changes in participant knowledge, attitudes, and behaviors. Surveys will be disseminated via the LMS and through email.

Key Tasks/ Activities

- Update TS for Office-Based Care materials so they are appropriate for an online-only audience.
- Adapt the existing LMS and use it to host the training.
- Train a minimum of 1,000 individuals.
- Work with a Continuing Medical Education/Continuing Education Unit provider to accredit the course.
- Recruit cohorts.
- Provide user support.
- Evaluate the program.

Expected Deliverables

- Implementation Plan
- CE/CME/CEU certificates
- Revised TS for Office-Based Care Online materials
- Teach-back certifications
- Survey Instrument
- Report of Survey Results
- Webinars

ACTION III Project Summary: AHRQ Safety Program for Improving Antibiotic Use

Prime Contractor: Johns Hopkins University/Armstrong Institute for Patient Safety and Quality

Principal Investigator: Sara Cosgrove, M.D., M.S.

Additional Key Personnel and Subcontractors

- Johns Hopkins University
 - Pranita Tamma, M.D., M.H.S. (Co-PI)
 - David Thompson, D.N.Sc., M.S., RN
 - Lisa Lubomski, Ph.D.
- NORC at Chicago University
 - Prashila Dullabh, M.D. (Co-Investigator)
 - Roy Ahn, Sc.D. (Co-Investigator)
- Louis Stokes Cleveland Veterans Affairs Medical Center
 - Robin Jump, M.D., Ph.D. (Co-Investigator)
- Brigham and Women's Primary Care Practice-Based Research Network
 - Jeffrey Linder, M.D., M.P.H. (Co-Investigator)
- Geisinger Health System
 - Stanley Martin, M.D.
- Carolinas HealthCare System
 - Lisa Davidson, M.D.

Project Period: 9/2/2016-9/1/2021

Total Cost: \$16,220,044

AHRQ Contact: Melissa Miller

Project Type: Pilot Test/Proof of Concept; Product Development; Dissemination and Implementation

Project Purpose, Goals, and Objectives

- Identify best practices in the delivery of antibiotic stewardship in acute care, long-term care, and ambulatory care settings.
- Determine how to best adapt the current Comprehensive Unit-Based Safety Program (CUSP) model to enhance antibiotic stewardship efforts in healthcare settings.
- Implement a bundle of technical and adaptive interventions designed to increase the uptake of antibiotic stewardship across multiple institutions and practices.

Background and Significance

Antibiotics are one of the greatest medical developments of the 20th century, yet when they are not used appropriately they can have serious adverse effects. These adverse effects can include, for example, *Clostridium difficile* infections (CDIs), organ dysfunction, allergic reactions, and development of antibiotic resistance on both a patient level and population level. To limit the adverse effects associated with inappropriate use of antibiotics, healthcare providers are

encouraged to implement antibiotic stewardship (AS) programs, coordinated efforts to improve the use of antibiotics by promoting the selection of the optimal antibiotic regimen, dose, duration of therapy, and route of administration.

Thus far, AS efforts have mainly targeted acute care settings. To support such efforts, the Centers for Disease Control and Prevention (CDC) has produced a document titled *Core Elements of Hospital AS Programs*. Yet significant work remains in the inpatient arena. A 2014 survey conducted through the National Healthcare Safety Network of 4,184 U.S. acute care hospitals indicated that only 39 percent had implemented all seven core elements of hospital AS programs, as defined by the CDC document. In addition, it has been recognized that to achieve the goals of AS on a broad scale, efforts must span the continuum of healthcare settings, including long-term care (LTC) and outpatient settings.

More than half of all residents of LTC facilities receive antibiotics each year, with approximately 75 percent of antibiotic use considered to be inappropriate. More than 60 percent of antibiotic expenditures occur in the ambulatory setting, and at least 30 percent of antibiotics started in outpatients are unnecessary, making it a critical target for AS.

AHRQ has funded this project to promote and support widespread uptake of AS across inpatient, outpatient, and LTC settings nationwide. To achieve this goal, the project team will adapt and apply the CUSP model to address AS. CUSP combines improvements in safety culture, teamwork, and communication with evidence-based interventions. CUSP has been successfully adapted and implemented under a series of past ACTION I and II projects to reduce diverse hospital-acquired infections.

Target Audiences

Our primary target audience consists of individuals involved in the prescribing process or in direct patient care, including:

- Acute care sites: physicians, pharmacists, nurses, nurse practitioners, and physician assistants.
- LTC sites: physicians, pharmacists, nurses, nurse practitioners and physician assistants, and certified nurse assistants or licensed practical nurses.
- Ambulatory care sites: physicians, pharmacists, nurses, nurse practitioners, and physician assistants.

The ultimate beneficiaries of this project are the patients or residents of care facilities that adopt effective AS programs.

Methods

The project team will perform an evidence review to ascertain the interventions that have been attempted and effective in improving AS in different settings. The scan will assess:

- Necessary personnel for a successful AS program;
- Particular implementation approaches that have led to successful AS adoption, including those that have assessed behavioral factors associated with improved uptake of AS;

- Targets for AS; and
- Process and outcome measures that have been adopted to measure the success of the interventions.

The team will then develop a CUSP for Antibiotic Stewardship Customizable Educational Kit tailored for acute care, LTC, and ambulatory care facilities. (Education kits that allow local customization greatly facilitate uptake of interventions as they allow local teams to feel greater ownership.)

The kit will include training modules and additional tools that facilitate effective antibiotic stewardship, such as:

- Adaptable guidelines for common infections,
- Antibiotic timeout tools,
- Checklists,
- Daily goals,
- Guides for performing mini-root cause analyses for cases of CDI and other adverse outcomes,
- Tools to assess appropriateness of prescribing, and
- Examples of data reporting).

Educational tools will be developed by subject matter experts, with input from a Technical Expert Panel (TEP).

Implementation and Testing

Implementation and testing of the AS materials will occur across four cohorts, each lasting a year.

