

## Title Slide:

National Cancer Institute  
U.S. Department of Health and Human Services  
National Institute of Health

Comparative Effectiveness Research (CER):  
An Implementation Science Perspective

[image]

Cartoon racetrack with a pill racing against a medical device toward the finish line which says  
“Effectiveness.”

[end image]

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## Slide 2: Presentation Outline

1. Overview of CER
2. CER from the Implementation Science (IS) Perspective
3. CER Activities and collaborations at the NCI/DCCPS, NIH, HHS Levels
4. CER Opportunities
5. Discussion- Q&A about how CER can be relevant to BRP- and why you should care

## Slide 3: Defining CER

Comparative effectiveness research is the conduct and synthesis of research comparing the benefits and harms of different interventions and strategies to prevent, diagnose, treat and monitor health conditions in “real world” settings<sup>1</sup>.

Types of CER<sup>2</sup>

- Clinical Trials including Pragmatic Trials
- Observational studies and modeling
- Secondary data analysis using registries and linked databases
- Research Synthesis

<sup>1</sup>Federal Coordinating Council for CER’s [Report to the President Congress](#) (2009).

<sup>2</sup>Institute of Medicine Comparative Effectiveness Research.

## Slide 4: Background on CER

- Health Technology Assessment (HTA)
  - HTA has a long tradition, eg U.S. Office of Technology Assessment (1975)
  - To varying degrees, used for financial coverage decisions and clinical guidelines development (USPSTF, private health insurance companies and (rarely) Medicare)
- Comparative Effectiveness Research (CER)
  - American Recovery and Reinvestment Act of 2009
  - Health Care Reform Act of 2010

## Slide 5: CER in the media

Scientific American (July 2011)

[image]

Journal Header - "The Best of Medicine. A quiet revolution in comparative effectiveness research just might save us from souring medical costs"

[end image]

[image]

San Francisco Business Times Journal Article Header – "Biotech. New comparative effectiveness tests are a challenge for drugmakers. Which drug is the best?"

[end image]

[image]

Washington Post Article header – "Comparative Effectiveness research tackles medicine's unanswered questions."

[end image]

## Slide 6: Audience(s) of CER: Diverse Stakeholders with Diverse Perspectives

[image]

Five circles are overlapping one another. Circles are titled:

- Researchers
- Policymakers and Legislators
- Providers and professional organizations
- Commercial Industry
- Patients, Public, and Advocacy Groups

[notes]

The diverse audiences represents a challenge to dissemination and implementation work. Messages must maintain fidelity to the evidence, but be expressed to very diverse audiences, who may have high health literacy but little knowledge of research methods, or, conversely, low health literacy but personal experience with the condition. CER methods can be quite technical, and describing, for example, a non-inferiority study design in lay terms can be a challenge.

[end notes]

## Slide 7: Study designs for CER

"Design should fit the question...not vice-versa"

- Randomized trial
- Non-randomized trial
- Prospective cohort study
- Retrospective cohort study
- Interrupted time series with comparison group
- Controlled before-after study
- Simulation modeling
- Non-concurrent cohort study
- Nested case-control study
- Case-control study
- Non-inferiority design

- Systematic review
- Realist reviews
- Natural Experiments
- Preference designs

List adapted from “Developing and testing a tool for the classification of study designs in systematic reviews of interventions and exposures,” Alberta EPC 01/11

[notes]

A standardized terminology is important in all areas of science. If different disciplines use different terminology for the same study design (or the same terminology for different study designs), confusion will of course occur. The Alberta EPC recommends these standard terms. Dissemination research can utilize several of these designs, modified with concepts such as cluster analyses.

[end notes]

### Slide 8: CER vs. Conventional NIH Trials

- CER is about “effectiveness,” whereas most NIH trials are about “efficacy”
- Comparison against a placebo control is not CER
  - But comparison against a well defined and measured “current standard of care” can be CER
- CER is about “real world” patient populations and treatments settings
  - This may mean a different balance between internal and external validity

### Slide 9: CER from an Implementation Science Perspective

- “...the bulk of CER research may focus on pharmacological therapies, medical devices, or clinical procedures, but all definitions emphasize that CER includes behavioral interventions, and evaluation of alternative systems of care.
- Though rarely stated, these definitions also imply that CER can expand to examine and compare the effectiveness of environmental and policy interventions.” \*
- IOM Priorities for CER include comparisons of strategies to improve the uptake of interventions and guidelines
- CER-T = CER that will TRANSLATE (into the real world)

\*From Glasgow, R & Steiner, J. Comparative effectiveness research to accelerate translation: Recommendations for “CER-T”. In R Brownson, G Colditz, E Proctor (Eds) Dissemination and Implementation Research in Health. New York: Oxford, in press

### Slide 10: CER-T Research

Pragmatic vs. Explanatory

- A pragmatic (or practical) trial seeks to answer the question, “Does an intervention work under usual conditions?”
- An explanatory (or efficacy) trial seeks to answer the question, “Can an intervention work under ideal conditions?”

