

Health Care Systems Research Collaboratory

Collaboratory Coordinating Center Update

Collaboratory Coordinating Center 3.0 – Moving towards a learning health system

August 19th, 2014 Collaboratory Steering Committee Meeting

Key Points

- We have an amazing opportunity to use a new information and clinical learning fabric to inform better decisions at the individual, health system and community level
- The Collaboratory effort provides a fascinating vantage point for the transformation
 - Tremendous progress and opportunity
 - Evidence of hurdles or speed bumps
- The key issues are well delineated by the cores/working groups
- All key issues are not equal!
- If we reach a common understanding of stakeholder/participant engagement, data quality standards, functional distributed research networks (DRNs) and ethics principles with regulatory implementation, the learning health system will take off at an accelerated pace

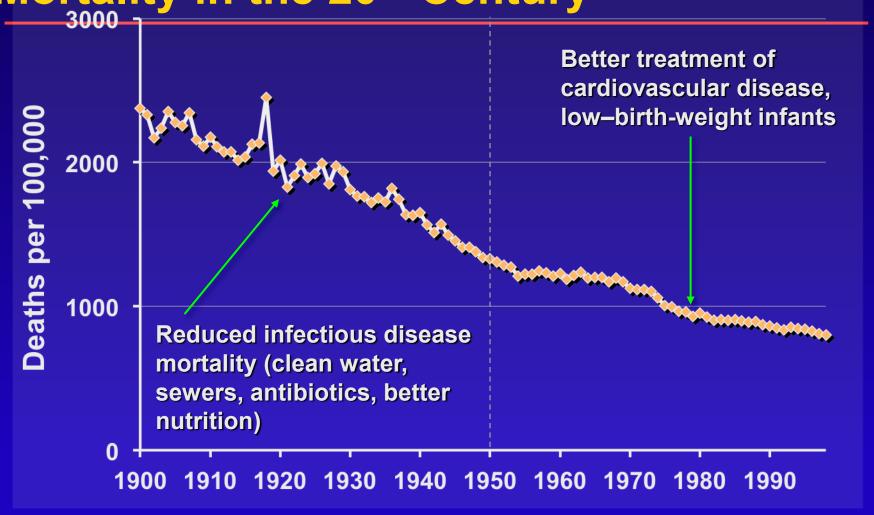


We Know what to Do

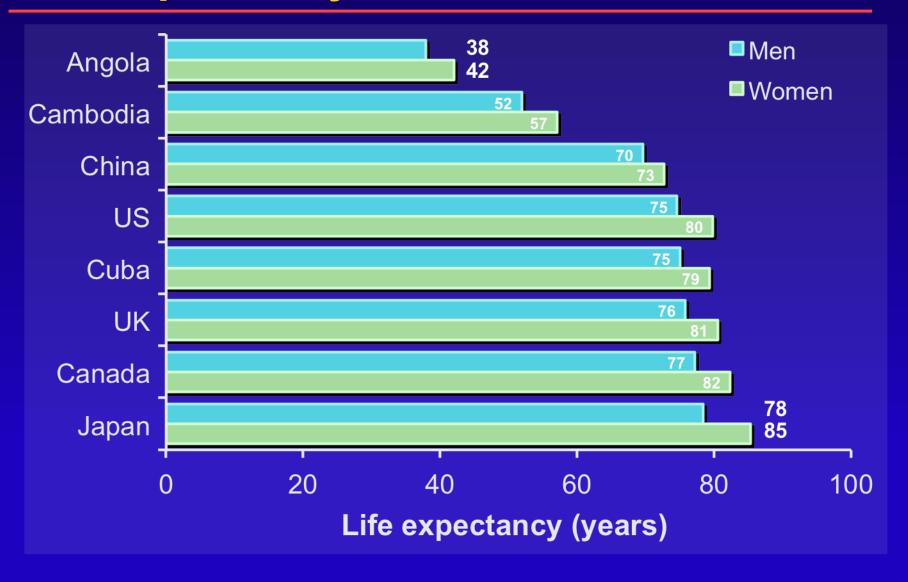
- Develop effective preventive approaches, diagnostic and disease management strategies and therapies
- Evaluate them with definitive trials with high quality data
- Implement using feedback loops with rapid and slow cycles



