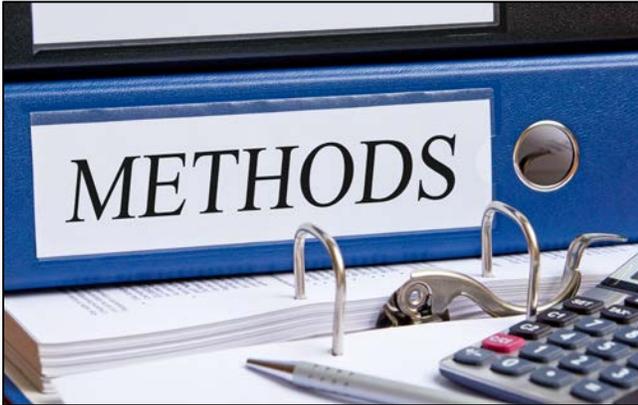


PRACTICE-BASED RESEARCH NETWORKS: *Innovative Research Methods*

EVALUATION, ENGAGEMENT, AND PRACTICE IMPROVEMENT

The dedication of skilled researchers and access to a diverse patient population seeking care in routine practice settings uniquely allows the [Practice-based Research Network](#) (PBRN) community to pioneer the use of new and emerging research methods in real-world settings. These methodologies include conducting pragmatic clinical trials, implementing practice and quality improvement efforts, developing tools, and participating in rapid cycle research, among others. This summary highlights PBRNs that are pioneering innovative methods in their research



Summary Highlights:

- PBRNs are the ideal setting to implement innovative evidence-based research methods, such as [Practice Facilitation](#), that can improve health, well-being, and patient safety.
- PBRNs are pioneering the development of methods, such as [Pragmatic Research](#), to best meet the needs of the PBRN community.
- Research being done by PBRNs has led to important findings and development of tools such as [PRECIS](#).
- The AHRQ PBRN Resource Center sponsors training Webinars focused on specific research methodologies, such as [RE-AIM](#) and the [Stepped Wedge Design](#).

Improving the Quality of Care

Quality improvement (QI) methods consist of systematic and continuous actions that lead to measurable and sustained improvement in health care services and the health status of targeted patient groups. QI approaches use data-based methods to bring about immediate improvements in health care delivery at the practice level. Although there are numerous QI models, the basic principles are universal: focus on patient outcomes, team-based solutions, and data as cornerstones of all activities. The PBRN community has embraced QI methods as evidenced by the studies highlighted below.

Primary (Care) Practices Research Network ([PPRNet](#))

[Integration and Sustainability of Alcohol Screening, Brief Intervention, and Pharmacotherapy in Primary Care Settings](#): This study reports the impact of dissemination of a practice-based quality improvement approach (Practice Partner Research Network-Translating Research into Practice [PPRNet-TRIP]) on alcohol screening, brief intervention for at-risk drinking and alcohol use disorders, and medications for alcohol use disorders in primary care practices. Nineteen primary care practices from 15 states representing 26,005 patients with diabetes and/or hypertension participated in a group-randomized trial (early intervention vs. delayed intervention). The 12-month intervention consisted of practice site visits for academic detailing and

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participatory planning and network meetings for "best practice" dissemination. The study found early intervention significantly increased the odds of screening and brief intervention receipt, and this improvement was maintained after the intervention period.

WWAMI Region Practice and Research Network ([WPRN](#))

[Developing a practice-based research network by integrating quality improvement: challenges and ingredients for success](#):

This article describes the challenges and strengths illuminated by the conduct of a combined research/QI study in a nascent PBRN. Challenges included the study's exclusion of clinic patients who might have benefited from the intervention, the QI program's less uniformed approach to intervention implementation, and the need for both academic and clinically relevant products and publications. A major strength was the increased likelihood of both engaging clinical practices in research and developing successful clinical interventions. Required elements for success include identification of enthusiastic clinical research "champions;" involvement of researchers with clinical experience; and adequate funding to support research, clinical resources, and dissemination.