Thorpe KE et al., Can Med Assoc J, 2009, 180: E47-57

Tunis SR et al. Practical clinical trials...*JAMA* 2003;290:1624-1632

Glasgow RE et al. Practical clinical trials...*Med Care* 2005;43(6):551-557

## Slide 11: Pragmatic CER Intervention Studies:

### Key Contextual Characteristics

- Questions from and important to stakeholders
- Multiple, heterogeneous settings
- Diverse populations
- \*\*Comparison conditions are real-world alternatives\*\*
- Multiple outcomes important to decision and policy makers

Thorpe KE et al., Can Med Assoc J, 2009, 180: E47-57

Tunis SR et al. Practical clinical trials...*JAMA* 2003;290:1624-1632

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[notes]

There are 5 key defining features to practical, or pragmatic trials. At the bottom are some of the key references on characteristics and examples of practical trials.

[end notes]

## Slide 12: Key CER-T and Pragmatic Trials Features: Implementation Science Perspective

- Reach- do those most in need participate?
- Generalizability- across settings, staff, and subgroups
- Context- description and analysis of setting
- 'Real-world' emphasis- including cost and feasibility
- Replication
- Sustainability (of behavior and systems change across life course)

[notes]

From a broader perspective, and connecting to other things we have talked about over the week, here are some of the key principles or issues that are emphasized in pragmatic trials. In particular you see our old friend context front and center.

[end notes]

## Slide 13: CER Controversies

- Inclusion of costs, cost-effectiveness, and use of economic data
- RCTs vs. alternatives designs
- Types of reviews- Cochrane vs. realist
- Issue of variation across settings
- Stay tuned- ☺ rapidly moving field

## Slide 14: American Recovery and Reinvestment Act Priority Setting

- Federal Coordinating Council for Comparative Effectiveness Research
  - Authorized by ARRA to help coordinate CER ARRA funding
  - Report to the President and Congress
- IOM CER Report
  - tasked by Congress through ARRA to recommend national priorities for research questions

### Slide 15: IOM CER Report:

#### Examples of Cancer Priorities

- Compare management strategies for localized prostate cancer on survival, recurrence, side effects, quality of life, and costs
- Compare imaging technologies in diagnosing, staging, and monitoring patients with cancer including PET, MRI, and CT
- Compare genetic and biomarker testing and usual care in preventing and treating breast, colorectal, prostate, lung, and ovarian cancer, and possibly other clinical conditions
- Institute of Medicine Comparative Effectiveness Research Report. (2009.)

### Slide 16: IOM Recommendations for long-term investment

- Ensuring meaningful consumer, patient, and caregiver participation
- Building robust information systems and research methods
- Development and support of a highly skilled CER workforce
- Support efforts to translate CER knowledge into everyday clinical practice.

### Slide 17: ARRA CER funding

\$400 M (NIH) + \$300 M (AHRQ) + \$400 M (HHS OS) = \$1.1 B

### Slide 18: NCI ARRA funding for CER \$121 million

[image]

Pie chart showing three sections

- DCCPS BRP - \$7,733,027 (6%)
- Rest of DCCPS - \$65,849,441 (55%)
- Rest of NCI - \$47,334,552 (39%)

[end image]

### Slide 19: Patient Centered Outcome Research Institute (PCORI)

#### Mandated by Patient Protection and Affordable Care Act (Health Care Reform)

- Defined CER as “*research evaluating and comparing health outcomes and the clinical effectiveness, risk and benefits of two or more medical treatments, services or items.*”
- PCORI will:
  - Set research priorities and research agenda
  - Conduct and support CER
  - Develop methodologies
  - Develop data resources
  - Obtain and use data from Federal government
  - Establish advisory panels
- HHS directed to build data capacity for CER, including the development and use of clinical registries and health outcomes research data networks.
- AHRQ directed to, with NIH, disseminate PCORI’s research findings and other government-funded research, and to establish a grant program that provides for the training of CER researchers.

<http://www.pcori.org/>

## Slide 20: NIH and AHRQ have Complementary Roles

[image]

Two overlapping circles with a bi-directional arrow between them. First circle contains the words, “NIH – Evidence Generation”. Second circle contains the words, “AHRQ – Research Analysis; Systematic Reviews; Evidence Synthesis”. An arrow with the word “inform” goes from the circles to the words “Payers and Providers.”

