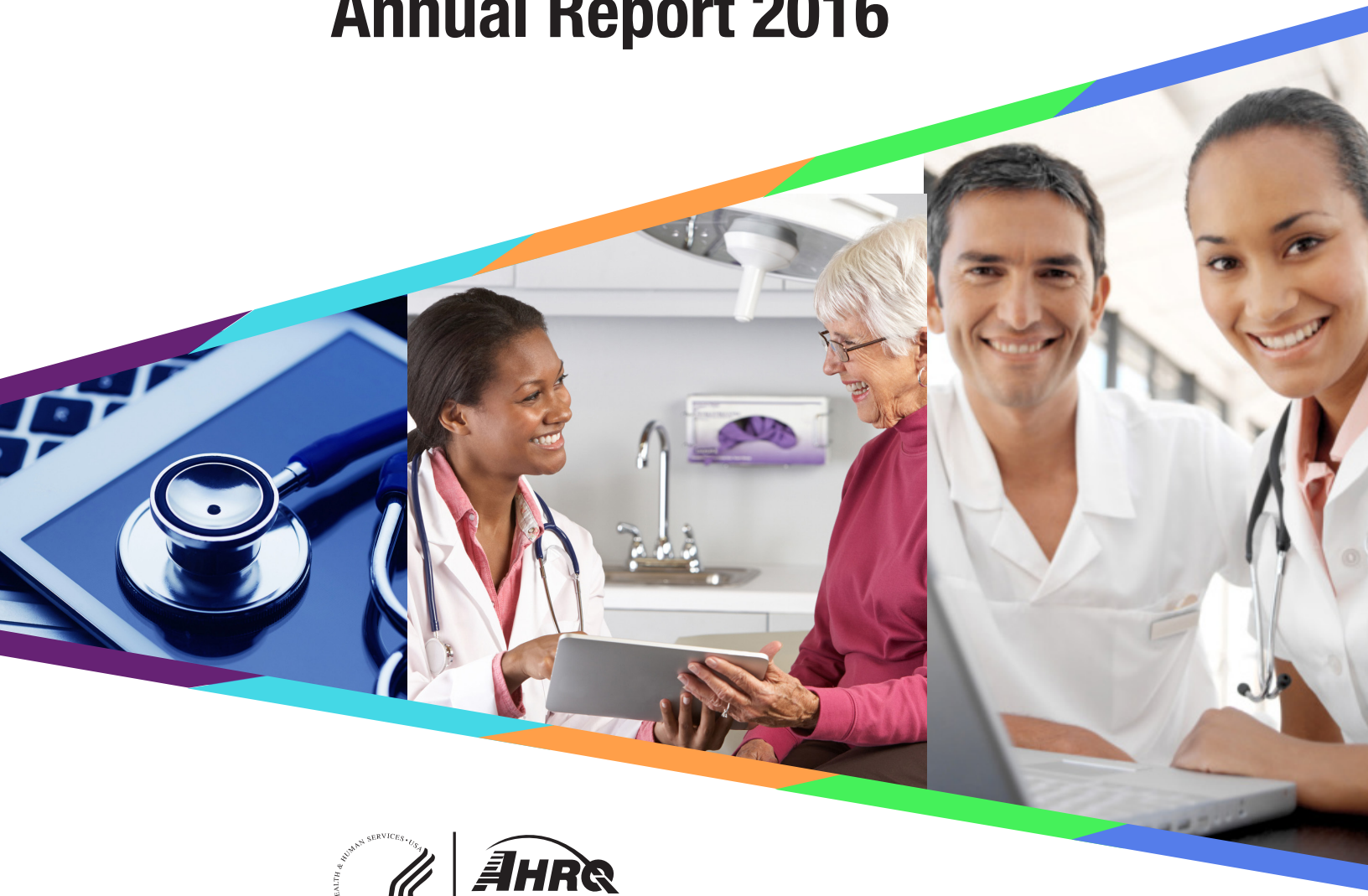
AHRQ Health Information Technology

Annual Report 2016



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Agency for Healthcare Research and Quality

AHRQ Health Information Technology Division's 2016 Annual Report

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I. About the Health IT Division

The Agency for Healthcare Research and Quality (AHRQ) Health Information Technology (IT) Division's mission is to produce and disseminate evidence about how health IT can make healthcare safer, higher quality, more accessible, equitable, and affordable, and to work within the U.S. Department of Health and Human Services and with other partners to make sure that the evidence is understood and used. Beginning in 2004, AHRQ has worked to fulfill this mission by investing in more than 500 research grants and contracts awarded to over 270 distinct institutions in 48 States and the District of Columbia.

AHRQ has focused its health IT activities on improving healthcare decision making, supporting patient-centered care, and improving the quality and safety of medication management. Early efforts evaluated the facilitators and barriers to health IT adoption and the value of health IT implementation. More recent efforts have focused on understanding healthcare providers' information needs and healthcare decision making processes to inform health IT development, understanding how consumers use health IT to manage and access their personal health information, and using health IT to collect and effectively use patient-reported outcome measures.

In 2016, AHRQ supported new research projects to build on the evidence to improve the quality, safety, effectiveness, and efficiency of U.S. healthcare through the power of health IT. These research projects focused on: determining how patient-facing technologies can best improve the quality and effectiveness of care, how health IT itself can be safely used and implemented, use of mobile health technology to facilitate the dissemination and implementation of findings from patient-centered outcomes research (PCOR) into clinical practice, and how to design and implement electronic health records (EHRs) so that they are more intuitive to use and more readily support clinical workflow. In addition, AHRQ funded new grants in 2016 to continue its support of the next generation of health IT-focused researchers. See Section V for the full list of projects active during 2016.

This report highlights the 152 projects funded by AHRQ's Health IT Division that were active at any time during 2016. These projects span various areas of interest, funding mechanisms, and geographic distribution.

Individual project profiles for all active and closed projects, project-related news, and publications are available on the AHRQ Health IT website at www.healthit.ahrq.gov.

II. Health IT Division Projects

A. Funding Opportunities

The Health IT Division uses a variety of funding mechanisms to achieve its research goals; these include grants, contracts, and interagency agreements (IAAs). Each mechanism specifies the content, format, and timeline for deliverables, including periodic reporting requirements for completion of milestones and budget updates. Collectively, these mechanisms provide funding for a wide variety of health services research and administrative activities and are described in more detail below.

Grants

Grants provide money, property, or other direct assistance for approved projects or activities that support a public purpose that does not directly benefit the government. Grant proposals are submitted to AHRQ in response to a funding opportunity announcement (FOA). One-time FOAs are known as request for applications (RFAs), and recurring FOAs are known as program announcements (PAs).

There were 150 Health IT Division funded grants active at any time during calendar year 2016, with lifetime AHRQ funding equaling $152.6 million. Lifetime AHRQ funding refers to the total financial support that AHRQ obligates to a project during the entire project period.

Grants active during calendar year 2016 were awarded under the following programs.

Health IT Funding Opportunities. Active grants were supported by the following ongoing or closed Health IT Division funding opportunities.

Small Research Grants to Improve Healthcare Quality Through Health IT (R03) (PAR-08-268): Supports different types of small research studies including: 1) pilot and feasibility or self-contained health IT research projects, 2) secondary data analysis of health IT research, and 3) economic prospective or retrospective analyses of health IT implementation. Funding through this program announcement is now closed. There was one remaining grant funded through this initiative that was active in 2016.