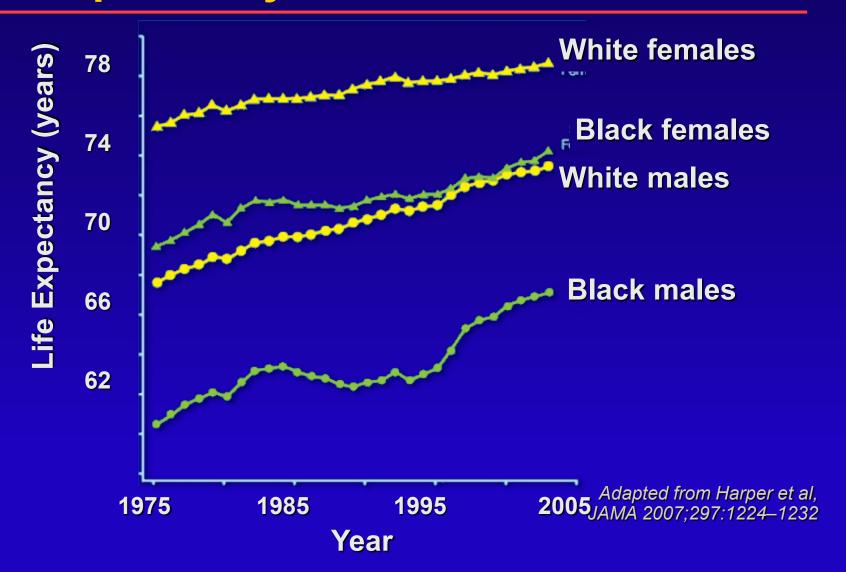
Mortality in the 20th Century



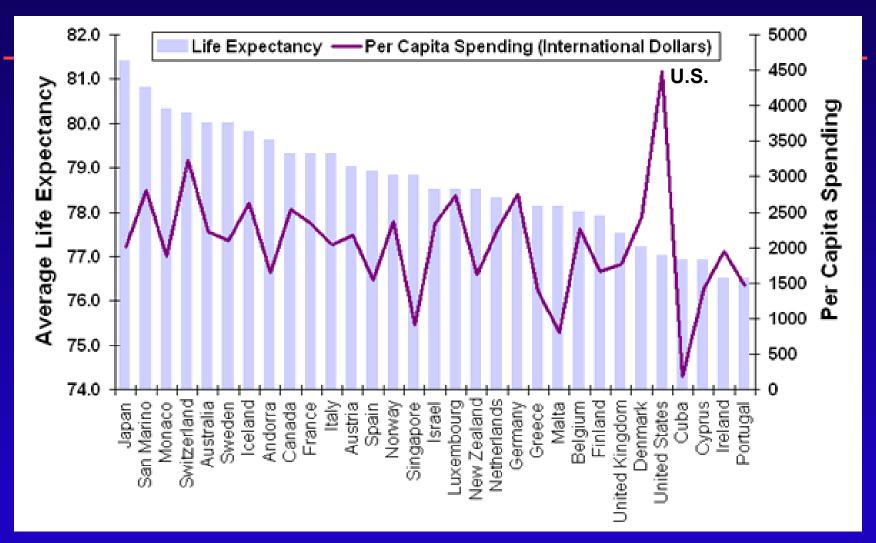
Life Expectancy Around the World



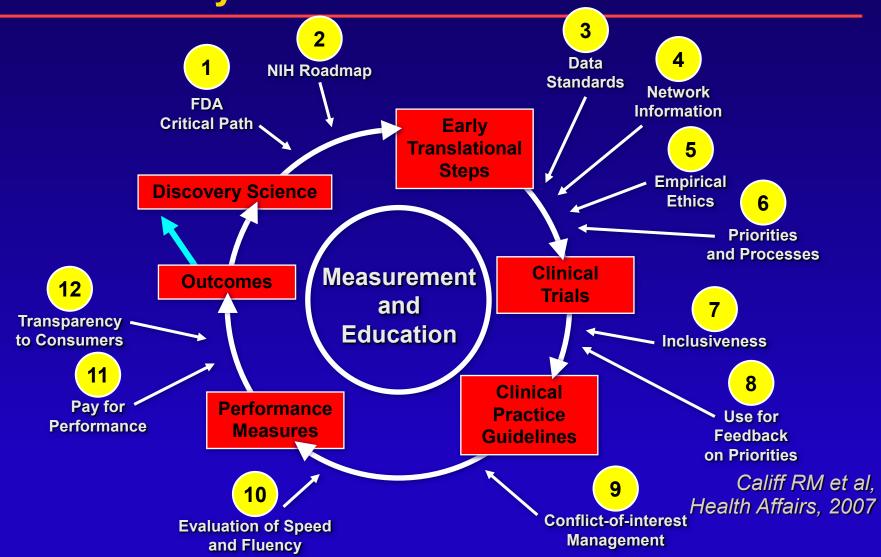
Life Expectancy at Birth



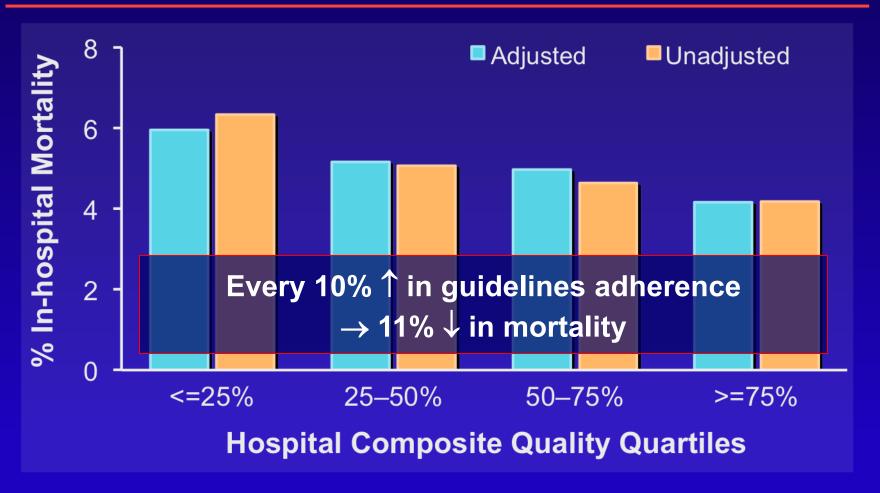
The Cost of a Long Life



The Cycle of Quality: Generating Evidence to Inform Policy



Link Between Overall ACC/AHA Guidelines Adherence and Mortality



Which Treatment is Best for Whom? High-Quality Evidence is Scarce



Scientific Evidence Underlying the ACC/AHA Clinical Practice Guidelines

Pierluigi Tricoci, MD, MHS, PhD

Joseph M. Allen, MA

Judith M. Kramer, MD, MS

Robert M. Califf, MD

Sidney C. Smith Jr, MD

lines are systematically developed statements to assist practitioners with decisions about appropriate health care for spe-

Context The joint cardiovascular practice guidelines of the American College of Cardiology (ACC) and the American Heart Association (AHA) have become important documents for guiding cardiology practice and establishing benchmarks for quality of care.

Objective To describe the evolution of recommendations in ACC/AHA cardiovascular guidelines and the distribution of recommendations across classes of recommendations and levels of evidence.

Data Sources and Study Selection Data from all ACC/AHA practice guidelines issued from 1984 to September 2008 were abstracted by personnel in the ACC Science and Quality Division. Fifty-three guidelines on 22 topics, including a total of 7196 recommendations, were abstracted.

Applying Classification of Recommendations and Level of Evidence

Class I

Benefit >>> Risk

Procedure/ Treatment
SHOULD be
performed/
administered

Class IIa

Benefit >> Risk
Additional studies with
focused objectives
needed

IT IS REASONABLE to perform procedure/administer treatment

Class IIb

Benefit ≥ Risk
Additional studies with
broad objectives needed;
Additional registry data
would be helpful