The practice's mission is to serve the patients; anything we can do to help support that, while keeping clinicians engaged and interested in the research process, serves everyone.

*Gina Keppel, MPH
Coordinator, WPRN*

Practice Transformation Through Practice Facilitation

In the [CoCoNet2 P30 Center for Primary Care Practice-based Research and Learning](#) all member networks employ practice

facilitators (PF) in their clinics. Practice facilitation helps improve processes and outcomes by creating a sustained relationship between an external change agent and the primary care practice team. PFs help practices grow and improve care through audits and feedback, staff training, sharing innovative ideas, supporting system and infrastructure development, and coordinating QI activities.

"UNYNET is instrumental in assembling practice facilitator experts from across the country to guide, direct, and contribute to the materials in the Practice Facilitator Professional Development and Training Program."

*Chester H. Fox, MD,
University at Buffalo, UNYNet*

Training Program

A national [Practice Facilitator Professional Development and Training Program](#) was developed, disseminated, and implemented through a partnership of several CoCoNet2 members. The certified program consists of lectures, virtual group discussions, presentations by national experts, and a preceptorship that allows trainees to gain practical experience at facilities around the country. Program graduates help practices establish methods, processes, and infrastructure leading to measurable improvements in service delivery.

Handbook

Lyndee Knox, the director of CoCoNet2 member PBRN LANet, has worked extensively with AHRQ to develop the [Practice Facilitation Handbook](#). It is designed to assist a clinic or network director in developing, administering, and maintaining a practice facilitation program to make meaningful practice changes and improve patient outcomes.

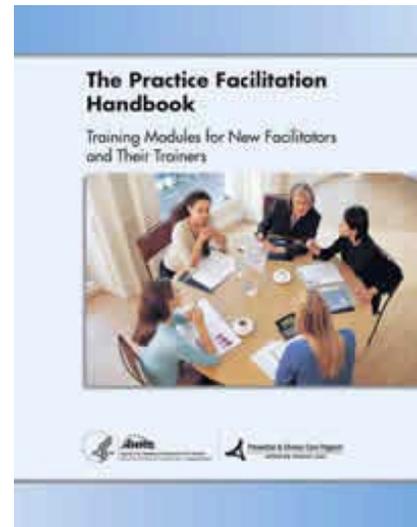


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Helpful resources related to Practice Facilitation:

-  [Frontline Innovation Video: Practice Enhancement Assistants](#) from the AHRQ Innovations Exchange
- [Implementing the Patient Centered Medical Home: Practice Facilitation How-To Guide](#) from AHRQ
-  [Practice Facilitation Webinars](#) from AHRQ
-  Webinar on [Exemplar Primary Care Practice Facilitation Training Programs](#), featuring Dr. Knox, LA Net

AHRQ Practice Facilitation Handbook



Pragmatic Clinical Trials

PBRNs are uniquely positioned to conduct research in real-life patient settings. As a result, the implementation of pragmatic clinical trials has flourished in PBRN communities. Traditional explanatory clinical trials aim to test whether an intervention works under optimal situations. In contrast, pragmatic trials are designed to evaluate the effectiveness of interventions in real-life routine practice conditions.

Pragmatic trials produce results that can be generalized and applied in routine practice settings. The following studies highlight this cutting edge research design method being conducted by the PBRN community. To learn more about this method, visit the [PBRN Pragmatic Research and Translation Learning Group](#) page on the PBRN Web site. Three members of the PBRN community, Rowena Dolor, Jonathan Tobin, and Paul Meissner, lead this group. The work focuses on PBRN engagement in pragmatic trials and practical strategies for translation of research into practice.

The future of PBRN research will involve increased collaboration amongst multiple networks and the continued use and advancement of the science around pragmatic clinical trials and mixed methods approaches.