Exploratory and Developmental Grant to Improve Healthcare Quality Through Health IT (R21) (PAR-08-269, PA-14-001): Provides funding for health IT exploratory and developmental research projects that support the conduct of short-term preparatory, pilot, or feasibility studies. The R21

Grant Highlight: Ambulatory Clinic Exam Room Design with Respect to Computing Devices to Enhance Patient Centeredness (R03 HS 024488)

The use of computers during patient care is hampered by traditional exam rooms not designed to accommodate the workflow changes brought about by computing. This issue has been found to directly impact the provider-patient relationship. This project is prototyping and evaluating a redesigned exam room layout that considers exam room computing. It will compare the redesigned layout to a current, typical exam room layout. The redesigned exam room will then be implemented in a live clinic setting, and be compared to currently designed exam rooms.

grants are intended to be more comprehensive and broader in scope than projects supported by R03 FOAs. There were 59 projects active during 2016 funded under these R21 program announcements.

Disseminating and Implementing Evidence from Patient-Centered Outcomes Research in Clinical Practice Using Mobile Health Technology (R21) (HS-14-010): This FOA provides funding to develop and evaluate the effectiveness of novel approaches that use mHealth tools to enable the timely incorporation and appropriate use of PCOR evidence in clinical practice. Ten projects have been funded through this initiative; all were ongoing as of the end of 2016.

Utilizing Health IT to Improve Healthcare Quality Grant (R18) (PAR-08-270): Supported demonstration research grants that studied health IT implementation and use to improve the quality, safety, effectiveness, and efficiency of healthcare in ambulatory settings and transitions between care settings. This PA expired in May 2011; however, there were still three grants active during 2016. All ended by the end of the year.

Understanding Clinical Information Needs and Healthcare Decision Making Processes in the Context of Health IT (R01) (PA-11-198): Funds research aimed at elucidating the nature of cognition, task distribution, and work flow in healthcare delivery settings. While this program announcement is now closed, during 2016 there were 16 active projects funded through this program announcement.

Understanding User Needs and Context to Inform Consumer Health IT Design (R01) (PA-11-199): Funds projects that help build a knowledge base about consumers' personal health information management needs and practices and related design principles. This program announcement, now closed, funded 12 projects that were all active as of the end of 2016.

Active Aging: Supporting Individuals and Enhancing Community-Based Care through Health IT (P50) RFA (HS-10-016)**:** This FOA focused on applied research with the objective of developing sustainable and reproducible strategies to translate research into practice effectively and efficiently. This RFA is now closed. There was one project funded in 2011; it was ongoing at the end of 2016.

Patient-Centered Outcomes Research Clinical Decision Support Learning Network (U18) RFA (HS-15-003): This funding supports the development of the Patient-Centered Outcomes Research (PCOR) Clinical Decision Support (CDS) Learning Network. The purpose of the PCOR CDS Learning Network is to engage stakeholders in the dissemination and implementation of PCOR findings through CDS, and to promote incorporation of PCOR into clinical practice through CDS. One grant was funded in 2016 and was ongoing at the end of the year.

Electronic Data Methods (EDM) Forum: Second Phase (U18) (RFA-HS-13-004)*:* This FOA supported one project to continue and expand the work of the Electronic Data Methods Forum. This project was ongoing at the end of 2016.

Other Health IT-Funded Grants. In addition to the grants described above, the Health IT Division funds grants with a health IT focus that are solicited through the following general Agency FOAs:

Conference Grant Program Awards (R13) (PA-13-017): AHRQ supports conferences that help to further its mission to improve the quality, safety, efficiency, and effectiveness of healthcare for all Americans. Two health IT-focused conference grants were active during 2016.

***Career and Dissertation Awards (R36, K01, K08)*:** In 2008, AHRQ published a Special Emphasis Notice (SEN) (NOT-HS-08-014), to fund Career Development (K01, K08) and Dissertation (R36) grants designed to support the next generation of health IT-focused researchers. In 2011, this SEN was reissued (NOT-HS-11-016).

- AHRQ Grants for Health Services Research Dissertation (R36) (PA-12-256, PA-15-318). There were two AHRQ funded dissertation projects active in 2016; both ended by the end of the year.
- Mentored Clinical Scientist Research Career Development Award (K08) (PAR-09-085, PA-13-039). There were six K08 projects active in 2016.
- Mentored Research Scientist Research Career Development Award (K01) (PAR-09-087). There were two K01 projects active in 2016.

Patient-Centered Outcomes Research Pathway to Independence Award (K99/R00) (RFA-HS-13-002): The purpose of this funding is to increase and maintain a strong cohort of new and talented AHRQ-supported independent investigators trained in comparative effectiveness methods to conduct patient care outcomes research. One health IT-focused project was funded in 2013 and was ongoing at the end of 2016.

Patient-Centered Outcomes Research Mentored Clinical Investigator Award (K08) (PA-13-180): This funding provides support for an intensive, mentored research career development experience in comparative effectiveness research methods as applied to PCOR. One health IT-focused grant was funded in 2016 and was ongoing at the end of the year.

Small Research Grant Program (R03) (PA-15-147): Supports different types of small research studies including: pilot and feasibility studies; secondary analysis of existing data;

Grant Highlight: A Geofencing-Based Adaptive Messaging System to Support Patient Self-Management of a Low-Sodium Diet in Hypertension (R21 HS 024567)

High dietary sodium intake is linked to hypertension, stroke, heart failure, and kidney disease. Average sodium intake for Americans is high at 3,400 mg per day. Most patients prescribed a low-sodium diet are unaware of the sodium content of the foods they eat. This project is developing and evaluating a mobile application that incorporates geofencing technology and provides mobile push messages in grocery stores and restaurants, the two main locations where patients with hypertension interact with processed and prepared foods.

small, self-contained research projects; development of research methodology; and development of new research technology. Two health IT-focused research grants were awarded in 2016 through this PA; both were ongoing at the end of the year.

AHRQ Health Services Research Demonstration and Dissemination Grants (R18, PA-09-071, PA-13-046, PA-14-290). The AHRQ Health IT Division funds health IT demonstration and dissemination projects through an Agency-wide FOA. During 2016, there were a total of three active grants funded through these program announcements.

AHRQ Health Services Research (R01): AHRQ funds projects through an Agency-wide FOA (PA-09-070, PA-13-045, PA-14-291) for ongoing extramural grants for research, demonstration, dissemination, and evaluation projects to support improvements in health outcomes, strengthen quality measurement and improvement, and identify strategies to improve access to care. There were 23 active health IT-focused grants funded through these FOAs during 2016.

Centers for Education and Research on Therapeutics (CERTs) (U19, HS-11-004): AHRQ was given responsibility for administering the CERTs demonstration program authorized by Congress as part of the Food and Drug Administration Modernization Act of 1997 (Public Law 105-115). CERTs conduct research and provide education to advance the optimal use of drugs, medical devices, and biological products; increase awareness of the benefits and risks of therapeutics; and improve quality while cutting the costs of care. There were two health IT-focused U19 grants active in 2016.

Research Centers in Primary Care Practice-Based Research and Learning (P30) RFA (HS-12-002): P30 grants support Centers of Excellence in Primary Care Practice-Based Research and Learning, promoting clinical, behavioral, and translational research activities. This FOA is intended for consortiums of three or more regional practice-based research networks (PBRNs), or national PBRNs with at least 120 member practices. There were two health IT-focused PBRN grants funded through this initiative in 2012 that were ongoing at the end of 2016.