[end image]

[notes]

NIH and AHRQ Collaborate Closely on Some CER Initiatives

NIH CTSA are home to many AHRQ programs, including

- Evidence –Based Practice Centers
- CERTS
- DeCIDE

[end notes]

## Slide 21: HHS CER initiatives

- HHS CER Inventory
- Multi-Payer Claims Database (MPCD)
- Observational Medical Outcomes Partnership (OMOP)
- NIH/CMS collaborations

## Slide 22: HHS CER Inventory

- The CER Inventory will catalog CER activities, including ongoing and completed CER.
- The CER Inventory will be publicly available, and will be designed for a diverse community of stakeholders including researchers, policy makers, decision-makers, health care providers, patients, and consumers.
- The CER Inventory will include records (e.g., abstracts and other summary descriptive information) of CER and information related to CER, including research and resources on methods and training for CER, data infrastructure and databases to support CER, and methods and approaches for translation and dissemination of CER to help inform health care decisions and policies.

## Slide 23: Multi-Payer Claims Database(MPCD)

- Assistant Secretary for Planning & Evaluation (ASPE) and Centers for Medicare & Medicaid (CMS)
- To build and operate a HHS MPCD to support CER, building on a foundation of public and private payer claims data (Note: CER broadly defined to include clinical and non-clinical research)
- Incorporating public and private data into one source will increase value over existing disparate data sources
  - Greater geographic coverage
  - Increased demographic and clinical representativeness
  - Ability to study less common conditions
  - Enhance the value of effectiveness research (e.g. real life settings)

## Slide 24: Observational Medical Outcomes Partnership (OMOP)

- Public-Private Partnership with Foundation for the National Institutes of Health, Food & Drug Administration, and the Pharmaceutical Research & Manufacturers of America
- To inform the appropriate use of observational healthcare databases for studying the effects of medical products
  - **Conduct methodological research** to empirically evaluate the performance of alternative methods on their ability to identify true associations
  - **Develop tools and capabilities** for transforming, characterizing, and analyzing disparate data sources across the health care delivery spectrum
  - **Establish a shared resource** so that the broader research community can collaboratively advance the science

## Slide 25: NIH/CMS collaborations

Inter-agency leadership work areas include:

- Area 1: NIH serving as an early warning system for CMS of newly validated interventions coming down the pike.
- Area 2: CMS providing the sample and venue for testing incentives to shape physician and patient behavior in successful execution of clinical practice, practical clinical trials, and large scale experiments.
- Area 3: Enhancing research use of CMS data.

## Slide 26: NIH CER Coordinating Committee

- Created in 2009 to ensure the optimal use of the CER stimulus funds, developing funding recommendations for the NIH Director, and defining NIH's future role in CER.
- Subcommittees:
  - NIH-AHRQ CER Workgroup
  - NIH-VA CER Workgroup
  - NIH CER Fingerprint Workgroup
  - NIH CER "Speakers Bureau"
  - Trans-NIH CER Portfolio Workgroup

## Slide 27: CER-T Opportunities: The Trans-NIH D&I Funding Announcement

- R01 - PAR 10-038 (\$500k per annum up to five years)
- R03 - PAR 10-039 (\$50K per annum up to two years)
- R21 - PAR 10-040 (\$275K up to two years)
- Participating Institutes: NIMH, NCI, NIDA, NIAAA, NIAID\*, NHLBI, NINR, NIDDK\*, NINDS\*, NIDCD, NIDCR, NCCAM\* & Office of Behavioral & Social Sciences Research
- Starting October 2010, new standing review committee, Dissemination and Implementation Health Research
- Three submission dates per year: **February, June, October**

\* New Participating Institutes

## Slide 28: Potential Areas of CER-T Investigation

- Incremental contributions of EHR and PHR innovations to enhance health care quality
- Complex multi-level interventions for complex patients
- Rapid learning health care systems- e.g. VA QUERI approaches
- Crowdsourcing for health; social networking
- Policy-program interactions
- Variation and determinants of variation across settings in large scale-up projects
- Clinical and community integration and coordination

### Slide 29: Get Involved in Behavioral Science CER

- Track PCORI calls for information and related issues: <http://www.pcori.org/>
- Attend and submit to NIH Annual D & I Research Meeting- March 19-21, 2012  
<http://conferences.thehillgroup.com/obssr/di2012/index.html>
- Send trainees to the NIH D & I summer training institute  
<http://conferences.thehillgroup.com/OBSSRinstitutes/TIDIRH2011/index.html> (PPT talks with notes on CER, pragmatic studies, realist reviews, etc. available online)
- Attend CER Training Opportunities
- Encourage grantees to submit CER-T applications to the trans-NIH PAR 10-038 to 040

### Slide 30: CER: Take Home Points

- Real world focus- relevant to stakeholders
- Multi-level representativeness and diversity
- Context-sensitive Pragmatic studies endorsed by CONSORT (e.g., PRECIS criteria)
- Congruent with networks and systems, VA, HMO, PBRN, and CTSA research
- Bottom Line: TRANSPARENCY

### Slide 31: Questions? Comments?

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NCI Implementation Science Website: <http://cancercontrol.cancer.gov/IS/>