

UNIVERSITY of MARYLAND

Advancing Patient Centered Outcomes Research (PCOR): Implications for Research Methods and Standard Terminology

Second International Conference on Research Methods for Standardized Technologies

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Disclosures

Dr. Robin Newhouse has disclosed a relevant financial interest with Patient Centered Outcomes Research Institute (PCORI) and Getwell Network to the learners of this activity.

There are no conflicts of interest or relevant financial interests that have been disclosed by the remaining presenters or planners of this activity that apply to this learning session.

Objective

Discuss patient-centered outcomes research (PCOR) and implications for standardized terminologies

Outline

PCORI Standards PCORnet

PROEM PATIENTS Patients

Infrastructure and Training

Emerging Trends
Engagement
Data Harmonization
PROs

Key Points

- Standard terminology is essential to for learning health care systems
- Patient and stakeholder engagement are central to developing standard terminology for patient-centered outcomes research
- Patient reported outcomes should be incorporated into Electronic Health Records
- Standard terminology should be disseminated and used in health systems

pcori
PCORI Methodology Standards

Robin Newhouse is Chair of the Methodology Committee of the Patient Centered Outcomes Research Institute (PCORI). The views expressed in this presentation are those of the authors and not necessarily those of PCORI.

Patient-Centered Outcomes Research Institute

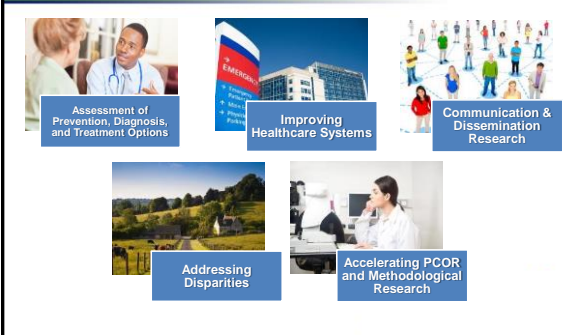
We Fund Research That...

- Studies the benefits and harms of interventions and strategies delivered in real-world settings
- Compares at least two alternative approaches
- Adheres to PCORI's Methodology Standards
- Is based on health outcomes that are meaningful to the patient population
- Engages patients and other stakeholders at every stage
- Is likely to improve current clinical practices

We Focus Attention On...

- Conditions**
 - Conditions that affect large numbers of people across a range of populations
 - Conditions that place a heavy burden on individuals, families, specific populations, and society
 - Rare diseases, which are difficult to study
- Populations**
 - Racial and ethnic minorities
 - Older adults
 - Low-income and rural populations
 - Children

The Research We Fund is Guided by Our National Priorities for Research



Assessment of Prevention, Diagnosis, and Treatment Options

Improving Healthcare Systems

Communication & Dissemination Research

Addressing Disparities

Accelerating PCOR and Methodological Research

We Target Specific, High-Priority Topics

- Assessment of Prevention, Diagnosis and Treatment Options**
 - PCOR Treatment Options in Uterine Fibroids*
- Improving Healthcare Systems**
 - Clinical Trial of a Multifactorial Fall Injury Prevention Strategy in Older Persons**
 - Effectiveness of Transitional Care
- Addressing Disparities**
 - Treatment Options for African Americans and Hispanics/Latinos with Uncontrolled Asthma
 - Obesity Treatment Options Set in Primary Care for Underserved Populations
 - Clinical Interventions to Address Hypertension Disparities

* Administered by AHRQ
 ** Administered by the National Institute on Aging

We Follow a Unique Proposal Review Process

Applications are reviewed against five criteria:

- Impact of the condition on the health of individuals/populations
 - Potential for the study to improve healthcare and outcomes
 - Technical merit
 - Patient-centeredness
 - Patient and stakeholder engagement
- Applications are reviewed by a panel of two scientists, one patient, and one other stakeholder.
 - PCORI's Board of Governors makes funding decisions based on merit review and staff recommendations.

We Work to Improve Research Methodology

In any study, methods matter. That's why we've developed methodology standards that all research should follow, at a minimum.