Contracts and Interagency Agreements

A contract is an agreement that is initiated by the government to acquire a product or service under specified terms. The AHRQ Health IT Division uses various contract mechanisms to solicit requests for proposals (RFPs), including one-time RFPs and requests for task orders (RFTOs) when a master contract has been issued under an indefinite delivery indefinite quantity (IDIQ) contract. Master contracts are a special type of RFP that are issued to a group of qualified contractors who are then eligible to compete for a subsequent series of RFTOs.

The AHRQ Health IT Division supported one research contract and one IAA that were active in 2016, with lifetime funding totaling $3.29 million.

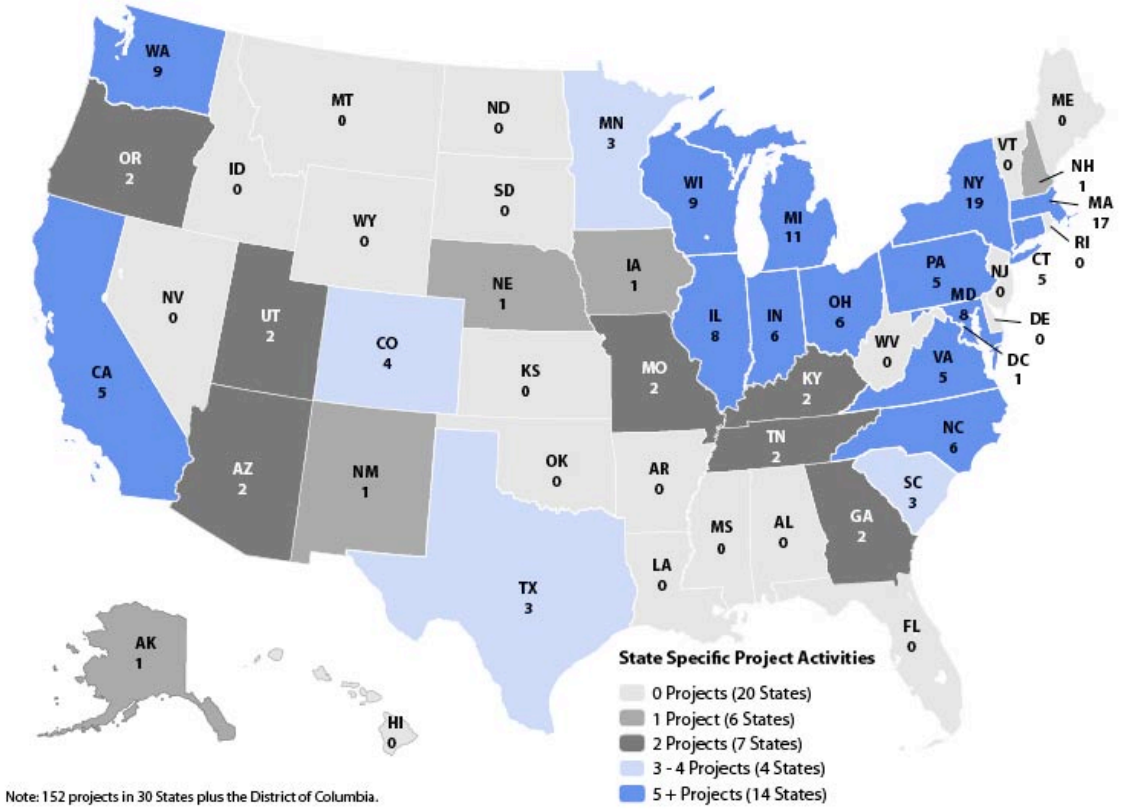
- In 2012, AHRQ and the National Science Foundation funded three research projects through a single IAA (IAA# 12-689F-12, *Advancing Health Services through System Modeling Research*) to address systems modeling in health services research, with a specific emphasis on the supportive role of health IT. Funding for this IAA ended during 2016.

- In 2016, AHRQ contracted with MITRE to generate a systematic and replicable process for transforming PCOR findings into shareable CDS standards and a publicly available CDS prototype (Contract # 290-16-00001U, *Patient-Centered Outcomes Research Clinical Decision Support Prototype Development and Dissemination*). The team will also develop, implement, and integrate CDS products and systems using integrated data and knowledge management.

B. Geographic Distribution of Projects

During 2016, projects were led by organizations located in 30 States plus the District of Columbia (see Figure 1). New York, with 19, was the State with the highest number of active health IT projects, followed Massachusetts and Michigan with 17 and 11 projects, respectively. Projects are classified by the State where the lead organization is located, but many projects include collaborators from multiple organizations. For example, the Research Centers in Primary Care Practice Based Research and Learning grant (Grant # P30 HS 021678) is led by a principal investigator from the Medical University of South Carolina. The research is being conducted within the Practice Partner Research Network (PPRNet), a national practice-based research network with provider members in 43 States.

Figure 1: Number of Projects Active in 2016 Sponsored by AHRQ's Health IT Division by State



Note: 152 projects in 30 States plus the District of Columbia.

C. Characteristics of Health IT Projects

AHRQ funds diverse projects that focus on a range of health IT technologies, interventions, populations, medical conditions, settings, and type of care. Once a project is awarded, projects are reviewed and categorized using a detailed taxonomy. Projects may include one or more of any of these taxonomy categories.[1]

Technologies

Projects are categorized by the health IT application or intervention being studied (Table 1) and can be tagged using more than one technology. The most common health IT category was EHRs/electronic medical records (EMRs) (48), followed by CDS (39), and mobile devices (25).

The *Patient-Centered Postoperative Wound Surveillance Using Current Technology* (Grant # R21 HS 023395) project is one example of a project categorized by more than one technology: mobile phone and telemedicine. This particular project, led by Dr. K. Craig Kent, is developing and evaluating a patient-centered program called the Outpatient Wound Surveillance Program in which patients submit photos of their wound daily to the surgical service via their smartphone to allow their providers to remotely monitor wound recovery in the transitional period between hospital discharge and routine clinic follow-up.

Table 1: Technologies Studied

Technologies	Total
Electronic Health Record/Electronic Medical Record	48
Clinical Decision Support System	39
Mobile Device - Unspecified	25
Consumer Health Informatics	18
Patient Portal	16
Mobile Phone	11
Natural Language Processing System	10
Dashboard	9
Clinical Documentation	6
Voice Recognition	6
Machine Learning	5
Patient-Generated Health Data	5
Personal Health Record	5
Telemedicine System	5
Virtual Reality	5
Computerized Provider Order Entry System	4
Health Information Exchange	4
Internet	4
Remote Patient Monitoring	4
Secure Messaging	4
Text Messaging	4

[1] Project categories are up to date as of August 14, 2017. Projects categories may be updated when a project changes its approach and methodologies

Technologies	Total
Registry	3
Bioinformatics and Genomics	2
Clinical Informatics	2
Electronic Prescribing	2
Architecture	1
Clinical Messaging	1
Data	1
Electronic Dental Record	1
Geographic Information System	1
Imaging System	1
Informatics	1
Kiosk	1
Knowledge System	1
Public Health Reporting System	1
Radio Frequency Identification Device	1
Radiology Information System	1
Social Media	1
Standards and Classification System	1
Total	**260**

Medical Conditions Studied

The AHRQ Health IT Division funds projects that study a variety of medical and health conditions, including cardiovascular disease, cancer, and substance abuse. Many of the projects evaluated the impact of an intervention on multiple health conditions or examined patients with co-morbid conditions.