*Jennifer Carroll, MD
Director, AAFP NRN*

AAFP National Research Network (AAFP NRN)
[Communication is the Key to Success in Pragmatic Clinical Trials in Practice-based Research Networks \(PBRNs\)](#): In this article, AAFP NRN researchers discuss their experiences in conducting large scale pragmatic trials in the PBRN setting. Based on their experiences, the authors believe communication to be the key to success in these kinds of trials. The authors review two studies in depth and share their successes as well as lessons learned. The article

includes a table of tools to facilitate communication in PBRN studies.



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Duke Primary Care Research Consortium (PCRC), Virginia Ambulatory Care Outcomes Research Network (ACORN), AAFP National Research Network (AAFP NRN), Upstate New York Practice Based Research Network (UNYNET) & WWAMI Region Practice and Research Network (WPRN)

[Guidance for Researchers Developing and Conducting Clinical Trials in Practice-based Research Networks \(PBRNs\)](#)

Members of five diverse PBRNs provide guidance for the PBRN community around developing and conducting pragmatic clinical trials in primary care. The authors pose solutions for common challenges faced by PBRN researchers and personnel in implementing these kinds of trials. Challenges were identified by members of the PBRN community at a 2013 AHRQ-sponsored PBRN conference. The resulting guidance has been compiled into a toolkit available on the [DARTNet Web site](#).

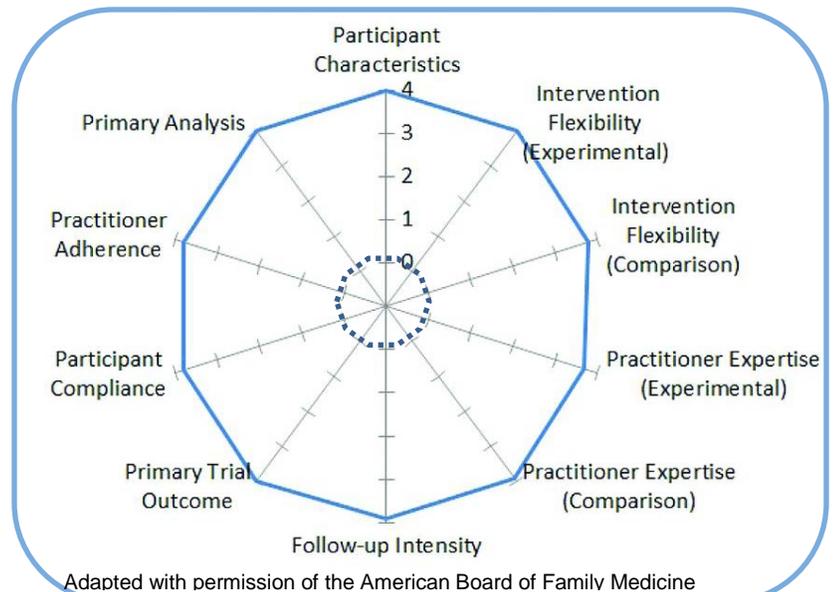
Duke Primary Care Research Consortium (PCRC)

[PROspective Multicenter Imaging Study for Evaluation of chest pain: rationale and design of the PROMISE trial:](#)

The PROMISE study is an ongoing prospective, randomized trial comparing the effectiveness of two initial diagnostic strategies in patients with symptoms suspicious for coronary artery disease (CAD). Over 3.2 years, more than 10,000 symptomatic subjects at 193 sites received either functional testing (exercise electrocardiogram, stress nuclear imaging, or stress echocardiogram) or anatomical testing with ≥ 64 -slice multidetector coronary computed tomographic angiography for CAD. Quality of life, resource use, cost-effectiveness, and radiation exposure were assessed. The PROMISE Trial showed similar numbers of clinical outcomes (death, heart attacks, or other serious heart events) after receiving either CTA or traditional stress testing. CTA may be better at reducing the need for more tests and procedures in patients who do not have heart disease, plus CTA involved a lower dose of

radiation compared to a stress nuclear study. In general, patients should work with their doctors to determine the best test for them.