Methodology Standards: 11 Broad Categories

- Formulating Research Questions
- Patient-Centeredness
- Data Integrity and Rigorous Analyses
- Preventing/Handling Missing Data
- Heterogeneity of Treatment Effects
- Data Networks
- Data Registries
- Adaptive and Bayesian Trial Designs
- Causal Inference
- Studies of Diagnostic Tests
- Systematic Reviews

Role of the Standards in PCORI Applications

- 1 The Methodology Standards and report are tools for applicants in preparing their applications.
- 2 Applications must demonstrate adherence to PCORI's Methodology Standards.
- 3 Not all standards apply to all studies.
- 4 The standards do NOT dictate specific study designs.
- 5 The Methodology Standards map to PCORI's merit review criteria.
- 6 PCORI technical reviewers assess the methodological rigor of each study's methods.

Methodology Standards and Proposals

"In the Research Strategy section of the Research Plan Template, you should describe in detail your research strategy and plan, and you should demonstrate how your proposed study is responsive to the PFA. Include the relevant PCORI Methodology Standard citations (e.g., "PC-3") as identified in the [Methodology Report](#); you should refer to this report for an explanation on each standard. You do not need to list every standard, only standards that are relevant to your proposal."

See <http://www.pcori.org/content/faqs-applicants#WHAT%20TO%20INCLUDE>

The Standards Help to Craft a Research Question

RQ-1 Identify gaps in evidence

Gap analysis and systematic reviews should be used to support the need for a proposed study. If a systematic review is not available, a systematic review should be performed using accepted standards in the field (see standard SR-1), or a strong rationale should be presented for proceeding without a systematic review. In the case where a systematic review is not possible, the methods used to review the literature should be explained and justified.

RQ-6 Measure outcomes that people representing the population of interest notice and care about

Identify and include outcomes the population of interest notices and cares about (e.g., survival, function, symptoms, health-related quality of life) and that inform an identified health decision. Define outcomes clearly, especially for complex conditions or outcomes that may not have established clinical criteria. Provide information that supports the selection of outcomes as meeting the criteria of "patient-centered," and "relevant to decision makers" such as patient and decision maker input from meetings, surveys, or published studies. Select outcomes based on input directly elicited from patient informants, people representative of the population of interest, either in previous studies or in the proposed research.

The Standards Guide Development of Patient-Centered Projects

PC-2 Identify, select, recruit, and retain study participants representative of the spectrum of the population of interest and ensure that data are collected thoroughly and systematically from all study participants

PC-3 Use patient-reported outcomes when patients or people at risk of a condition are the best source of information

The Standards Address Missing Data

MD-1 Describe methods to prevent and monitor missing data

MD-3 Use validated methods to deal with missing data that properly account for statistical uncertainty due to missingness

Stories Highlight Important Methods Issues



RESEARCH IN PRACTICE: Missing Data

Courtney Schreiber, MD, MPH, is a gastroenterologist and clinical researcher at the University of Pennsylvania School of Medicine. Here she discusses how she uses patient narratives to learn more about how to make her studies in the world of patients. She also uses her patient stories to help recruit and retain patients in clinical trials.

How do you talk about missing data with patients?

Schreiber: I often tell a story about a participant named Sally. She enrolled in one of our comparative clinical trials. She was absolutely committed to helping women like herself figure out which type of contraceptive is best. But, after a while, she stopped coming to her study appointments for a significant event. When we called her up, she had no idea that dropping out of the study would make it harder for us to learn which medicine would be best. She knew that other women were waiting to enroll in the study, so she thought that someone could get into her spot.

Did Sally leave the study?

Schreiber: No. We were able to figure out how to get her to her appointment by bringing the research office representative on Thursday. One of the last forms in bringing Sally was being able to share her story much earlier in the form for us to figure out which medication would be best if we didn't have her the day at the end of the study. The trial was doing pretty good and though we could just use the data we had, Sally was able to understand how helpful it was for her to tell us in part of the basis, she finished the whole study.

How is Sally's story useful in retaining participants on other studies?

Schreiber: We always possess our study participants that we will work with them to find the most convenient ways to participate, but that message doesn't always work. But as soon as I share Sally's story, so it helps to explain why staying in the study is so helpful. And it really seems to work.

The stories are not intended to endorse specific research approaches; they demonstrate that good methods make a difference.