- The first cohort will be a set of sites associated with *three integrated healthcare delivery systems* and will include at least 2 acute care, 2 LTC, and 2 ambulatory care sites enrolled from each system, with at least 10 sites per IDS, total.
- Participating teams will be expected to:
 - Develop or maintain an AS team,
 - Incorporate the principles of CUSP into their work,
 - View the eLearning modules prior to the associated content webinar,
 - Implement the interventions into their practice,
 - Facilitate data collection (rates),
 - Participate in adjudication of antibiotic appropriateness and enter the data into the project data portal,
 - Participate in the appropriate Survey on Patient Safety Culture for their setting (hospital, nursing home, or medical office), and
 - Participate in other project assessments as requested.

Sites are also expected to develop a sustainability program based on information relayed in modules and webinars. Based on results of the pilot test, both in rate of antibiotic use reductions and in feedback on the program, we will redesign the curriculum focusing on AS in the acute care setting.

- Cohorts 2-4 will include hospitals, LTCs, and ambulatory care facilities that will be recruited by coordinating entities composed of Quality Improvement Network/Quality Improvement Organizations, Hospital Improvement and Innovation Networks, State hospital associations, and other entities. Participating teams at each recruited site of care will be expected to meet the requirements and participate in the activities described above for the integrated delivery systems.

Data Collection and Analysis

Each cohort will have 3 months of baseline data collection and 9 months of data collection during the intervention period. Rate-based data can be pulled from site electronic health records, and we will work with personnel at the sites to help them facilitate their data pulls. Data on appropriateness of use will be hand entered into the data portal on the project website.

The project will use a pre-post evaluation design, comparing data from each participating site preintervention and postintervention. Changes of both process measures (structural assessment) and outcome measures (patient safety culture surveys) from baseline to postintervention will be analyzed, as will the effects of other factors on those changes. Interrupted time series design and analysis will be used to investigate the changes in antibiotic use and clinical outcomes over time and the impact of the AHRQ Safety Program.

Project Settings

The pilot cohort sites include Johns Hopkins Health System, Carolinas HealthCare System, and Geisinger Health System. Over the course of the project in subsequent cohorts, 250 to 500 sites will be recruited from each setting: acute care hospitals, LTC facilities, and ambulatory care settings.

Key Tasks/Activities

- Conduct an environmental scan.
- Hold TEP meetings.
- Develop tools and educational materials.
- Recruit sites.
- Implement AS program at each site.
- Collect and analyze data.
- Produce reports.

Expected Deliverables

- Report of Evidence Review
- Course Design Guide
- Prototype Materials
- Integrated Systems Recruitment Plan
- Operating Plan
- Sustainability Plan
- Stakeholder Meeting and Meeting Report
- Train-the-Trainer Meeting and Meeting Report
- Data Collection and Analysis Plan
- Implementation of CUSP for Antibiotic Stewardship in Recruited Sites

ACTION III Project Summary: Quality Safety Review System Pilot Test in Hospitals

Prime Contractor: Johns Hopkins University (JHU), Armstrong Institute for Patient Safety and Quality

Principal Investigator: Bradford Winters, Ph.D., M.D.

Co-Investigators: Michael Rosen, Ph.D.; and John Matthew Austin, Ph.D.

Additional Key Personnel: Chris Halligan, JHU; and Erin Kirley, JHU

Project Period: 9/29/2016–1/18/2018

Total Cost: \$1,348,441

AHRQ Contact: Tahleah Chappel, M.S.

Project Type: Pilot Test

Project Purpose and Objectives

The purposes of this task order are to assess the clinical accuracy, efficiency, comprehensiveness, and usability of the Quality Safety Review System (QSRS) in identifying adverse events documented in hospital medical records across diverse health systems and to identify possible changes to improve system performance. The objectives of the project are:

- Test the standardized definitions, algorithms, and ability to generate reports.
- Assess the sensitivity and comprehensiveness of QSRs in identifying all adverse events recorded in medical records, through a peer review process.
- Evaluate the usability of the QSRs and reports through documentation of unclear questions, availability of help text, comparison of abstraction time, and ability to support peer review and quality/safety improvement within hospitals.

Background and Significance

In coordination with the Department of Health and Human Services, AHRQ has developed the QSRs to replace the Medicare Patient Safety Monitoring System, which is currently used for surveillance and benchmarking of adverse patient safety events (falls, medication events, wrong site surgeries, etc.).

QSRS is designed to:

- Allow collection of comparable performance data over time and across settings using standard definitions and algorithms to identify events;
- Generate adverse event rates;
- Trend performance over time; and
- Benchmark performance across institutions.

For the most frequently occurring events, QSRs provides additional detail beyond the fact that the event occurred. For example, QSRs will show not just fall rates in a specific hospital over a given time, but also the percentage of falls that resulted in injury and the percentage of each specific type of injury. The standardized definitions and algorithms allow users to measure *all*

cause harm, and the standard specifications ensure that an event identified at one institution (or one department of a hospital) is the same as one identified elsewhere.

The current specifications for QSRS are for a manual system. However, as electronic health records (EHRs) evolve, QSRS is expected to increasingly be automated to further decrease time needed to identify adverse events. AHRQ envisions a stepwise development process for QSRS to reach a future, more automated patient safety surveillance system seamlessly integrated into EHRs.

This project represents the first step in this process, which is to conduct demonstrations “in the field” using human abstractors, in order to test the standardized definitions and algorithms and the generation of reports to optimize their validity and precision. Use of human abstractors and thorough testing with hospitals that use a variety of EHRs is essential for developing a surveillance system that can be implemented in any hospital.

Feedback from hospital testing will provide AHRQ with information on accuracy and efficiency of the system, as well as about the local value of the surveillance data and feedback on how these data can be acted on at the hospital level to prevent adverse events. The personnel involved in the care of patients whose medical records are reviewed will be available to validate results of QSRS review and will be able to suggest changes to improve its ability to meet its objectives.

Target Audiences

The preliminary target audience for the findings from this research project is AHRQ, which will use what is learned to refine and improve the QSRS. The audience for the QSRS is any individual, department, or committee with an interest in data about the occurrence of adverse events within a hospital, for the purpose of improving healthcare safety and reducing harm to patients in the hospital environment.

Methods

The project team and local project managers will select and review a random sample of at least 2,400 medical records from a retrospective 6-month period (January 1, 2016, through June 30, 2016) from each of four to six participating hospitals (see “Project Settings” below for the list of hospitals). In addition to the 2,400 total general review charts, we will select and review 300 “enriched” records from patients with a length of stay greater than 3 days from across the six participating hospitals.