The **pragmatic-explanatory continuum indicator summary (PRECIS)** tool is a graphical depiction of 10 domains that help researchers determine whether their clinical trial is pragmatic or explanatory. This tool can help researchers ensure that their design decisions are consistent with the stated purpose of the trial. The studies provided below describe the use of this tool by PBRN researchers.



The outer circle represents a completed PRECIS wheel for a trial that is more pragmatic, as each domain is rated closer to a 4 on the continuum of explanatory (0) to pragmatic (4). The inner circle represents a PRECIS wheel for a trial that is more explanatory in nature.

In December 2014, the AHRQ PBRN Resource Center sponsored a Webinar on the PRECIS Tool: [PRECIS Tool: Understanding your Research Intentions, the Pragmatic-Explanatory Continuum](#) 



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Virginia Ambulatory Care Outcomes Research Network ([ACORN](#)) & OCHIN Practice-based Research Network ([OCHIN](#))

[Designing a valid randomized pragmatic primary care implementation trial: The My Own Health Report \(MOHR\) project](#): This paper reports on the iterative design of the MOHR study, a cluster randomized delayed intervention trial. The MOHR study shows how a participatory design can be used to promote the consistent collection and use of patient-reported health behavior and psychosocial assessments in a broad range of primary care settings. While pragmatic in nature, the study design will allow valid comparisons to answer the posed research question, and findings will be broadly generalizable to a range of primary care settings. Per the pragmatic explanatory continuum indicator summary (PRECIS) framework, the study design is substantially more pragmatic than other published trials. The methods and findings should be of interest to researchers, practitioners, and policymakers attempting to make health care more patient-centered and relevant.

Kentucky Ambulatory Network ([KAN](#))

[Using the Pragmatic-Explanatory Continuum Indicator Summary \(PRECIS\) model in clinical research: Application to refine a practice-based research network \(PBRN\) study](#): The authors recently completed a pilot study examining health-related outcomes for 2 complementary therapies for chronic low back pain in patients referred by primary care providers in the Kentucky Ambulatory Network. In preparation for a larger study, the investigators sought to characterize the pragmatic features of the study to aid in design decisions. The study team conducted a presentation to experienced researchers at the University of Kentucky to examine the study methodologies of parameters suggested by the PRECIS model. The study was not as pragmatic as expected; however, the authors conclude that the exercise results seem to be useful in identifying necessary refinements to the study methodology that may benefit future study design and increase generalizability.

Working with Institutional Review Boards



PBRNs strive to maximize utilization of resources and often partner to increase the efficiency of researching, developing, and implementing new methods. Working with an Institutional Review Board (IRB) can be a time consuming step of any research project. AHRQ hosted a September 2014 [Webinar focusing on various types of IRB cooperation](#) that can support practice-based research. Presenters described processes for ceding review to a lead IRB, serving as the IRB of record, and participating in [Ohio's Reliant IRB](#) review, and they gave examples of how PBRNs have successfully implemented these strategies in research. Researchers hope that IRB processes will become more streamlined in order to support cooperative research projects.

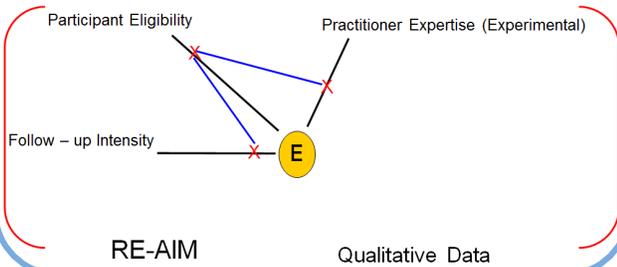
Other Methods

Given their unique practice-based setting, PBRNs continue to pioneer innovative research methodologies and analytic methods. These methods include the Stepped Wedge Design and RE-AIM. To further these efforts, AHRQ's PBRN Resource Center has developed training Webinars to introduce these methodologies widely across the PBRN community.