Procedure/Treatment

MAY BE CONSIDERED

Class III

Risk ≥ Benefit No additional studies needed

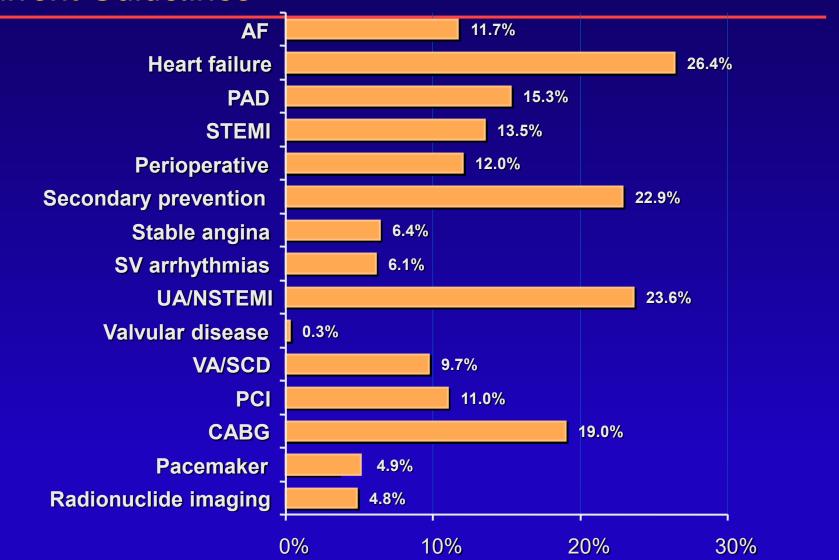
Procedure/Treatment should NOT be performed/administered SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL

| Level A: | Recommendation based on evidence from multiple randomized trials or meta-analyses Multiple (3-5) population risk strata evaluated; General consistency of direction and magnitude of effect |
|----------|---|
| Level B: | Recommendation based on evidence from a single randomized trial or non-randomized studies Limited (2-3) population risk strata evaluated |

| Level C: | Recommendation based on expert opinion, case studies, or standard-of-care |
|----------|---|
| | Very limited (1-2) population risk strata evaluated |

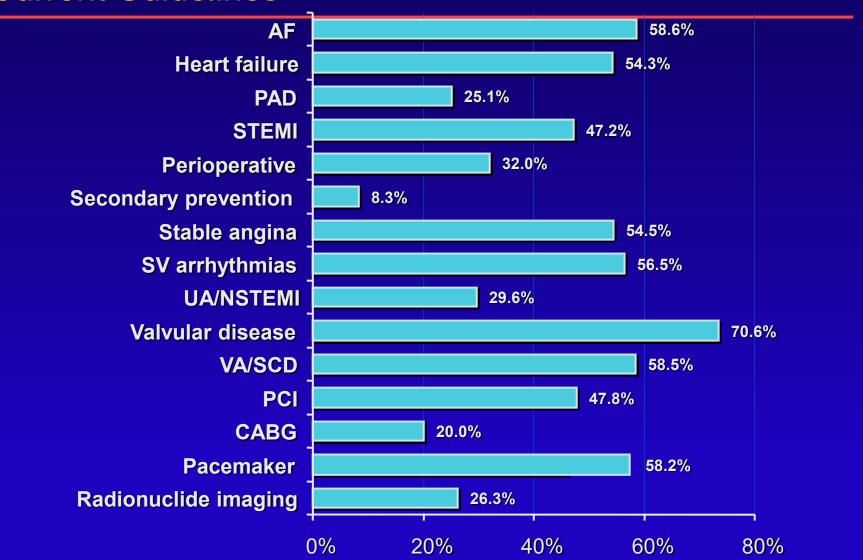
Level of Evidence A

Current Guidelines*



Level of Evidence C

Current Guidelines*



Why Don't we Just do It?

- Clinical research is the fuel for the knowledge about what to do in the delivery system
- Current clinical research methods are
 - Too expensive
 - Slow and burdened with bureaucracy
 - Impede efficient practice
 - Have limited generalizability because the studies are conducted in an artificial parallel universe
 - OTHER THAN THESE ISSUES, EVERYTHING IS JUST FINE WITH CLINICAL RESEARCH!



What is a Learning Health System?

- There is an intent to learn from experience in the application of healthcare delivery
- The key differences that make this possible now are two-fold
 - The ready applicability of data captured electronically so that it can be shared with others, analyzed and turned into information and knowledge
 - The cultural attitude is that it is GOOD to share information because it is through aggregate analysis that we can support good decisions for our own health, those we care about and everyone else
- A learning health system is the opposite of an IGNORANT health system in which the default is secrecy and hoarding of data



Learning Health System vs Ignorant Health System

- Ignorance is a state of being uninformed (lack of knowledge). The word ignorant is an adjective describing a person in the state of being unaware and is often used as an insult to describe individuals who deliberately ignore or disregard important information or facts. Ignoramus is commonly used in the US, the UK, and Ireland as a term for someone who is willfully ignorant.
- Ignorance is distinguished from stupidity, although both can lead to "unwise" acts.
 - Wikipedia