The coders will be trained on the QSRS and will then review the random sample and enriched records. Duplicate reviews will be performed on a subset of 100 records per facility to determine interrater reliability and for peer review panels to examine the clinical validity of the QSRS reports. Peer review panels will review the results of the coders’ abstractions against the actual EHR charts for clinical accuracy of the coding relative to the clinical record.

The data that are collected will be analyzed for true positive and false positive adverse events. Abstractors will be asked for their recommendations for improving the QSRS. Finally, the project team will apply a usability framework to evaluate the QSRS and associated training materials, including an assessment of learnability, efficiency, memorability, errors, and satisfaction.

Project Settings (Base Year)

- Johns Hopkins Bayview Medical Center, Baltimore, MD
- Johns Hopkins All Children's Hospital, St. Petersburg, FL
- Walter Reed National Military Medical Center, Bethesda, MD
- Brooke Army Medical Center, San Antonio, TX
- The Queen's Medical Center, Honolulu, HI
- Allegheny General Hospital, Pittsburgh, PA

Key Tasks

- Test the clinical accuracy of the QSRs software.
- Prepare and evaluate population reports and case summaries.
- Evaluate the usability of the QSRs software.

Key Deliverables

- Work Plan
- Final Report

ACTION III Project Summary: Developing Criteria for Assessing Feasibility of Implementing Patient-Centered Outcomes Research (PCOR) Findings

Prime Contractor: The Lewin Group

Project Director: Anjali Jain, M.D.

Project Manager: Christine Jones, M.S., M.P.H., PMP

Additional Key Personnel (Lewin Group): Melanie Wasserman, Ph.D.; Erika Beam, M.S.; and Erin Gardner, B.S.

Project Period: 8/15/2016–2/14/2017

Cost: \$265,962

AHRQ Contact: Parivash Nourjah, Ph.D.

Project Type: Pilot Test/Proof of Concept; Product Development

Project Purpose, Goals, and Objectives

The purpose of this project is to develop and pilot an evaluation system, encompassing a rigorous and efficient set of criteria, with which AHRQ can identify patient-centered outcomes research (PCOR) findings that are most feasible to implement in a wide variety of clinical settings. This tool will be used by leaders at AHRQ to make future funding decisions for PCOR dissemination projects.

Background and Significance

An increasing amount of research is being conducted to identify interventions that improve patient-centered outcomes. However, to affect the patients for which they are intended, effective interventions have to be disseminated and implemented. The Affordable Care Act entrusted AHRQ to disseminate and implement PCOR findings.

AHRQ, in its effort to identify and support the most important PCOR interventions, is collecting public nominations of PCOR interventions and their findings for dissemination and implementation efforts, focusing on findings that:

1. Are supported by the strongest evidence base;
2. Have the greatest opportunity to benefit individuals, communities, and the broader public; and
3. Are most feasible to implement broadly, across a wide variety of clinical settings.

This project will help AHRQ develop a systematic, evidence-based approach to determining which PCOR findings have the highest likelihood of successful dissemination and implementation (#3 above). The intended output from this project is an operational evaluation system, encompassing evidence-based criteria, that will be used to determine which PCOR findings are the most feasible to implement and are therefore the most likely to be successful.

Target Audiences

The target audiences for this project are AHRQ staff and leaders. The ultimate beneficiaries of the evaluation system will be the beneficiaries of PCOR findings in which AHRQ invests. These beneficiaries include patients and their families and caregivers. Additional beneficiaries include

researchers, practitioners, and other stakeholders interested in disseminating and implementing specific PCOR findings who can more effectively demonstrate their likelihood of success by showing they fulfill the identified criteria.

Methods

Lewin will conduct a literature review and key informant interviews and will convene a Technical Expert Panel (TEP) to develop a set of criteria for assessing the feasibility of implementing PCOR findings in practice. Lewin will develop an operational evaluation system that encompasses the criteria and will then pilot-test the evaluation system to verify the tool's content and usability.

Project Settings

Project work will be conducted at the Lewin Group offices in Falls Church, Virginia.

Key Tasks/Activities

A literature review will be conducted to identify criteria used in evaluating the dissemination and implementation of PCOR findings and barriers or facilitators to implementation. Key informant interviews will be conducted to elicit factors influential in implementing research in practice. A TEP meeting will be held for participants to:

- Share ideas and experiences,
- Respond to findings from the literature review and key informant interviews, and
- Elicit additional information on the domains of the criteria and their relative importance in determining feasibility of implementation.

TEP participants will also discuss various scoring systems that could be used to evaluate nominated interventions.

After synthesizing and analyzing the information from these three activities, Lewin will develop a set of feasibility criteria and create an evaluation system. The evaluation system will be pilot tested by members of the project team, key informants and TEP members, and AHRQ staff and will be refined as needed.

Expected Deliverables

- Final Work Plan
- Final Literature Review and Analysis Report
- Final Key Informant Interview Report
- Final TEP Meeting Summary
- Final Feasibility Criteria
- Final Feasibility Assessment Template
- Final Pilot Testing of Feasibility Assessment Template
- Final Summative Report

ACTION III Project Summary: Quality Safety Review System (QSRS) Pilot Test in Hospitals

Prime Contractor: MedStar Health Research Institute

Project Lead: Kathryn M. Kellogg, M.D., M.P.H.

Project Director: Raj Ratwani, Ph.D.

Key Personnel and Subcontractors

- MedStar
 - Rollin J. (Terry) Fairbanks, M.D., M.S.
 - Allan Fong, M.S.
 - Katie Adams
 - Amy Will

- Lexicode

Project Period: 9/29/2016-9/28/2020

Total Cost: \$1,471,484

AHRQ Contact: Tahleah Chappell, M.S.

Project Type: Pilot Test

Project Purpose and Objectives

The purposes of this task order are to assess the clinical accuracy, efficiency, comprehensiveness, and usability of the Quality Safety Review System (QSRS) in identifying adverse events documented in hospital medical records across diverse health systems and to identify possible changes to improve system performance.