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Combining RE-AIM and PRECIS



In May 2015, the PBRN Resource Center hosted a Webinar on the PRECIS and RE-AIM frameworks: [How pragmatic is it? Lessons learned using PRECIS and RE-AIM for determining pragmatic characteristics of research](#)

The New York City Research and Improvement Networking Group ([NYC RING](#))

[Implementation of a pilot primary care lifestyle change intervention for families of pre-school children: lessons learned](#)

Investigators used the RE-AIM framework to evaluate the feasibility of a primary care-based intervention to decrease behaviors that place urban children at risk for obesity. During primary care visits for 2- to 5-year-olds, parents completed a health behavior assessment. Primary care providers engaged parents in brief goal setting and referred them to a lifestyle counselor. The intervention was adopted by 14 of 17 clinicians. The health assessment was implemented in 32% of preventive visits (N=354). Of those, goal setting by physicians occurred in 59%, with 55% referred to the

lifestyle counselor. Although the authors were unable to demonstrate effectiveness to change adult or child nutrition or physical activity, they conclude that goal setting with referral for more intensive lifestyle counseling for obesity prevention in high risk families is feasible and acceptable in primary care.

San Francisco Bay Collaborative Research Network ([SF Bay CRN](#))

[Quasi-experimental trial of diabetes Self-Management Automated and Real-Time Telephonic Support \(SMARTSteps\) in a Medicaid managed care plan](#)

After a randomized controlled trial of a multilingual automated telephone self-management support program (ATSM) improved patient-centered dimensions of diabetes care in safety net clinics, the authors collaborated with a nonprofit Medicaid managed care plan to translate research into practice, offering ATSM as a covered benefit and augmenting ATSM to promote medication activation. This controlled quasi-experimental trial used a wait-list variant of a stepped wedge design to enroll 362 adult health plan members with diabetes who speak English, Cantonese, or Spanish and receive care at 4 publicly-funded clinics in SF Bay CRN. This trial design offers a useful illustration of the advantages and challenges of a wait-list variant of a stepped wedge design. The results of the recruitment process

suggest that ATSM with health coach counseling may be a viable strategy for low-income managed care plans caring for linguistically and culturally diverse vulnerable persons with diabetes using population-based recruitment. This design enabled all eligible SFHP members to receive ATSM as a benefit and increased the

A General Statistical Model for A Stepped Wedge Design

- Most commonly expressed using the notation of Hussey and Hughes (2007):

$$y_{ijk} = \mu + \alpha_i + \beta_j + X_{ij}\theta + \epsilon_{ijk}$$

- Design consists of:
 - I clusters (i=1...I)
 - T time points (j=1...T)
 - N individuals (k=1...N): n_i,b_i sampled per cluster per time point (i.e. cross-section adaptation)
- Model parameterized in terms of:
 - Grand mean (μ)
 - Random cluster effect (α_i)
 - (Vector of) Fixed time effect (β_j)
 - A treatment indicator (X_{ij}) which equals 1 if intervention present at cluster i at time j, else it is 0.
 - A fixed treatment effect (θ)
 - Residual noise (ϵ_{ijk})

In February 2015, the PBRN Resource Center hosted a Webinar on the stepped wedge design: [Advanced Methods for Primary Care](#)

[Research: The Stepped Wedge Design](#)

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feasibility of scaling up the intervention through recruitment waves, while retaining elements of randomization that help minimize bias.

Colorado Research Network ([CaReNet](#))

[Patient-centered diabetes self-management – Using boot camp translation to create diabetes informational materials](#): Patients with newly diagnosed type II diabetes are confronted with a large amount of information related to their new condition; however, rarely, if ever, are patient perspectives used to inform the design and content of informational materials. This study uses Boot Camp Translation (BCT) methods with the CaReNet Patient Advisory Council (PAC) to develop messages and materials to help type II diabetes patients better understand and manage their condition. Participants designed a 70-page booklet covering self-management, nutrition, medications, and diabetes physiology. It was designed for use at diagnosis to support the patient-clinical relationship in effectively managing diabetes. Through this study, BTC was found to be an effective process for developing patient-centered materials to assist type II diabetes patients in understanding and managing their illness.