Re-engineering the Clinical Research Enterprise

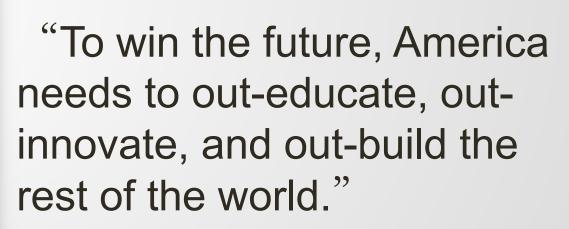


| Plan and start a few demonstration networks Simplify complex regulatory systems – demonstration projects Plan for networks in place for all institutes | Funding mechanism to sustain national system through consensus of all constituents ("1% solution") Simplified regulatory system in place for networks | National Clinical Research System creates effectiveness data that moves rapidly into the community AND data on outcomes and quality of care; sustained efficient infrastructure to rapidly initiate large clinical trials; scientific information for patients, families, advocacy groups |
|---|---|---|
| Establish repositories of biological specimens and standards for collection Standardize nomenclature, data standards, core data, forms for most major diseases Start a library of these elements shared between institutes and NLM Develop efficient network administration infrastructure at NIH Develop standards for capturing images for research | Data standards shared across NIH institutes Funding mechanisms evaluated to determine which are most efficient | ONE medical nomenclature with national data standards (agreed to by NIH, CMS, FDA, DOD, CDC) Data standards updated 'in real time" through networks National repository of images and samples Critical national "problem list" Most efficient network funding mechanisms in place across NIH |
| Create NIH standards to provide "safe haven" for clinical research Inventory and evaluate existing public-private partnerships, networks, CR institutions, and regulatory systems Establish FORUM(S) of <u>all</u> stakeholders Establish standards for and pilot creation of a National Clinical Research Corps Demonstration/planning grants to enhance/evaluate/develop model networks | NIH standards for safe haven in place Regulations and ethics harmonized with FDA, CMS Public private partnership mechanisms in place 100,000 members of certified "Clinical Research Corps" Standards shared across NIH | Participation in research is a professional standard (taught in all health professions schools) Study, evaluation and training regarding clinical research a part of every medical school, nursing school, pharmacy school Clinical research practices documented and updated regularly to maintain safe haven Networks provide detailed training about network specific issues |

1-3 years 4-7 years 8-10 years
Time



WINNING the FUTURE



President Barack Obama, Weekly Address
 February 5, 2011
 Rethinking Clinical Trials

Health Care Systems Research Collaboratory



- Pragmatic trial designs
- Electronic health records as core data collection instrument
- Collaboration of ≥2 integrated health systems
 - Seven funded for planning phase in 1st round
 - Three funded in 2nd round

The Collaboratory

Original Charge—from FOA

- "The aim of the HCS Research Collaboratory program is to provide a framework of implementation methods and best practices that will enable the participation of many health care systems in clinical research, not to support a defined health care research network."
- Establish a CC that will provide national leadership and technical expertise in all aspects of research with HCS
- Support the design and rapid execution of a set of high impact Demonstration Projects that will conduct research studies in partnership with the health care delivery systems
- Make available data, tools and resources from these and other project to facilitate a broadened base of research partnerships with HCS