The objectives of the project are:

- Test the standardized definitions, algorithms, and ability to generate reports.
- Assess the sensitivity and comprehensiveness of the QSRS in identifying all adverse events recorded in medical records, through a peer review process.
- Evaluate the usability of the QSRS and reports through documentation of unclear questions, availability of help text, comparison of abstraction time, and ability to support peer review and quality/safety improvement within hospitals.

Background and Significance

In coordination with the Department of Health and Human Services, AHRQ has developed the QSRS to replace the Medicare Patient Safety Monitoring System, which is currently used for surveillance and benchmarking of adverse patient safety events (falls, medication events, wrong site surgeries etc.).

QSRS is designed to:

- Allow collection of comparable performance data over time and across settings using standard definitions and algorithms to identify events;

- Generate adverse event rates;
- Trend performance over time; and
- Benchmark performance across institutions.

For the most frequently occurring events, QSRS provides additional detail beyond the fact that the event occurred. For example, QSRS will show not just fall rates in a specific hospital over a given time, but also the percentage of falls that resulted in injury and the percentage of each specific type of injury. The standardized definitions and algorithms allow users to measure *all cause* harm, and the standard specifications ensure that an event identified at one institution (or one department of a hospital) is the same as one identified elsewhere.

The current specifications for QSRS are for a manual system. However, as electronic health records (EHRs) evolve, QSRS is expected to increasingly be automated to further decrease time needed to identify adverse events. AHRQ envisions a stepwise development process for QSRS to reach a future, more automated patient safety surveillance system seamlessly integrated into EHRs.

This project represents the first step in this process, which is to conduct demonstrations “in the field” using human abstractors, in order to test the standardized definitions and algorithms and the generation of reports to optimize their validity and precision. Use of human abstractors and thorough testing with hospitals that use a variety of EHRs is essential for developing a surveillance system that can be implemented in any hospital.

Feedback from hospital testing will provide AHRQ with information on accuracy and efficiency of the system, as well as about the local value of the surveillance data and feedback on how these data can be acted on at the hospital level to prevent adverse events. The personnel involved in the care of patients whose medical records are reviewed will be available to validate results of QSRS review and will be able to suggest changes to improve its ability to meet its objectives.

Target Audiences

The preliminary target audience for the findings from this research project is AHRQ, which will use what is learned to refine and improve the QSRS. The audience for the QSRS is any individual, department, or committee with an interest in data about the occurrence of adverse events within a hospital, for the purpose of improving healthcare safety and reducing harm to patients in the hospital environment.

Methods

A randomly selected sample of 4,700 patient records will be selected from across four MedStar Health hospitals (see “Project Settings” below for the list of participating hospitals). Eight certified medical coders will abstract these patient records using the QSRS to determine if an adverse event occurred during the patient’s hospital encounter. Four hundred records will be dually abstracted by unique coders for interrater reliability. A Clinical Expert Panel will conduct an independent chart review to identify and validate QSRS output. A heuristic evaluation and usability evaluation of the QSRS and output reports will be conducted by usability experts who are part of the National Center for Human Factors in Healthcare.

Project Settings

- MedStar Georgetown University Hospital, Washington, DC
- MedStar Washington Hospital Center, Washington, DC
- MedStar Good Samaritan Hospital, Baltimore, MD
- MedStar Harbor Hospital, Baltimore, MD

Key Tasks:

- Test the clinical accuracy of the QSRS software.
- Prepare and evaluate population reports and case summaries.
- Evaluate the usability of the QSRS software.

Key Deliverables

- Final Report

ACTION III Project Summary: Adapting and Implementing Patient Safety Practices in Ambulatory Care

Prime Contractor: NORC at the University of Chicago

Project Director: Prashila Dullabh

Principal Investigator: Richard Shiffman

Key Personnel and Subcontractors

- NORC: Maysoun Freij, Katherine Donaldson
- Yale School of Medicine: Nitu Kashyap, Raj Brar

Project Period: 10/1/2016–9/30/2017

Total Cost: \$561,874

AHRQ Contact: Ric Ricciardi

Project Type: Pilot Test/Proof of Concept; Product Development

Project Purpose and Goals

The purpose of this project is to reduce the potential for diagnostic errors through the use of health information technology (IT)-enabled clinical decision support (CDS) for community-acquired pneumonia (CAP). Under this project, the contractor will develop and test an electronic health record (EHR)-supported CDS tool for CAP (called CAPPS-CDS) that will assist providers at this sensitive decision-making point.

CAPPS-CDS will be designed to help determine the level of severity and offer guidelines on the appropriate site of care. It will be based on a validated tool recommended by the Infectious Disease Society of American and the American Thoracic Society: the CURB-65.¹

Background and Significance

CAP is a highly prevalent and sometimes catastrophic condition. It is the eighth leading cause of death in the United States.² Approximately 6 million cases are reported annually, resulting in an estimated 4.2 million ambulatory care visits.³ Adults age 65 and older have four times the incidence of CAP as other age groups; they also have higher rates of hospitalization and are more likely to die from CAP.⁴

Failure to properly diagnose this condition can result in serious consequences, such as negative health outcomes, psychological stress, financial loss, and even death. Diagnostic error involving CAP is an understudied issue, especially in ambulatory care settings.^{5,6}

Emergency departments and primary care practices serve as critical decision-making points for patients who present with symptoms of CAP. Based on an assessment of severity of CAP, ambulatory providers must make immediate and critical decisions about the site in which the patient will receive subsequent care. Sites include the hospital—intensive care unit (ICU) or general ward—or the home.

This proof of concept project is the first step in developing a tool designed to assist providers in their decision making at a critical stage in the diagnostic process for patients who present with CAP symptoms. Pilot testing of the tool will provide information about provider experiences with, and perceptions of, the tool. Resulting findings, lessons learned, and recommendations for potential outcome measures for future studies will inform future research in this area.

Target Audiences

The project is aimed at ambulatory care settings, including primary care and emergency department practices. It will target providers, administrators, medical directors, and technologists in these settings who are interested in implementing diagnostic decision support tools in EHRs.