For example, in the *Electronic Medication Adherence Reporting and Feedback During Care Transitions* project (Grant # R21 HS 024587), led by Dr. Jeffrey Schnipper at Brigham and Women's Hospital (BWH), the team is evaluating the effect of a smart pillbox intervention on the control of chronic conditions including hypertension, hyperlipidemia, and diabetes.

The most common medical conditions studied were unspecified chronic conditions (19), followed by mental and behavioral health (9), and diabetes (7). See Table 2 below.

Table 2: Medical Conditions Studied of Project Research

Medical Conditions	Total
Chronic Conditions	19
Mental/Behavioral Health	9
Diabetes Mellitus	7
Cardiovascular Disease	6
Hypertension	6
Cancer - Unspecified	5
Asthma	4
Gastrointestinal Disease	4

Medical Conditions	Total
Obesity	4
Infectious Disease*	4
Breast Cancer	3
Congestive Heart Failure (CHF)	3
Coronary Artery Disease (CAD)	3
HIV/AIDS	3
Pregnancy	3
Substance Abuse	3
Tobacco Use	3
Cervical Cancer	2
Chronic Obstructive Pulmonary Disease (COPD)	1
Colorectal Cancer	1
Hyperlipidemia (HL)	1
Multiple Sclerosis	1
Neurologic Disease	1
Prostate Cancer	1
Respiratory (Lung) Disease	1
Sickle Cell Anemia	1
Stroke	1
Xerostomia	1
Total	**101**

**Infectious Disease includes viral, bacterial, and respiratory infection.*

Care Setting and Type of Care

Projects are categorized by the care setting (Table 3) and type of care (Table 4) of their research. For care setting, 45 projects active in 2016 were conducted in ambulatory settings. Thirty-one projects focused on inpatient care in hospitals, and 28 studies focused on care in patient homes.

Table 3: Care Setting of Project Research

Care Setting	Total
Ambulatory Setting	45
Hospital*	31
Patient Home	28
Academic Medical Center	24
Emergency Department	17
Outpatient	5
Perioperative/Operative	5
Federally Qualified Health Center	4
Intensive Care Unit	4
Community Health Center	3
Veteran Affairs Medical Center	3
Across the Healthcare System	2
Integrated Delivery Network	2
Long-Term Care Facility	2
Ambulatory Surgical Center	1
Behavioral Health Clinic	1

Care Setting	Total
Dental Practice	1
Laboratory	1
Pharmacy	1
Rehabilitation Center	1
Total	**181**

**Note: Hospital includes projects tagged as inpatient.*

For type of care, 42 projects focused on primary care, followed by acute care (27) and specialty care (21). See Table 4.

The *Clinical Decision Support Optimizing Necrotizing Enterocolitis Prevention Implementation in Neonatal Intensive Care Unit (NICU)* project (Grant # K08 HS 022908) is one example of a project categorized as both pediatrics and acute care. This project, led by Dr. Sheila Gephart, is integrating CDS into providers' workflow in NICUs to deliver evidence-based guidelines for early recognition and prevention of necrotizing enterocolitis, a serious life-threatening complication of fragile premature infants.

Table 4: Type of Care in Project Research

Type of Care	Total
Primary Care	42
Acute Care	27
Specialty Care	21
Self-Management	16
Pediatrics	15
Surgery	5
Tertiary Care	4
Behavioral Health	3
Home Healthcare	3
Ambulatory Care	2
Family Medicine	2
Long-Term Care	2
Obstetrics and Gynecology	2
Orthopedics	2
Dentistry	1
Multi-Specialty Care	1
Preventive Care	1
Secondary Care	1
Urology	1
Total	**151**

Healthcare Theme

Projects are also categorized by healthcare theme of the project (Table 5). Thirty-one projects active in 2016 were focused on patient-centered care. Twenty-two projects studied interventions to increase patient safety, and 19 projects focused on human factors research.

The Role of Privacy in Practice: Electronic Health Records in Pediatrician Interactions with Patients project (Grant # R03 HS 021537), awarded to Dr. Timothy Stablein, is one example of a project that is categorized by patient-centered care. The project examined how the use of EHRs affected doctor-patient interaction, privacy, delivery of care, and disclosure among pediatric providers and their adolescent patients. Researchers conducted patient and provider interviews to evaluate opinions of how EHRs supported patient-centered care and facilitated information sharing in healthcare.

Table 5: Healthcare Theme in Project Research

Healthcare Theme	Total
Patient-Centered Care	31
Patient Safety	22
Human Factors	19
Mobile Health	19
Patient Engagement	18
Quality Improvement	17
Chronic Disease Management	16
Patient-Reported Outcomes	16
Transitions in Care	15
Technology Usability	14
Clinical Decision Making	13
Patient Education	12
Clinical Workflow	11
Preventive Medicine	10
Care Coordination	9
Medication Adherence	9
Sociotechnical Aspects	9
Quality Measurement	7
Care Planning	5
Medication Safety	5
Medication Management*	5
Adverse Events	4
Interoperability	4
Medication Errors	4
Telehealth	4
Access to Care	3
Medication Reconciliation	3
Personalized Medicine	3
Learning Health System	2
Meaningful Use	2
Smoking Cessation	2
Total	**313**

**Note: Includes projects tagged as medication or medication management.*

Target Populations Studied

The AHRQ Health IT Division funds projects that study various populations, some of which also overlap with AHRQ's priority populations. AHRQ identifies "priority populations" as specified by Congress in the Healthcare Research and Quality Act of 1999 (Public Law 106-129), consisting of groups with unique healthcare needs or issues that require special focus, such as racial and ethnic minorities, low-income populations, and people with special healthcare needs.

Tables 6 through 10 outline the frequencies of projects categorized by each target population; projects can be tagged with more than one category. For example, in the *Improving Diagnosis of Hypertension in Children* project (Grant # R21 HS 024100), Dr. Goutham Rao and his team are studying an intervention that includes education for clinicians and parents with the goal to improve care for children from low-income families and minority populations.

Age

The most common age category was adults (34), followed by children (21), and adolescents and young adults (13).

Table 6: Age Studied

Age Studied	Total
Adult	34
Children	21
Adolescent and Young Adult	13
Elderly	11
Infant	2
Total	**81**

Coverage Population

Eight projects focused on those who were covered by Medicaid or Medicare, or were veterans (Table 7).

Table 7: Coverage Population Studied

Coverage Population Studied	Total
Medicaid	5
Veterans	2
Medicare	1
Total	**8**

OMB Race and Ethnicity Populations

Nine projects focused on specific OMB race and ethnicity populations (Table 8).

Table 8: OMB Race and Ethnicity Studied

OMB Race and Ethnicity Studied	Total
Black or African American	4

OMB Race and Ethnicity Studied	Total
Hispanic or Latino	3
American Indian or Alaska Native	2
Total	**9**

Vulnerable Populations

The most frequent vulnerable populations studied in the projects were individuals with chronic care needs (12), followed by minority populations (11), medically underserved (9), and inner city populations (9).

Table 9: Vulnerable Population Studied

Vulnerable Population Studied	Total
Individuals with Chronic Care Needs	12
Minority Populations	11
Medically Underserved Populations	9
Inner City Populations	9
Low Income Populations	8
Rural Populations	2
Individuals with Disabilities	1
Individuals with Low Literacy	1
Total	**53**

Roles

The projects were also reviewed on the role of the population studied. The most common population roles were physicians (52), caregivers (20), and clinical staff (18).