Using Rapid-Cycle Research to Reach Goals

“Using Rapid-Cycle Research to Reach Goals: Awareness, Assessment, Adaptation, Acceleration” is a guide that provides resources and advice for conducting rapid-cycle research. Drawing on the experience of PBRNs, this resource describes methods for identifying problems that need to be solved, solutions that work in real world settings and study methods that can accelerate the research cycle. Changes in the delivery of primary care make it necessary to consider changes in the way research is conducted. Using rapid-cycle research helps research teams plan rapid-cycle studies that are practical and actionable.”

[Access the guide today!](#)



PBRNs: INNOVATIVE RESEARCH METHODS

Where to Learn More

Featured PBRNs	
<p>AAFP National Research Network (AAFP NRN) www.aafp.org/nrn Location: Kansas (With 800 Practices Across 50 States)</p>	<p>Primary (Care) Practices Research Network (PPRNet) www.musc.edu/pprnet Location: South Carolina (With 159 Practices Across 50 States, the territories of Guam, Puerto Rico or Virgin Islands, and Canada)</p>
<p>Duke Primary Care Research Consortium (PCRC) https://www.dcri.org/our-research/primary-care Location: North Carolina (With 32 Practices in 1 State)</p>	<p>San Francisco Bay Area Collaborative Research Network (SF Bay CRN) www.sfbaycrn.org Location: California (With 200 Practices in 1 State)</p>
<p>Kentucky Ambulatory Network (KAN) http://www.ccts.uky.edu/ccts/KAN Location: Kentucky (With 50 Practices in 1 State)</p>	<p>Upstate New York Practice Based Research Network (UNYNET) http://fammed.buffalo.edu/unynet/ Location: New York (With 49 Practices in 1 State)</p>
<p>New York City Research and Improvement Networking Group (NYC RING) http://www.einstein.yu.edu/departments/family-social-medicine/nycring/ Location: New York (With 38 Practices in 1 State)</p>	<p>Virginia Ambulatory Care Outcomes Research Network (ACORN) http://ctr.vcu.edu/community/acorn.html Location: Virginia (With 101 Practices in 1 State)</p>
<p>OCHIN Practice-Based Research Network (formerly SafetyNet West) (OCHIN PBRN) https://ochin.org/services/research/ Location: Oregon (With 729 Practices Across 13 States)</p>	<p>WWAMI region Practice and Research Network (WPRN) http://depts.washington.edu/fammed/research/centers/wprn Location: Washington (With 38 Practices Across 5 States)</p>

For more information on these and other AHRQ-registered PBRNs, visit the [PBRN Registry](#). Use the PBRN Registry [advanced search feature](#) to search for networks by location, type of network, health conditions of interest, and geographic coverage.



Citations

Baldwin LM, Keppel GA, Davis A, et al. Developing a practice-based research network by integrating quality improvement: challenges and ingredients for success. *Clin Transl Sci* 2012 Aug;5(4):351-5. PMID: 22883614.

Funding: This publication was made possible by Grant Number UL1 RR025014 from the National Center for Research Resources (NCR), a component of the National Institutes of Health (NIH), and NIH Roadmap for Medical Research.

Bertram S, Graham D, Kurland M, et al. Communication is the key to success in pragmatic clinical trials in Practice-based Research Networks (PBRNs). *J Am Board Fam Med* 2013 Sep-Oct;26(5):571-8. PMID: 24004709.

Funding: none.

Dolor RJ, Schmit KM, Graham DG, et al. Guidance for researchers developing and conducting clinical trials in practice-based research networks (PBRNs). *J Am Board Fam Med* 2014 Nov-Dec;27(6):750-8. PMID: 25381071.