Methods

CDS Design and Implementation

- The CURB-65 tool will be adapted to be a CDS tool in an EHR. The contractor will use semistructured discussions with providers to identify provider preferences and ensure a design that is responsive to provider preferences and workflow.
- The CDS will be implemented in two ambulatory care settings in the Yale New Haven Health system: an emergency department and a mid-sized primary care practice.

CDS Evaluation

- The contractor will undertake a mixed-method evaluation that will include site visits and analysis of quantitative data to gauge the use of the CDS tool. The evaluation will address six research domains: training, technical implementation, workflow, provider perspectives on the CDS, identification of outcome measures, and replicability.
- Qualitative interviews with key stakeholders will be conducted approximately 9 months after the contract start date at both pilot sites. Physician champions, providers, and other staff at each site will participate in qualitative interviews.
- EHR data will be analyzed to assess the number of times the CDS tool was initiated, number of times the tool was used to completion, and number of patients diagnosed with CAP in the clinic that month.

Project Settings

The CDS tool will be pilot tested in two settings that will share EHR usage data with respect to the CDS tool: Bridgeport Emergency Department (Bridgeport, CT) and PriMed Stratford (Stratford, CT).

Key Tasks/Activities

- Select patient safety tool: Analyze CAP diagnostic tools, settings of use, specificity and sensitivity of the tool, and feasibility of implementation to identify the optimum tool for adaptation into an EHR CDS intervention.
- Develop CDS tool: Adapt the CURB-65 tool to CDS, consider design options and tradeoffs, and develop the tool in Yale's EHR.

- Gather input concerning toolkit and CDS requirements from pilot sites: Observe and interview physician champions at the test sites to determine how the CDS tool will fit into clinicians' workflows and how to best prepare users to adopt the tool.
- Create CDS implementation toolkit: Develop a toolkit that will accompany the CDS tool to facilitate adoption and implementation at pilot sites. This toolkit will provide training on the CDS tool and a rationale for its use.
- Train clinicians: Assist with training clinicians at each pilot site who will use the tool.
- Pilot implementation in ambulatory practices: Implement the CDS tool in practices at two pilot sites for 5 months.
- Develop and conduct evaluation: Develop a mixed-methods evaluation plan of usability and usage of the CDS tool. Use qualitative interviews with key informants at each test site to assess provider experiences with the CDS tool, provider perceptions on the utility of the tool, and integration into provider workflow. Collect EHR usage data to gauge frequency of use.
- Develop case study report: Develop a comprehensive case study report on our evaluation of the CDS tool that will present lessons learned and recommendations for potential future studies and the outcome measures they might use.

Deliverables

- Final toolkit
- Evaluation plan
- Case study report

-
1. Mandell L, Wunderink R, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* 2007;44:S27-S72. <http://www.thoracic.org/statements/resources/mtpi/idsaats-cap.pdf>. Accessed January 24, 2018.
 2. Kochanek KD, Murphy SL, Xu JQ, et al. Deaths: final data for 2014. *Natl Vital Stat Rep* 2016 Jun;65(4):1-122. http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf. Accessed January 24, 2018.
 3. Watkins RR, Lemonovich TL. Diagnosis and management of community-acquired pneumonia in adults. *Am Fam Physician* 2011;83(11):1299-1306. <https://www.aafp.org/afp/2011/0601/p1299.html>. Accessed January 24, 2018.
 4. Stupka J, Mortensen E, Anzueto A, et al. Community-acquired pneumonia in elderly patients. *Aging Health* 2009;5(6):763-74. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2917114/>. Accessed January 24, 2018.
 5. Singh H. Diagnostic errors: a new chapter in patient safety science, policy, and practice. Patient Safety Network Perspectives on Safety. Rockville, MD: Agency for Healthcare Research and Quality; January 2016. <https://psnet.ahrq.gov/perspectives/perspective/188/diagnostic-errors-a-new-chapter-in-patient-safetyscience-policy-and-practice>. Accessed January 24, 2018.
 6. Newman-Toker DE, Pronovost PJ. Diagnostic errors—the next frontier for patient safety. *JAMA* 2009;301(10):1060-2. <https://www.ncbi.nlm.nih.gov/pubmed/19278949>. Accessed January 24, 2018.

ACTION III Project Summary: Estimating the Additional Hospital Inpatient Cost and Mortality Associated With Selected Hospital-Acquired Conditions

Prime Contractor: NORC at the University of Chicago

Principal Investigator: Dr. David Murphy, Emory University

Project Director: Alison Laffan, Ph.D., NORC at the University of Chicago

Project Period: 9/30/16–3/29/17

Total Cost: \$464,967

AHRQ Contact: Minet Javellana

Project Type: Research

Project Purpose, Goals, and Objectives

The goal of this project is to provide updated incremental cost estimates and additional or attributable mortality estimates for 10 specified hospital-acquired conditions (HACs). This project will reexamine the available literature with the intention of addressing noted limitations of current methods for estimating incremental costs and effects of HACs.

Background and Significance

In 2014, AHRQ estimated that about 170,000 people died in 2014 as a result of an adverse event or medical error. Of these, we estimate that about 44 percent—approximately 75,000—were preventable.¹ While significant progress has been made in decreasing the incidence of HACs, these conditions continue to have a high financial and human burden on the U.S. healthcare system.

Interventions to reduce HACs have been an important undertaking for the Department of Health and Human Services (HHS), and AHRQ-supported efforts to quantify the impact on cost and mortality of HAC reduction efforts have been an important part of this effort. While there is broad consensus on the importance of accurately measuring the incidence and impact of HACs, recent studies have raised concerns about the validity and relevance of current approaches to doing so. In addition, the recent transition to data collection and reporting via the Quality and Safety Review System has brought a change in metrics, making this a critical time to update the existing methodology.

Updated cost and mortality estimates will help AHRQ and policymakers better understand the scope of the problem of HACs and better assess the impact of interventions designed to reduce HACs. In addition, this work can help improve understanding of the role that such measures play in improving patient safety and implementing payment reform.

The 10 HACs being studied are:

- Adverse drug events (anticoagulants, opioids, and hypoglycemic agents).
- Catheter-associated urinary tract infections.
- Central line-associated bloodstream infections.
- Falls.
- Obstetric adverse events.
- Pressure ulcers.
- Surgical Site Infections.