Table 10: Role Studied

Role Studied	Total
Physician	52
Caregiver	20
Clinical Staff	18
Nurse	13
Researcher	5
IT staff	3
Physician Assistant	3
Vendor	3
Administrator	2
Stakeholder	2
Implementer	2
Nurse Practitioner	2
Pharmacist	2
C-Suite Officer	1
Dentist	1
Decision Maker	1

Role Studied	Total
Payer	1
Public Health Worker	1
Surgeon	**1**
Total	**133**

III. Project Highlights

A. AHRQ Project Highlights from 2016

In 2016, there were many projects that helped develop and disseminate information to add to the health IT knowledge base. A sample of projects is highlighted below.

Use of Health IT to Improve Patient Safety

AHRQ funds projects to study how health IT can improve patient safety and how health IT itself can be safely used and implemented.

Health Information Technology Center for Education and Research on Therapeutics (Grant #U19 HS 021094): Dr. David Bates and a team of investigators at Brigham and Women's Hospital (BWH) created the Health Information Technology Center for Education and Research on Therapeutics (HIT-CERT) to leverage health IT for pharmacosurveillance, medication-related CDS, and to identify new ways to utilize medication-related decision support information. The BWH HIT-CERT addressed key questions around therapeutics and health IT, and contributed to advancement of the state of the art. It also addressed therapeutics issues related to appropriateness, safety, and efficacy in ambulatory, inpatient, and transitional care settings within the context of health IT. The team worked closely with AHRQ and partner organizations to translate research into improved clinical practices relating to medication safety, effectiveness, and cost.

Focus on Consumer Health IT

Increasingly, innovative computer and information systems are being developed to help people manage health concerns, monitor important indicators of their health, and communicate with their caregivers. AHRQ supports research to determine how these patient-facing technologies can best improve the quality and effectiveness of care.

Computer-Supported Management of Medical-Legal Issues Impacting Child Health (Grant #R01 HS 020640): Dr. Amy Gilbert and a team of investigators at Indiana University created an innovative system that dramatically increased the identification of medical-legal issues in pediatric clinics, improved the delivery of appropriate physician counseling, and streamlined access to legal resources when they are needed. This study added a medical-legal screening tool and tailored decision support protocol into the regular healthcare delivery process of an existing computerized CDS system, the Child Health Improvement through Computer Automation system. Initial chart review data found that physicians documented medical-legal needs in the charts of more patients post-intervention.

Improving Health IT Usability

AHRQ's usability research focuses on how to design and implement EHRs so that they are more intuitive to use and more readily support clinical workflow.

Quantifying Electronic Health Record Usability to Improve Clinical Workflow (Grant #R01 HS 021290): Dr. Zia Agha and his Veterans Medical Research Foundation team sought to quantify EHR and clinical workflow activity and patient-provider communication patterns to understand how EHR design affects workflow. The study took place in two different outpatient settings: primary care clinics and medical specialty clinics. Indicators assessed included EHR usage, workflow, physician-patient communication, cognitive load, and user satisfaction. Researchers found distinct differences between simple and complex patient cases in the study, where complexity brings increases in workload due to the EHR not meeting the more complex demands, leading to frustration, distractions from their workflow, and increased demand on cognitive workload. The study found that multiple factors such as visit complexity, patient factors, and EHR technology can influence clinical work, and variations in physicians' personalized work practices and perceived workload.

Funding the Next Generation of Health IT Researchers

AHRQ continues to fund doctoral candidates to promote and build research capacity in the use of health IT to improve healthcare quality, safety, efficiency, and effectiveness.

***Use of Electronic Personal Health Records as a Health Risk-Reduction Discussion Tool (eSHINE Study) (Grant # R36 HS 023057)*:** The dissertation work of Kevon-Mark Jackman examined the use of personal health records (PHRs) among black youth as a risk-reduction tool for HIV and other sexually transmitted infections. This study found PHRs may serve as a digital health tool for individuals to overcome barriers and initiate conversations with partners about sexual health. One of the most significant findings was that participants with unhealthy practices, primarily those who had not practiced risk discussions, believed that PHRs would encourage conversations with partners about risk and testing before sex. PHRs could create a platform for the mutual exchange of information, and although they may not remove the awkwardness of having the conversation, they are believed to make them easier.

More information on these and other projects may be found on the AHRQ Health IT Projects' website, where success stories, videos, and podcasts highlighting many of the projects are available.

B. Publicizing Grantee and Contractor Outputs

The Health IT grantees and contractors publicize their research findings in many ways, such as participating in AHRQ's 2016 Research Summit, publishing work in peer-reviewed journals, and making presentations to stakeholder groups and at other health- and IT-based conferences. AHRQ has developed an AHRQ Health IT Projects Publication Database to further disseminate work of the funded projects. This Publication Database is updated on a quarterly basis via literature search and by notification from funded grantees and contractors of published work.

During 2016, there were a total of 124 peer-reviewed publications and final contract project reports published that were identified through the literature search and the notification system.

Publications

Highlights from the Health IT funded projects' publications include the following:

Comparison of Approaches for Heart Failure Case Identification from Electronic Health Record Data. Dr. Saul Blecker and his colleagues at the New York University School of Medicine are developing and testing a clinical decision support tool to identify hospitalized patients with heart failure, regardless of their reason for hospitalization (Grant # HS 023683). By identifying these patients in real time, they can be targeted for interventions to improve outcomes. While problem lists are one source of identification, those lists are frequently inaccurate or incomplete. This retrospective study compared five algorithms for heart failure identification using data from problem lists versus machine learning using free text in the EHR. Utilization of the problem list was found to be insufficient, while machine learning was found to have high predictive accuracy. The authors concluded that the utilization of machine learning techniques can improve outcomes for patients with heart failure.

Characterizing the Pain Score Trajectories of Hospitalized Adult Medical and Surgical Patients: A Retrospective Cohort Study. Dr. Bruce Lambert and a team of investigators from Northwestern University are developing a web-based simulator to train prescribers in the proper selection and dosing of opioids (Grant # HS 021093). As part of the project, the researchers conducted a retrospective, observational study to characterize pain trajectories of hospitalized adults during the first 48 hours of admission. Associated pain scores and sociodemographics were assessed, as well as pain medication orders and the hospital service. The study found that pain trajectories were different based on race, gender, service, and initial pain score. Those with higher pain on admission experienced more rapid reductions during the first 2 hours of treatment. Regardless of level of initial pain, pain was reduced by approximately 50 percent at 48 hours following admission. Of note, the pain of most patients failed to fully resolve. The authors concluded that the use of graphical pain trajectories may yield new understanding of pain and provide information about the experience of pain that is relevant to patients and their providers.

Presentations

Grantees presented project-related findings and activities at AHRQ's 2016 Research Summit, which took place on September 18, 2016, in Rockville, Maryland. This Research Summit, titled "Improving Diagnosis in Healthcare," brought together AHRQ staff and other stakeholders to: explore the current state of diagnosis in healthcare; discuss ways researchers can contribute to a collaborative approach to improving diagnostic performance; and identify the research, tools, training, data, and measures that are needed to improve diagnostic performance. Drs. Pascale Carayon, Hardeep Singh, and Jason Adelman presented information from their AHRQ-funded work. More information on the Research Summit and the presentations is available at https://www.ahrq.gov/news/events/ahrq-research-summit-diagnostic-safety.html.