Funding: This work was supported in part by the National Center For Advancing Translational Sciences of the National Institutes of Health under Award Numbers UL1TR000423 and UL1TR001117.

Douglas PS, Hoffmann U, Lee KL, et al. PROspective Multicenter Imaging Study for Evaluation of chest pain: rationale and design of the PROMISE trial. *Am Heart J* 2014 Jun;167(6):796-803 e1. PMID: 24890527.

Funding: This project was supported by R01HL098237, R01HL098236, R01HL98305, and R01HL098235 from the National Heart, Lung, and Blood Institute (NHLBI). The authors are solely responsible for the design and conduct of this study, all study analyses, the drafting and editing of the manuscript, and its final contents. This manuscript does not necessarily represent the official views of NHLBI.

Douglas PS, Hoffmann U, Patel MR, et al. Outcomes of anatomical versus functional testing for coronary artery disease. *N Engl J Med* 2015 Apr 2;372(14):1291-300. PMID: 25773919.

Funding: Funded by the National Heart, Lung, and Blood Institute; PROMISE ClinicalTrials.gov number, NCT01174550.

Ider WG, Munk N. Using the Pragmatic-Explanatory Continuum Indicator Summary (PRECIS) model in clinical research: Application to refine a practice-based research network (PBRN) study. *J Am Board Fam Med* 2014 Nov-Dec;27(6):846-54. PMID: 25381083.

Funding: Support for this study was provided by the National Center for Complementary and Alternative Medicine (grant no. R21AT004544), the National Center for Advancing Translational Sciences, and the National Institutes of Health (grant no. UL1 TR000117).

PBRNs: INNOVATIVE RESEARCH METHODS

Krist AH, Glenn BA, Glasgow RE, et al. Designing a valid randomized pragmatic primary care implementation trial: the my own health report (MOHR) project. *Implement Sci* 2013;8:73. PMID: 23799943.

Funding: Funding for the MOHR project was provided by the National Cancer Institute, Agency for Healthcare Research and Quality, Office of Behavioral and Social Sciences Research, and National Center for Advancing Translational Sciences (CTSA Grant Number ULTR00058). Dr. Stange's time is supported in part by a Clinical Research Professorship from the American Cancer Society and by the National Cancer Society through the Intergovernmental Personnel Act.

McKee MD, Deen D, Maher S, et al. Implementation of a pilot primary care lifestyle change intervention for families of pre-school children: lessons learned. *Patient Educ Couns* 2010 Jun;79(3):299-305. PMID: 20435428.

Funding: This work was supported by the Prescription for Health Program of the Robert Wood Johnson Foundation.

Ornstein SM, Miller PM, Wessell AM, et al. Integration and sustainability of alcohol screening, brief intervention, and pharmacotherapy in primary care settings. *J Stud Alcohol Drugs* 2013 Jul;74(4):598-604. PMID: 23739024.

Funding: This study was funded by National Institute on Alcohol Abuse and Alcoholism Grant R01AA016768.

Ratanawongsa N, Handley MA, Quan J, et al. Quasi-experimental trial of diabetes Self-Management Automated and Real-Time Telephonic Support (SMARTSteps) in a Medicaid managed care plan: study protocol. *BMC Health Serv Res* 2012;12:22. PMID: 22280514.

Funding: The study is funded by the Agency for Healthcare Research and Quality grants R18HS017261 and 1R03HS020684-01; Centers for Disease Control and Prevention grant #5U58DP002007-03; National Institute of Diabetes and Digestive and Kidney Diseases 1P30DK092924-01 for The HMO Research Network-University of California, San Francisco Center for Diabetes Translational Research (CDTR); and the McKesson Foundation.



For more information about the AHRQ PBRN Resource Center, please visit pbrn.ahrq.gov or e-mail PBRN@ahrq.hhs.gov.