- Ventilator-associated pneumonia.
- Venous thromboembolism (all, not just ICU).
- Clostridium difficile Infections.

The additional cost and mortality associated with 9 of the 10 HACs (does not include *Clostridium difficile* Infections) had been estimated during 2010-2011 as part of developing the projection for the HHS Partnership for Patients program. This contract was to update those estimates with new data and techniques.

Target Audiences

Target audiences include AHRQ, the Centers for Medicare & Medicaid Services, and other parts of HHS engaged in patient safety and quality improvement efforts.

Methods

- Systematic Review. The researchers will review the published and grey literature using HAC-specific medical subject heading search terms in combination with terms designed to identify publications on incremental costs and attributable mortality. Trained reviewers will assess the relevance and quality of the publications. The studies identified through this review will form the foundation of our estimates of incremental costs and attributable mortality.
- Meta-Analysis. Key parameters related to cost and mortality estimation will be abstracted from all relevant articles identified in the systematic review and entered into a database. Then estimates will be standardized across studies to ensure comparability. Finally, meta-analysis will be conducted to combine estimates into single consensus estimates of incremental costs and attributable mortality for each HAC.

Project Settings

NORC and Emory University are performing this work as a joint research project; the project does not include an onsite pilot or implementation component.

Key Tasks/Activities

- Establish search criteria for each HAC of interest.
- Perform article screening and full-text evaluation of relevant literature identified.
- Extract key hospital cost and mortality parameters from literature into an abstraction database.
- Harmonize hospital costs and mortality estimates.
- Perform meta-analysis to synthesize estimates from the literature.
- Present cost and mortality estimates for the 10 specific HACs.

Deliverables

Final Report

-
1. See *Saving Lives and Saving Money: Hospital-Acquired Conditions Update*, available at <https://www.ahrq.gov/professionals/quality-patient-safety/pfp/2014-final.html>

ACTION III Project Summary: Identifying, Assessing, and Balancing Competing Risks of Multiple Hospital-Acquired Conditions

Contractor: Regents of the University of Colorado

Principal Investigator: Heidi Wald

Project Director: Mark Gritz

Additional Key Personnel and Subcontractors

- Mary Beth Makic, University of Colorado College of Nursing
- Blaine Reeder, University of Colorado College of Nursing
- Kathleen Stevens, University of Texas Health Science Center at San Antonio

Project Period: 9/26/2016-9/25/2018

Total Cost: \$674,416

AHRQ Contact: Noel Eldridge

Project Type: Pilot Test/Proof of Concept; Product Development

Project Purpose, Goals, and Objectives

The goals of this project are to:

- Increase our understanding of the extent to which multiple hospital-acquired conditions (HACs) in inpatient settings may be interrelated such that strategies for preventing one HAC may increase risks for one or more other HACs;
- Develop and pilot test a prototype decision support tool that informs clinicians' treatment decisions for specific patients, taking into account patient-specific risk factors for multiple HACs to improve overall patient safety in acute care settings; and
- Assess the potential system-level cost implications of these competing risks.

Background and Significance

A 2010 report from the Office of the Inspector General estimated that one in seven hospitalized Medicare beneficiaries experienced an adverse event during their hospital stay that resulted in patient harm. The estimated cost of these events is more than \$4 billion annually. Forty-four percent of such events are thought to be preventable.

A reduction in the rates of HACs has been a key goal for the Centers for Medicare & Medicaid Services (CMS), the Agency for Healthcare Research and Quality (AHRQ), and the Department of Health and Human Services. CMS has pursued this goal through the use of financial incentives and public reporting, and AHRQ has bolstered these efforts by supporting the development, implementation, and dissemination of interventions targeting specific, high-impact, and largely preventable HACs for elimination.

The HACs of interest include falls, hospital-acquired pressure ulcers (HAPUs), and several hospital-acquired infections. Together, these conditions account for a large burden of harm and billions of dollars of additional healthcare expenditures. While reductions in these events have been seen, a recent plateau in improvement suggests that we do not fully understand the complexities of harm prevention in acute care.

One potential challenge merits particular consideration: specifically, the possibility that an intervention designed to prevent one HAC may increase the risk of a different HAC. For example, there may be competing risks for simultaneously preventing catheter-associated urinary tract infections (CAUTI), falls with injury, and HAPUs, since they are interrelated, nursing-sensitive conditions that can simultaneously afflict an individual patient or particular patient population.

An improved understanding of the competing risks across multiple HACs will be immediately useful in helping guide clinical care decisions. More specifically, with the decision support tool developed under this project, frontline staff in acute care settings will be able to provide patient-centered, data-driven assessment of risks/benefits of HAC prevention strategies. Ultimately, the project will improve patient safety by reducing multiple HACs.

Target Audiences

The knowledge and tool developed under this project are targeted for use by clinicians in acute care hospitals.

Methods

Falls, HAPUs, and functional incontinence leading to use of an indwelling urinary catheter (IUC), which is known to be associated with CAUTIs, share at least four common risk factors:

- Advanced age,
- Impairments in physical function,
- Diminished cognitive function, and
- Mobility constraints.

Thus, many adult inpatients are at high risk for developing all three of these HACs. The project applies a competing-risk latent failure time model to quantify the tradeoffs in the likelihood of each HAC related to the decision to remove or leave an IUC in place, taking into account patient-specific characteristics, such as pressure ulcer risk assessments and fall risk assessments.

The results from the model will provide predictive values presented in a pilot-tested HAC Risk Dashboard that enables frontline clinicians to create patient-specific, evidence-based prevention plans, taking into account the interaction across interventions for competing risks. The results will also provide hospital/health system administrators predicted HAC-related costs for CAUTIs, falls, and HAPUs for patients with an IUC at some point during their inpatient stay.

Costs of each of these three HACs will be obtained from AHRQ or the Partnership for Patients estimates of the additional hospital inpatient cost of each HAC. These incremental cost estimates will be combined with the competing-risk latent failure time model predicted probability of each HAC to estimate the likely costs of alternative treatment decisions through “what-if” calculations. For example, predicted cost differences from removing an IUC after 2 days versus after 3 days, taking into account the difference in the probability of each HAC for different patient characteristics.