IV. Conclusion

The work funded by the AHRQ Health IT Division has identified challenges to health IT adoption and use, solutions and best practices for making IT work in real world healthcare delivery settings, and tools that will help providers incorporate new IT successfully. In addition, many of the active projects focus on how patient-facing technologies can best improve the quality and effectiveness of care, use of mobile health to facilitate the dissemination and implementation of findings from PCOR into clinical practice, and how to design and implement EHRs that are more intuitive to use and more readily support clinical workflow. These projects have made important contributions to the field of health IT and further the evidence base regarding the impact of health IT on healthcare quality. Ultimately, the work produces field-leading research and summarizes evidence to inform future decisions about health IT by healthcare stakeholders and policymakers.

Findings and lessons learned are shared through the AHRQ Health IT website. Readers are invited to visit the website to learn more about all of the AHRQ resources, initiatives, and funded projects.

V. List of Projects Active in 2016

Table 11: Health Information Technology PA Grants

Small Research Grants to Improve Health Care Quality Through Health IT (R03)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Stablein, Timothy	The Role of Privacy in Practice: Electronic Health Records in Pediatrician Interactions with Patients	PAR-HS-08-268
Exploratory and Developmental Grant to Improve Health Care Quality Through Health IT (R21)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Adelman, Jason Stuart	Assess Risk of Wrong Patient Errors in an Electronic Medical Record that Allows Multiple Records Open	PA-14-001
Anderson, Heather	Integrating Patient-Reported Outcomes and Electronic Health Record Data to Improve Clinical Decision Support for Depression Treatment	PAR-HS-08-269
Asan, Onur	Perception and Use of a Patient Care Window to Improve Care and Family Engagement	PA-14-001
Bardach, Naomi S.	Novel Information Technology to Create Patient-Integrated Quality Improvement	PA-14-001
Bauer, Nerissa San Luis	Improving Anxiety Detection in Pediatrics Using Health Information Technology	PA-14-001
Beebe, Lora	The Long-Term Effectiveness of Telephone Intervention Problem Solving (TIPS)	PAR-HS-08-269
Cartmell, Kathleen Buford	Reducing Hospital Readmission Rates by Implementing an Inpatient Tobacco Cessation Service Driven by Interactive-Voice Recognition Technology	PA-14-001
Chaudhry, Rajeev	Natural Language Processing-Enabled Decision Support for Cervical Cancer Screening and Surveillance	PAR-HS-08-269
Choi, Sung	Personalized Engagement Tool for Pediatric Blood and Marrow Transplantation Patients and Caregivers	PA-14-001
Cohen, Lindsey	Relieving Anxiety in Children Undergoing Radiation Therapy through Virtual Preparation	PAR-HS-08-269
Cutrona, Sarah Leleiko	Open & Act: Tracking Healthcare Team Response to Electronic Health Record Asynchronous Alerts	PA-14-001
Dalal, Anuj K.	Interactive Patient-Centered Discharge Toolkit to Promote Self-Management During Transitions	PA-14-001
Dexheimer, Judith W.	Optimal Methods for Notifying Clinicians About Epilepsy Surgery Patients	PA-14-001

Exploratory and Developmental Grant to Improve Health Care Quality Through Health IT (R21)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Dorsch, Michael	A Geofencing-Based Adaptive Messaging System to Support Patient Self-Management of a Low-Sodium Diet in Hypertension	PA-14-001
Dowding, Dawn	Development of Dashboards to Provide Feedback to Home Care Nurses	PA-14-001
Farris, Karen	Improving Adherence and Outcomes by Artificial Intelligence-Adapted Text Messages	PAR-HS-08-269
Federman, Alex D.	Development of an Electronic Medical Record-Integrated Enhanced After Visit Summary	PA-14-001
Ferucci, Elizabeth D.	Evaluation of the Impact of Telemedicine on Management of Rheumatoid Arthritis	PA-14-001
Gance-Cleveland, Bonnie	StartSmart™: Health Information Technology to Improve Adherence to Prenatal Guidelines	PA-14-001
Goss, Foster R.	Natural Language Processing to Identify and Rank Clinically Relevant Information for EHRs in the Emergency Department	PA-14-001
Gray, Stacy W.	Empowering Cancer Patients Through Innovations in Information Technology-Based Reporting of Precision Medicine	PA-14-001
Hewner, Sharon	Coordinating Transitions: Health Information Technology Role in Improving Multiple Chronic Disease Outcomes	PAR-HS-08-269
Juckett, David	Phenotype Modeling and Outcome Mapping for Pain Management Decision Support	PAR-HS-08-269
Kazemi, Donna	mHealth Delivery of a Motivational Intervention to Address Heavy Drinking Among College Freshmen	PA-14-001
Kent, K Craig	Patient-Centered Postoperative Wound Surveillance Using Current Technology	PAR-HS-08-269
Kutney-Lee, Ann	Electronic Health Record Use, Work Environments, and Patient Outcomes	PA-14-001
Lacson, Ronilda	Automated Notification for Follow-Up Testing Recommendations Across Care Settings	PAR-HS-08-269
Lee, Joyce	Patient-Centered Data Visualizations for Diabetes	PA-14-001
Leung, May May	Intervention INC: Interactive Nutrition Comics for Urban Minority Youth	PA-14-001
Levin, Scott Ryan	HopScore: An Electronic Outcomes-Based Emergency Triage System	PA-14-001
Lindquist, Lee A.	Improving Outpatient Safety of Older Adults through Electronic Patient Portals	PA-14-001
Liss, David T.	Using Location-Based Smartphone Alerts Within a System of Care Coordination	PA-14-001

Exploratory and Developmental Grant to Improve Health Care Quality Through Health IT (R21)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Malone, Daniel C.	Individualized Drug Interaction Alerts	PA-14-001
Mazur, Lukasz	Enhancing Providers Ability to Follow-up on Abnormal Test Results	PA-14-001
McAlearney, Ann Scheck	Portals in Inpatient Care (PIC): Evaluating the Usability, Use and Patient Experience Associated with Patient Portal Technology at the Bedside	PA-14-001
Meguid, Robert A.	Surgical Risk Preoperative Assessment System (SURPAS)	PA-14-001
Mitchell, Suzanne	Treating Comorbid Depression During Care Transitions with Relational Agents	PA-14-001
Molfenter, Todd David	Payer Readiness for Technology Implementation (P-RTI) Tool Application and Assessment	PA-14-001
Morrow, Daniel	Collaborative Patient Portals: Computer-Based Agents and Patients	PAR-HS-08-269
Munson, Sean	Sharing Patient Lifelog Data with the Primary Care Team for Two Patient Populations: Preventative Care and Chronic Disease Management	PA-14-001
Nahm, Eun-Shim	A Theory-Based Patient Portal eLearning Program for Older Adults with Chronic Illnesses	PA-14-001
Ornstein, Steven	Learning From Primary Care EHR Exemplars About Health IT Safety	PA-14-001
Overby, Casey	Electronic Health Record-linked Decision Support for Communicating Genomic Data	PAR-HS-08-269
Patel, Minal R.	Feasibility of a Clinician Training Program to Improve Patient-Provider Communication in the Presence of Health Information Technology Systems in the Exam Room	PA-14-001
Payne, Thomas H.	Improving Accuracy of Electronic Notes Using a Faster, Simpler Approach	PA-14-001
Phillips, Robert	Trial of Aggregate Data Extraction for Maintenance of Certification and Raising Quality	PAR-HS-08-269
Pratap, Jayant	Using the Electronic Health Record to Identify Children Likely to Suffer Last-Minute Surgery Cancellation	PA-14-001
Primack, Brian A.	Sponsored Health Information Technology and Evidence-Based Prescribing among Medical Residents	PAR-HS-08-269
Rangachari, Pavani	Using Social Knowledge Networking (SKN) Technology to Enable Meaningful Use of EHR Technology	PA-14-001
Rao, Goutham	Improving Diagnosis of Hypertension in Children (IDHC)	PA-14-001