Patient Engagement vs. Patient-Centeredness

- **Patient engagement** is about having patients as partners in research as opposed to merely subjects
- Active engagement between scientists, patients, and stakeholders
- Community, patient, and caregiver involvement already in existence or a well-thought out plan

- **Patient-Centeredness** is a component of what PCOR is looking for in research applications
- Does the project aim to answer questions or examine outcomes that matter to patients within the context of patient preferences?
- Research questions and outcomes should reflect what is important to patients and caregivers



PCORnet

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*slides used with permission
*CDM slide by Rich Platt



pcornet

The National Patient-Centered Clinical Research Network

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Pivotal \$100M Infrastructure Investment



11 Clinical Data Research Networks (CDRNs)

System-based networks, such as integrated delivery systems, academic medical centers, federally qualified health centers,



18 Patient-Powered Research Networks (PPRNs)

Participants/patients working together to discover, propose, and answer relevant research questions. Building the tools to engage people more broadly in research from end to end.



Coordinating Center

Provides technical and logistical assistance under the direction of a steering committee and PCORI program staff

Spring 2015: Coming Into View



PCORnet's infrastructure built to:

- To leverage rich clinical **electronic health data** linking EHR data with private and public claims data (incl. CMS)
- Support both large **observational studies** and embedded **randomized clinical trials**
- Support novel models of **participant-led research**, integrate patient-preference science, and build robust patient-participation
- Involve **patients, clinicians, and health systems** leaders in governance and use of the network

DataMarts leveraging the CDRNs Electronic Health Data

- Each CDRN Network will have 1-10 DataMarts
- Total anticipated DataMarts: 75
- Annotated Data Dictionaries received: 62
- Software installation completed: 30
- Nine of 11 CDRNs have transformed data for at least one million individuals



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CDRNs Disease Cohorts

Organization	Common Cohort	Rare Cohort
ADVANCE	Diabetes	Co-infection with HIV and hepatitis C virus
CAP/ICORN	Anemia; Asthma	Sickle cell disease; Recurrent C. Difficile colitis
Great Plains Collaborative	Breast Cancer	Amiotrophic Lateral Sclerosis (ALS)
Louisiana Clinical Data Research Network	Diabetes	Sickle Cell Disease, Rare Cancers
NYC-CDRN	Diabetes	Cystic fibrosis
Mid-South CDRN	Coronary Heart Disease (CHD)	Sickle Cell Disease (SCD)
PEDSNet	Inflammatory bowel disease	Hypoplastic left heart syndrome
PORTAL	Colorectal Cancer	Severe Congenital Heart Disease
pSCANNER	Congestive Heart Failure	Kawasaki Disease
P2ATH	Atrial Fibrillation	Idiopathic Pulmonary Fibrosis
SCIHLS	Osteoarthritis	Pulmonary arterial hypertension

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PCORnet Common Data Model v2.1

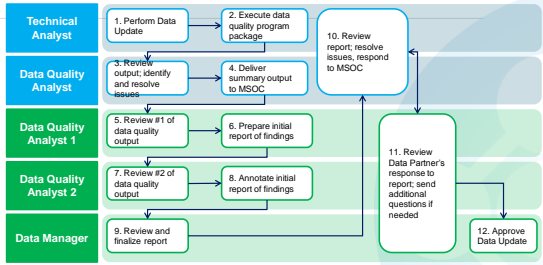
DEMOGRAPHIC	VITAL	ENCOUNTER	LAB_RESULT
PATID BIRTH_DATE BIRTH_TIME SEX HISPANIC RACE BROKERS_FLAG	PATID ENCOUNTERED (optional) MEASURE_DATE MEASURE_TIME VITAL_SOURCE HT WT DIASTOLIC SYSTOLIC ORIGINAL_BMI BP_POSITION	PATID ENCOUNTERED SITEID ENCOUNTERED_DATE ADMIT_TIME DISCHARGE_DATE DISCHARGE_TIME PROVIDERID FACILITY_LOCATION ENC_TYPE FACILITYID DISCHARGE_DISPOSITION DISCHARGE_STATUS DRG DRG_TYPE ADMITTING_SOURCE	PATID ENCOUNTERED (optional) LAB_NAME SPECIMEN_SOURCE LAB_LOINC STAT RESULT_LOC LAB_PX LAB_PX_TYPE LAB_ORDER_DATE SPECIMEN_DATE RESULT_TIME RESULT_SCALE RESULT_UNITS RESULT_MODIFIER NORM_RANGE_LOW NORM_RANGE_HIGH MODIFIER_HIGH ABN_IND
ENROLLMENT	CONDITION	DIAGNOSIS	PROCEDURE
PATID ENR_START_DATE ENR_END_DATE CHART ENR_BASIS	PATID ENCOUNTERED (optional) REPORT_DATE RESOLVE_DATE CONDITION_STATUS CONDITION_TYPE CONDITION_SOURCE	PATID ENCOUNTERED ENC_TYPE (optional) ADMIT_DATE (optional) PROVIDERID (optional)	PATID ENCOUNTERED ENC_TYPE (optional) ADMIT_DATE (optional) PROVIDERID (optional) PS_DATE PS_TYPE
PRESCRIBING	PRO_CM		
PATID RX_DATE RX_NX RX_SUP RX_AMT	PATID ENCOUNTERED (optional) CM_ITEM CM_LOINC CM_DATE CM_TIME CM_RESPONSE CM_METHOD CM_MODALITY CM_CAT		