Project Settings

- Colorado Action Partnership Team:
 - University of Colorado School of Medicine, Aurora, CO, Project Lead
 - University of Texas Health Science Center at San Antonio, Implementation Science Research Network, Hospital Partnerships Lead
- Sites contributing data:
 - Denver Health, Denver, CO
 - Memorial Health System, Long Beach, CA
 - Methodist Health System, Omaha, NE
 - Oschner Clinic, New Orleans, LA
 - University of Colorado Health System, Aurora, CO

Key Tasks/Activities

- Create a multisite database consisting of merged electronic health record, infection surveillance, and incident reporting system data from five to seven collaborating hospitals/health systems.
- Analyze the merged database to assess the competing risks of the prevention strategies associated with the identified HACs.
- Develop a prototype HAC Risk Dashboard Decision Support Tool to assist frontline clinicians in making specific treatment and HAC-prevention decisions for their patients.
- Test the usability of the tool in three to five hospitals.
- Revise the tool based on user feedback, using human factors design methods that are user centered.
- Disseminate project findings through peer-reviewed publications and other dissemination avenues.

Expected Deliverables

- Merged Multisite Dataset Documentation
- Documentation of Estimation Results
- High-Fidelity Risk Dashboard
- Excel-Based Decision Support Tool
- Manuscript for Peer-Reviewed Journal on Competing Risks
- Manuscript for Peer-Reviewed Journal on Decision Support Tool
- Final Report

ACTION III Project Summary: Workflows To Improve Safety and Efficiency in Laboratory Testing (WISE-LT)

Prime Contractor: Regents of the University of Colorado

Principal Investigator: Jack Westfall

Project Director: Mark Gritz

Additional Key Personnel: Doug Fernald, Don Nease, and Bethany Kwan

Project Period: 9/30/2016-9/29/2017

Total Cost: \$533,890

AHRQ Contact: Richard Ricciardi

Project Type: Pilot Test; Product Development

Project Purpose, Goals, and Objectives

The goal of this project is to *improve standardization and systemization of laboratory testing processes* using a quality improvement-based toolkit to ensure that patients undergoing laboratory testing in the ambulatory setting do so safely and without harm from laboratory testing mistakes.

The primary objectives of this project are:

- Optimize the *practicality* and *relevance* of an existing toolkit through iterative review and revisions from patient safety experts, primary care clinicians, staff, and patients.
- Implement and evaluate the improved, practical toolkit in two medium or large primary care practices, focusing the efforts on the most common diagnostic tests, primarily blood and urine tests.

Background

Primary care is the largest single platform of formal healthcare delivery in the United States, with more than 500 million primary care office visits annually, accounting for more than 54 percent of physician office visits. Primary care practitioners order laboratory tests for nearly one-third of patient encounters in an average week. Laboratory testing is a known source of medical errors in primary care settings.

AHRQ and the Centers for Disease Control and Prevention have funded work to develop laboratory testing process improvement toolkits for ambulatory care settings. These toolkits often use the same tools and techniques used in a wide array of practice improvement initiatives and are not specific to a particular patient population, disease, or care setting.

Among the tools and techniques are rapid-cycle tests of change (e.g., Plan-Do-Study-Act cycles), regular use and review of quality data (e.g., clinical quality measures), team approaches (e.g., team-based care, improvement teams), and practice improvement modules for certification and professional licensure (e.g., American Board of Family Medicine, American Board of Pediatrics, and American Board of Medical Specialties). Underscoring these techniques is the importance of effective teams and teamwork, now widely promoted in quality improvement work in healthcare settings.

Existing toolkits provide comprehensive approaches to improving laboratory testing processes in ambulatory care settings; however, staff in these care settings often view these tools as overwhelming and requiring external assistance from coaches or consultants. The AHRQ-developed [Improving Your Office Testing Process Toolkit](#) is a prime example of an evidence-based comprehensive toolkit that potential users have described as overwhelming but, if revised to be more practical and easy to implement, would improve laboratory testing processes and patient safety.

The major refinements to this toolkit include:

- Streamlining the toolkit and providing a roadmap to guide users to the activities most appropriate to their situation.
- Revising the content to align with rapid-cycle “Plan-Do-Study-Act” quality improvement processes.
- Identifying discrete activities that can be implemented by teams of clinicians and staff in 6 to 8 weeks without outside assistance through the addition of easy-to-follow, step-by-step processes.

Significance and Expected Impact

Among medical errors in primary care, an estimated 15 percent to 54 percent are attributed to laboratory testing processes. For example, a study of Colorado primary care practices found that nearly half (47%) of reported errors were associated with laboratory testing. Moreover, a 2013 study estimated that outpatient diagnostic errors may involve approximately 12 million U.S. adults each year, and half of these errors are potentially harmful. A more practical and easy-to-implement toolkit to standardize and systematize laboratory testing workflows and processes can reduce the occurrence of testing errors and significantly improve patient safety in ambulatory settings.

Target Audiences

The toolkit is intended for use by staff in primary care practices, while the ultimate beneficiaries of improving the safety of diagnostic laboratory testing are the patients they serve.

Methods, Tasks, and Activities

- Review literature and solicit expert and stakeholder opinion on current patient safety practices, toolkits, and resources that rely on team approaches and standardization techniques.
- Identify needed modifications to AHRQ’s [Improving Your Office Testing Process Toolkit](#) using iterative reviews by patient safety experts and through focus groups with primary care clinicians, staff, and patients in the 16 counties of eastern Colorado and the Denver metropolitan area.
- Create the streamlined Improving Your Office Testing Process: Workflows To Improve Safety and Efficiency in Laboratory Testing (WISE-LT) Toolkit that is concise, portable, and easy to use with step-by-step guidance.
- Implement the WISE-LT Toolkit in two medium to large ambulatory primary care settings.

- Evaluate how the toolkit is integrated into practice workflows, how easy it is to use, and how well it can be implemented without assistance from an external facilitator or coach.
- Produce two case study reports (one from each field test practice) of findings from each site, including a synthesis of common challenges across the sites.