Exploratory and Developmental Grant to Improve Health Care Quality Through Health IT (R21)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Schnipper, Jeffrey Lawrence	Electronic Medication Adherence Reporting and Feedback During Care Transitions	PA-14-001
Sherwin, Robert	Enhancing an EMR-Based Real-Time Sepsis Alert System Performance Through Machine Learning	PA-14-001
Shorten, Allison	Using Interactive Health Information Technology to Support Women's Choices for Birth After Cesarean	PAR-HS-08-269
Singh, Hardeep	Improving Direct Notification of Abnormal Test Results via Patient Portals	PA-14-001
Snyder, Margie E.	Enhancing Clinical Decision Support Applications for Community Pharmacist-Delivered Medication Therapy Management	PA-14-001
Valdez, Rupa	Accessibility and Beyond: Designing Consumer Health Information Technology for Disabled Individuals	PA-14-001
Wernz, Christian	Evidence-based Contingency Planning for Electronic Health Record Downtime	PA-14-001
Ye, Lichuan	A Sleep Promotion Toolkit for Hospitalized Patients	PA-14-001
Yen, Po-Yin	Development and Evaluation of Sociotechnical Metrics to Inform Health IT Adaptation	PA-14-001

Disseminating and Implementing Evidence from Patient-Centered Outcomes Research in Clinical Practice Using Mobile Health Technology (R21)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Abujarad, Fuad	Patient Centered Virtual Multimedia Interactive Informed Consent (VIC)	RFA-HS-14-010
Bajaj, Jasmohan S.	Use of Patient Buddy Application to Disseminate Knowledge & Prevent Readmission	RFA-HS-14-010
Chrischilles, Elizabeth	Design and Testing of a Mobile Cardiovascular Risk Service with Patient Partners	RFA-HS-14-010
Connelly, Mark Andrew	Registry-Assisted Dissemination of Mobile Pain Management for Youth with Arthritis	RFA-HS-14-010
Oreskovic, Nicolas M	An Integrated Closed-Loop Feedback System for Pediatric Cardiometabolic Disease	RFA-HS-14-010
Rudin, Robert Samuel	Using mHealth and Patient-reported Outcomes to Deliver Evidence-Based Asthma Care	RFA-HS-14-010
Schnall, Rebecca	Use of mHealth Technology for Supporting Symptom Management in Underserved Persons Living with HIV	RFA-HS-14-010

Disseminating and Implementing Evidence from Patient-Centered Outcomes Research in Clinical Practice Using Mobile Health Technology (R21)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Shah, Nirmish R.	Use of Mobile Technology to Improve Acute Care Utilization in Sickle Cell Disease	RFA-HS-14-010
Tubb, Matthew Robert	A Mobile App to Enhance Smoking Cessation Shared Decision Making in Primary Care	RFA-HS-14-010
Tulu, Bengisu	TJR Guru: A Mobile App for Shared Informed Decision Making in Total Joint Replacement Surgery	RFA-HS-14-010
Utilizing Health IT to Improve Health Care Quality (R18)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Fricton, James	Decision Support to Improve Dental Care for Medically Compromised Patients	PAR-HS-08-270
Haas, Jennifer	Health Information Technology Enhanced Family Health History Documentation and Management in Primary Care	PAR-HS-08-270
Hess, Rachel	Functional Assessment Screening Patient Reported Information: FAST-PRI	PAR-HS-08-270
Understanding Clinical Information Needs and Health Care Decision Making Processes in the Context of Health IT (R01)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Agha, Zia	Quantifying Electronic Medical Record Usability to Improve Clinical Workflow	PA-11-198
Butler, Keith	Modeling and Analysis of Clinical Care for Health Information Technology Improvement	PA-11-198
Carayon, Pascale	Health Information Technology-Supported Process for Preventing and Managing Venous Thromboembolism	PA-11-198
Cohen, Deborah Jill	Clinical Information Needs of Community Health Centers for Health Information Technology (CLINCH-IT)	PA-11-198
Fairbanks, Rollin	Cognitive Engineering for Complex Decision Making and Problem Solving in Acute Care	PA-11-198
Flum, David R.	Developing Design Principles to Integrate Patient-Reported Outcomes (PROs) into Clinical Practice through Health Information Technology: Data, User Experience, and Workflow Requirements for PRO Dashboards	PA-11-198
Franklin, Amy	Opportunistic Decision Making Information Needs and Workflow in Emergency Care	PA-11-198
Gold, Jeffrey Allen	Electronic Health Record Solutions for Accurate Reporting of Data on Interprofessional Intensive Care Unit Rounds	PA-11-198

Understanding Clinical Information Needs and Health Care Decision Making Processes in the Context of Health IT (R01)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Gurses, Ayse Pinar	Care Transitions and Teamwork in Pediatric Trauma: Implications for Health Information Technology Design	PA-11-198
Harle, Christopher Albert	Designing User-Centered Decision Support Tools for Chronic Pain in Primary Care	PA-11-198
Koopman, Richelle J.	Optimizing Display of Blood Pressure Data to Support Clinical Decision Making	PA-11-198
Manojlovich, Milisa	The Effect of Health Information Technology on Healthcare Provider Communication	PA-11-198
Melton-Meaux,	Discovery and Visualization of New Information from Clinical Reports in the Electronic Health Record	PA-11-198
Singh, Hardeep	Decision Making and Clinical Work of Test Result Follow-up in Health Information Technology Settings	PA-11-198
Wetterneck, Tosha Beth	Understanding Primary Care Teamwork in Context: Implications for Health Information Technology Design	PA-11-198
Windle, John	Optimizing the Electronic Health Record for Cardiac Care	PA-11-198

Understanding User Needs and Context to Inform Consumer Health IT Design (R01)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Arcury, Thomas	Maximizing the Impact of Electronic Personal Health Information Management (ePHIM) in Low-Income, Multiethnic Populations	PA-11-199
Jackson, Gretchen P.	Personal Health Information Needs and Practices for Maternal Fetal Care	PA-11-199
Matthews, Judith T.	Self-Management via Health Kiosk by Community-Residing Older Adults	PA-11-199
Ponto, Kevin	vizHOME: A Context-Based Health Information Needs Assessment Strategy	PA-11-199
Pratt, Wanda	Patients as Safeguards: Understanding the Information Needs of Hospitalized Patients	PA-11-199
Ralston, James	Patient Reminders and Notifications	PA-11-199
Ralston, James	Understanding and Honoring Patients with Multiple Chronic Conditions	PA-11-199
Safran, Charles	InfoSage: Information Sharing Across Generation and Environments	PA-11-199
Thompson, Haley S.	eHealth Activity among African American and White Cancer	PA-11-199