Data captured from healthcare delivery_direct encounter

<http://www.pcornet.org/resource-center/pcor-net-common-data-model/>

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Data Quality Assurance review process



Coming Into View – Funded PCORnet Demonstration Projects

- 🔗 RCT: A Patient-centric Trial Assessing Benefits and Long-term Effectiveness (ADAPTABLE) Trial
 - Comparative effectiveness of 81 vs 325 mg of aspirin for secondary prevention of cardiac events and serious bleeding
- 🔗 Observational CER in the Weight Cohort – one or two large observational studies
 - Compare **bariatric surgery procedures** on weight loss, regain, and other outcomes
 - Comparative **effect of different antibiotics in children** under 2 years on BMI, patterns of growth, and rates of obesity by ages 3-5 years
- 🔗 PPRN Demonstration Projects
 - PCORI will fund CER projects generated by patient communities of the PPRNs

Guiding principle: Make research easier

- 🔗 Analysis ready data
 - Standard format
 - Harmonized definitions
 - Quality checked in advance
- 🔗 Reusable analysis tools
- 🔗 Efficient clinical trial enrollment and follow up mechanisms
- 🔗 Simple, pragmatic studies integrated into routine care
- 🔗 Administrative simplicity

Goal of demonstration observational and interventional studies

- 🔗 Address questions important to patients and clinicians that require multi-site evaluation
- 🔗 Facilitate collaboration between PCORnet's networks
- 🔗 Guide further development of PCORnet policies, procedures, infrastructure
- 🔗 Evaluate the readiness of PCORnet's data and networking capabilities
- 🔗 Assess PCORnet's privacy protecting data infrastructure and analysis capabilities
- 🔗 Develop efficient methods for identifying potential clinical trial participants, reaching out to them, enrolling, and obtaining follow up
- 🔗 Assess end-to-end functionality, from protocol development through implementation, analysis, and reporting

Requirements for Network Participation in Observational Studies

- 🔗 Work with a single IRB of record (1 per project)
- 🔗 Complete contracting and data use agreements quickly
- 🔗 Have analysis ready data (Common Data Model v2.1)*
- 🔗 Use PCORnet's networking querying capabilities*
- 🔗 Execute supplied QC and analytical programs (SAS) without modification*
- 🔗 Share relevant data and documentation

* Clinical data research networks

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Find Us Online



www.pcori.org

PCOR Infrastructure and Training

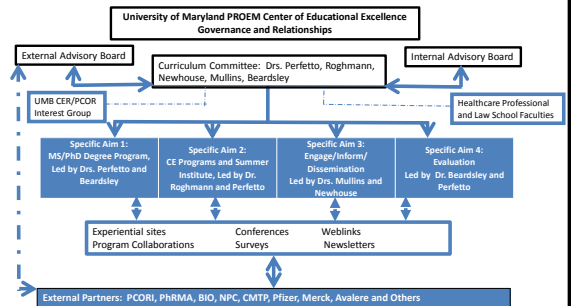
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Patient-Centered Research for Outcomes, Effectiveness and Measurement (PROEM) A Center of Excellence in Comparative Effectiveness and Patient-Centered Outcomes Research (CER-PCOR) Training

Eleanor M. Peretto, PhD, MS, Professor
Department of Pharmaceutical Health Services Research
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Course Content

	Clinical Outcomes Assessment	Introduction to CER/PCOR	Quality and Performance
Standardized Terminology	X	X	X
Data Harmonization	X	X	X

Patient Engagement is a Means for:

- Empowering and Inspiring the Community
- Building Trust for Authentic Partnerships
- Improving Health and Healthcare Decisions
- Advancing Patient-Driven Scientific Discovery

10-STEP FRAMEWORK FOR CONTINUOUS PATIENT ENGAGEMENT IN RESEARCH*

A. PLANNING RESEARCH

1. Topic Solicitation
2. Prioritization
3. Framing the Question

B. DOING IT

4. Selection of Comparators and Outcomes
5. Creation of Conceptual Framework
6. Analysis Plan
7. Data Collection

C. DELIVERING SOLUTIONS

8. Reviewing & Interpreting Results
9. Translation
10. Dissemination

*Based on: Mullins CD, Abdulhalim AM, Lavallee DC. Continuous Patient Engagement in Comparative Effectiveness Research. JAMA 2012; 307(15): 1587-8.