Project Settings:

- University of Colorado School of Medicine, Aurora, CO, Project Lead
- State Networks Of Colorado Practices and Partners (SNOCAP) – High Plains Research Network, BIGHORN, and CaReNet practice-based research networks
- American Academy of Family Physicians, National Research Network, Leawood, KS

Expected Deliverables

- Revised Toolkit
- Final Case Study Reports and Synthesis of Lessons Learned, including Implementation Guidance Materials

ACTION III Project Summary: The Academy for Integrating Behavioral Health and Primary Care

Prime Contractor: Westat, Inc.

Principal Investigator: Benjamin Miller, Psy.D. (University of Colorado School of Medicine, Department of Family Medicine)

Project Director: Garrett Moran, Ph.D. (Westat)

Additional Key Personnel and Subcontractors

- Joshua Noda, M.P.P. (Westat), Project Manager
- Rebecca Noftsinger (Westat), Task Lead for National Integration Academy Council
- Glynis Jones, M.S. (Westat), Task Lead for Dissemination
- Department of Family Medicine at the University of Colorado School of Medicine
- Informatics Studio

Project Period: 9/30/2016-9/29/2019

Total Cost: \$1,000,000

AHRQ Contact: Parivash Nourjah

Project Purpose, Goals, and Objectives

The goals of this project are to use AHRQ's Academy for Integrating Behavioral Health and Primary Care (the Academy) to:

- Provide technical assistance and support to AHRQ grantees working to increase access to medication-assisted treatment (MAT) for opioid use disorders (OUDs) in rural primary care practices across Oklahoma, Colorado, Pennsylvania, and North Carolina, and
- Develop and disseminate resources and information to support the broader implementation of MAT in rural primary care practices elsewhere in the United States.

Background and Significance

The increasing rate of deaths due to opioid overdoses has made the prevention and treatment of OUDs one of the top public health priorities in the country. According to the Centers for Disease Control and Prevention, the number of deaths from opioid overdose in 2014 was the highest ever recorded, with an average of 78 people dying each day.

MAT, in combination with supportive psychosocial services, has been shown to be an effective treatment for opioid addiction. However, MAT is considered to be underused by providers, with only 1 million of the 2.5 million Americans who might benefit from MAT having received it. Moreover, while the rates of prescription opioid overdoses are significantly higher in rural areas, people who might seek MAT in rural parts of the country find it harder to access treatment due to a lack of trained providers.

In 2016, AHRQ funded four grants to improve access to MAT for thousands of residents across rural areas of Oklahoma (28 counties), Colorado (24 counties), Pennsylvania (23 counties), and North Carolina (22 counties). The grants are designed to identify and implement effective strategies for increasing the number of physicians and other prescribing professionals (nurse practitioners and physician assistants) who provide MAT to patients struggling with OUDs. An

additional goal of the grants is to identify approaches to overcome barriers to implementation of MAT services that can be shared across grantees and ultimately with other rural regions of the country.

This project will use the Academy to extend the work of the grantees by providing them with technical support and disseminating the knowledge they acquire to support similar efforts beyond the communities directly benefited by the grantees' current efforts. The Academy is uniquely positioned to serve in this capacity since it was established with the purpose of serving as a coordinating center and national resource for people committed to integrating mental health and substance use treatment with primary care.

Target Audiences

The primary target audience is the AHRQ-funded grantees supporting physicians and other prescribers implementing MAT in rural primary care settings. Ultimately, the people who will benefit from the Academy's work will be individuals with OUDs who live in these rural settings and will have better access to treatment, as well as their families and communities, who will be spared the loss of contributing members.

Methods

Support for providers implementing MAT for OUDs will be provided by leveraging the existing platform of the Academy while updating it to include a specific emphasis on MAT. The work of this project will be guided by the insight of the expert panel, the National Integration Academy Council (NIAC), as well as the demonstrated needs of the AHRQ-funded grantees.

The Academy Portal will serve as the hub for the Implementation Community Network (ICN), which will help disseminate information about implementing MAT for OUDs to providers in rural primary care settings. Technical assistance will be provided to the grantees and their participating practices through:

- Updated web content specific to the topic of MAT for OUDs,
- An updated literature collection that includes the evidence base of MAT in primary care settings,
- An updated Community with MAT-specific groups and discussion threads to promote peer-to-peer communication,
- Webinars and other supporting materials that serve as additional learning opportunities and resources related to best practices for implementing MAT in rural primary care settings, and
- An eNewsletter to communicate relevant information, news, and events to grantees.

The Portal will also serve as the platform through which additional providers, researchers, and the broader public can access the evidence base and literature collection, as well as lessons learned from the project regarding promising practices for increasing MAT prescribing in rural primary care settings.

Project Settings

As the contractor for this project, Westat, in partnership with the Department of Family Medicine at the University of Colorado School of Medicine, will serve as the primary setting for the work

performed under this task order. All project management, support for the NIAC and grantees, and Academy Portal updates and content management will be done by the project team at Westat's headquarters in Rockville, Maryland, or in the Department of Family Medicine in Denver, Colorado.

Key Tasks/Activities

- **Environmental Scan:** An environmental scan will be conducted to identify the available literature related to implementing MAT in rural primary care settings that should be added to the Portal's literature collection.
- **NIAC Expert Panel:** The NIAC Expert Panel will hold an annual in-person meeting and three quarterly meetings by video conference to discuss the work of the Academy and how to provide additional resources and support for providers implementing MAT in rural primary care settings.
- **The Academy Portal Updates:** The Academy Portal will be updated to include resources and news related to the use of MAT for OUDs in rural primary care settings. The Community feature of the Portal will also serve as a hub for grantees and others within the ICN to discuss challenges and share information.
- **Technical Assistance:** An ICN will provide technical assistance to the grantees and other providers implementing MAT. Mechanisms of communication and technical assistance will include an eNewsletter, webinars, and posting of updated resources.
- **Dissemination of Findings:** Project staff will synthesize the findings across the AHRQ-funded grants to summarize the lessons learned and will assist grantees in disseminating their findings through the Academy Portal.

Deliverables

- Final NIAC Meeting Schedule and Plan; Meeting Summary Reports
- Plans for Ongoing Support; Updates to the Academy Portal; Web Content; Updating the Commons; Implementation Community Network (ICN)
- Environmental Scan
- Plan for Dissemination of Findings From AHRQ-Funded Grantees