Understanding User Needs and Context to Inform Consumer Health IT Design (R01)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Turner, Anne M.	Addressing the Personal Health Information Management Needs of Older Adults	PA-11-199
Vawdrey, David Kent	Addressing Hospital Patient Information Needs Using a Personal Health Record Portal	PA-11-199
Zikmund-Fisher, Brian	Systematic Design of Meaningful Presentations of Medical Test Data for Patients	PA-11-199
Active Aging: Supporting Individuals and Enhancing Community-based Care Through Health IT (P50)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Gustafson, David H.	Bringing Communities and Technology Together for Healthy Aging	RFA-HS-10-016
Patient-Centered Outcomes Research Clinical Decision Support Leaning Network (U18)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Blumenfeld, Barry H.	Patient-Centered Outcomes Research Clinical Decision Support Learning Network	HS-15-003
Electronic Data Methods Forum: Second Phase (U18)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Edmunds, Margaret	AcademyHealth Electronic Data Methods Forum Second Phase	RFA-HS-13-004

Table 12: Other Health IT Funded Grants

AHRQ Conference Grant Program (R13)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Fridsma, Douglas Brian	AMIA Health Policy Conference	PA-13-017
Gill, Erica L.	e3iVR: Conference on Ethics in Investigational and Interventional Uses of Immersive Virtual Reality	PA-13-017
Career Development (K01, K08) and Dissertation (R36) Grants Focused on Health IT		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Anker, Jessica	Improving Healthcare Quality with User-Centric Patient Portals	PAR-09-087
Blecker, Saul B.	Health Information Technology in Heart Failure Care	PA-13-039
Cohen, Genna Rebecca	Physician Practice Variation in Electronic Health Record Use	PA-12-256
Gephart, Sheila Maria	Clinical Decision Support Optimizing Necrotizing Enterocolitis Prevention Implementation in Neonatal Intensive Care Unit	PA-13-039
Jackman, Kevon-Mark Phillip	Use of Electronic Personal Health Records as a Health Risk-Reduction Discussion Tool	PA-12-256
Melnick, Edward	Clinical Decision Support for Mild Traumatic Brain Injury	PAR-09-085
Nanji, Karen C.	Preventing Perioperative Medication Errors and Adverse Drug Events Through the Use of Clinical Decision Support	PA-13-039
Smith, Angela B.	Developing an Interactive, Patient-Centered mHealth Tool to Enhance Post-Cystectomy Care	PA-13-039
Wasson, Lauren	Improving Diagnosis of Cardiovascular Disease in the Emergency Department Using Cognitive Informatics Tools	PA-13-039
Wen, Kuang-Yi	MyHealthPortal: Using an Electronic Portal to Empower Patients with Breast Cancer	PAR-09-087
Patient Centered Outcomes Research Pathway to Independence Award (K99/R00)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Lyles, Courtney	Engaging Diverse Patients in Using an Online Patient Portal	RFA-HS-13-002

Patient Centered Outcomes Research Mentored Clinical Investigator Award (K08)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Sharifi, Mahnoos H.	Using Electronic Health Records to Support Decision-Making in Pediatric Obesity Care	PA-13-180
Small Research Grant Program (R03)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Mendonca, Eneida	Virtualized Homes: Tools for Better Discharge Planning	PA-15-147
Saleem, Jason J.	Ambulatory Clinic Exam Room Design with Respect to Computing Devices to Enhance Patient Centeredness	PA-15-147
AHRQ Health Services Research Demonstration and Dissemination (R18)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Conroy, Margaret	Maintaining Activity and Nutrition through Technology-Assisted Innovation in Primary Care	PA-09-071
Epstein, Jeff N.	Improving ADHD Behavioral Care Quality in Community-Based Pediatric Settings	PA-14-290
Kroth, Philip	Minimizing Stress, Maximizing Success of Physician's Use of Health Information	PA-13-046
AHRQ Health Services Research Projects (R01)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Adelman, Jason Stuart	Develop and Validate Health Information Technology Safety Measures to Capture Violations of the Five Rights of Medication Safety	PA-14-291
Alpern, Elizabeth	Improving the Quality of Pediatric Emergency Care Using an Electronic Medical Record Registry and Clinician Feedback	PA-09-070
Bates, David	Ensuring Safe Performance of Electronic Health Records	PA-13-045
Cummins, Mollie Rebecca	Electronic Exchange of Poisoning Information	PA-09-070
Dixon, Brian	Improving Population Health Through Enhanced Targeted Regional Decision Support	PA-09-070
Gilbert, Amy	Computer-Supported Management of Medical-Legal Issues Impacting Child Health	PA-09-070

AHRQ Health Services Research Projects (R01)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Lambert, Bruce	Preventing Wrong-Drug and Wrong-Patient Errors with Indication Alerts in Computerized Provider Order Entry Systems	PA-14-291
McCarty, Carolyn A.	Improving Teen Care with Health Information Technology	PA-13-045
Patel, Vimla L.	Impact of Meaningful Use on Clinical Workflow in Emergency Departments	PA-13-045
Post, Lori	Emergency Department Disability Diagnostic Tool: A Health Information Technology Feasibility Study	PA-09-070
Ratwani, Raj M.	Developing Evidence-based User Centered Design and Implementation Guidelines to Improve Health Information Technology Usability	PA-14-291
Schiff, Gordon David	Enhancing Medication Computerized Provider Order Entry Safety and Quality by Indications Based Prescribing	PA-13-045
Schnall, Rebecca	The Wise App Trial for Improving Health Outcomes in People Living With HIV (PLWH)	PA-14-291
Senathirajah, Yalini	Finding the Safer Way: Novel Interaction Design Approaches to Health Information Technology Safety	PA-14-291
Shapiro, Jason S.	Advancing Quality Measurement and Care Improvement with Health Information Exchange	PA-09-070
Siegel, Corey	Evaluating a Prediction Tool and Decision Aid for Patients with Crohn's Disease	PA-09-070
Sockolow, Paulina	Information Needs of Homecare Nurses During Admission and Care Planning	PA-14-291
Stockwell, Melissa	PRISM: Personalized Reminders for Immunizations using Short Messaging Systems	PA-13-045
Stockwell, Melissa	SINC: Synchronized Immunization Notifications	PA-14-291
Vest, Joshua Ryan	Use of Push and Pull Health Information Exchange Technologies by Ambulatory Care Practices and the Impact on Potentially Avoidable Health Care Utilization	PA-14-291
Yellowlees, Peter M.	A Clinical Trial to Validate an Automated Online Language Interpreting Tool with Hispanic Patients Who Have Limited English Proficiency	PA-14-291
Zhou, Li	Natural Language Processing to Improve Accuracy and Quality of Dictated Medical Documents	PA-14-291
Zhou, Li	Encoding and Processing Patient Allergy Information in Electronic Health Records	PA-13-045

Centers for Education and Research on Therapeutics (CERTs) (U19)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Bates, David	Health Information Technology Center for Education and Research on Therapeutics	RFA-HS-11-004
Lambert, Bruce	Tools for Optimizing Medication Safety (TOP-MEDS)	RFA-HS-11-004

Research Centers in Primary Care Practice-Based Research and Learning (P30)		
Principal Investigator	**Project Title**	**Funding Opportunity Announcement**
Fiks, Alexander	National Center for Pediatric Practice Based Research and Learning	RFA-HS-12-002
Ornstein, Steven	Research Centers in Primary Care Practice Based Research and Learning	RFA-HS-12-002

Table 13: Health IT Contracts and Interagency Agreements

Health IT Contracts and Interagency Agreements		
Organization	**Project Title**	**Contract/IAA Number**
National Science Foundation	Advancing Health Services through System Modeling Research	12-689F-12
The MITRE Corporation	Patient-Centered Outcomes Research Clinical Decision Support Prototype Development and Dissemination	290-16-00001U

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