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Data Harmonization for Patient-Centered Clinical Research

- Meet networks where they are
- Capitalize on diversity of networks
- Specify the “must have narrow neck”; make everything else modular
- Pay special attention to patient-generated data
- Maximize transparency
- Leverage existing standards and support institutional priorities
- Ground the approach in iteration and validation

IOM. (2014). Data Harmonization for Patient-Centered Clinical Research. Available at: <http://www.iom.edu/-/media/Files/Activity%20Files/Quality/VSRT/Data-Harmonization/VSRT-WIB-DataHarmonization.pdf>

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Committee on Core Metrics for Better Health at Lower Cost

“The Committee on Core Metrics for Better Health at Lower Cost will conduct a study and prepare a report directed at exploring measurement of individual and population health outcomes and costs, identifying fragilities and gaps in available systems, and considering approaches and priorities for developing the measures necessary for a continuously learning and improving health system.”

IOM. (2015). The Committee on Core Metrics for Better Health at Lower Cost. Available at <http://iom.edu/Activities/Quality/CoreMetricsForBetterHealth.aspx>

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PCORI Patient-Reported Outcomes (PRO) Infrastructure Workshop “Integrating PROs into EHRs”

- A.5. Develop interoperable open data platforms and web tools that can interface with EHRs, to encourage standardized large-scale PRO assessment and evaluation across many health care systems (including non-integrated health care delivery systems).
- A.6. Establish minimum standards for PRO measure development, use and interpretation.
- A.7. Develop PRO measurement sets that serve multiple needs in multiple settings.

Available at: <http://www.pcori.org/sites/default/files/PCORI-PRO-Infrastructure-Workshop%20Report-111913.pdf>

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PCOR and Nursing Science

TABLE 1. Comparison of Nursing Research Goals and Patient-Centered Outcomes Research Institute Activities

Nursing research ^a	Patient-Centered Outcomes Research Institute
Build the scientific foundation for clinical practice	Produces dependable information that can inform health decisions
Prevent disease and disability	Provides evidence that guides decisions about prevention of disease
Manage and eliminate symptoms caused by illness	Provides evidence to improve outcomes that patients care about, such as function, symptoms, health-related quality of life, and survival

^aSource: National Institute of Nursing Research (n.d.).

Newhouse, R.P., Barksdale, D., Miller, J. Research Done Differently: The Patient-Centered Outcomes Research Institute (PCORI). (2015). *Nursing Research*, 64(1), 72-77.

Key Points

- Standard terminology is essential to for learning health care systems
- Patient and stakeholder engagement are central to developing standard terminology for patient-centered outcomes research
- Patient reported outcomes should be incorporated into Electronic Health Records
- Standard terminology should be disseminated and used in health systems

References

Fleurence, R., Whicher, D., Dunham, K., Gerson, J., Newhouse, R., Luce, B. (2015). The Patient-Centered Outcomes Research Institute's Role in Advancing Methods for Patient-Centered Outcomes Research. *Medical Care*, 53(1), 2-8. Doi: 10.1097/MLR.0000000000000244.

Methodology Committee of the Patient-centered Outcomes Research Institute. Aronson, N., Basch, E., Berg, A., Flum, D., Goodman, S.N., Helfand, M., Ioannidis, J.P., Lauer, M., Meltzer, D., Mittman, B., Newhouse, R., Schneeweiss, S., Slutsky, J., Tinetti, M., Yancy, C. (2013). Hickam, D., Totten, A., Berg, A., Rader, K., Goodman, S., Newhouse, R. (eds.). PCORI Methodology Report. Available at: <http://www.pcori.org/assets/2013/11/PCORI-Methodology-Report.pdf>

See summary of PCORI study results and related papers at:
<http://www.pcori.org/content/pcori-literature>

Using the PCORI Methodology Standards available at:
<http://www.pcori.org/events/2013/using-pcori-methodology-standards>

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