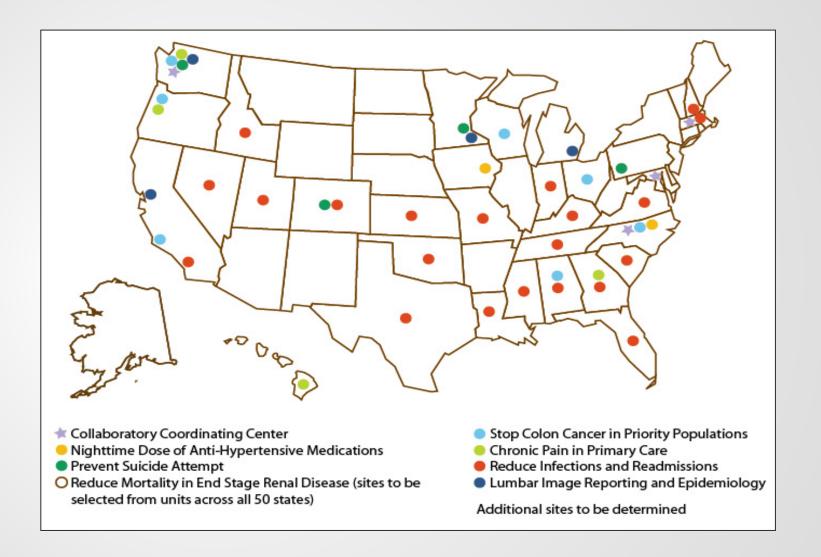
The Collaboratory

High Level Summary

- We have the technical capacity as a country to increase high quality evidence to inform practice by a log order or more
- The NIH HCS Collaboratory is in a great position to assist in the effort by capturing the essence of practical HCS research and providing the knowledge to others
 - Demonstration projects
 - Knowledge repository
 - Proselytizing
- At 18 months every component of the Collaboratory sees a valid and interesting function
- The main limiting factors for widescale implementation will be the regulatory and ethics framework and clinician engagement
- Making the whole greater than the sum of the parts remains a challenge

Demonstration Projects

NIH Health Care System Collaboratory

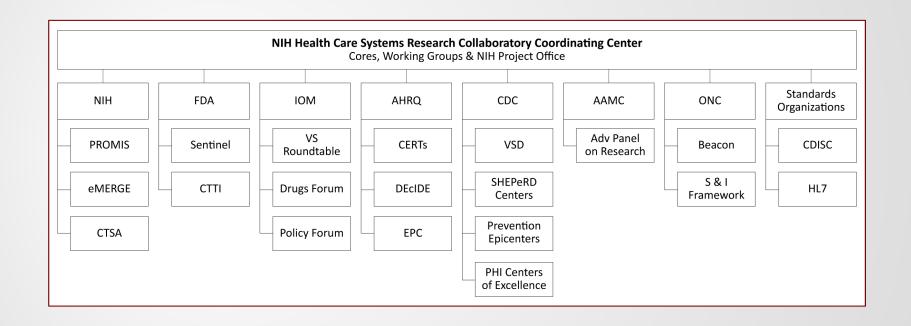


Collaboratory UH2/3 Projects

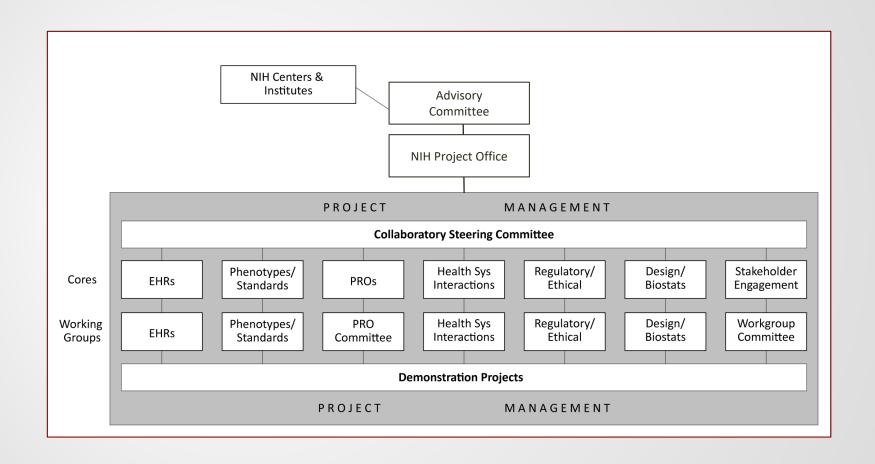
| Project | Full Name | Institution | Project PI |
|------------------------------------|--|------------------------------------|-------------------------|
| LIRE | A Pragmatic Trial of Lumbar Image Reporting with Epidemiology) | University of Washington | Jeffrey Jarvik, MD, MPH |
| ABATE | Active Bathing to Eliminate Infection | UC Irvine | Susan Huang, MD, MPH |
| Suicide & Suicide Prevention | Pragmatic Trial of Population-Based Programs to Prevent Suicide Attempt | Group Health Research Institute | Gregory Simon, MD |
| STOP CRC | Strategies & Opportunities to Stop Colon Cancer in Priority Populations | Kaiser Foundation Hospitals | Gloria Coronado, PhD |
| PPACT | Pain Program for Active Coping and Training | Kaiser Foundation Hospitals | Lynn DeBar, PhD |
| TiME | Time to Reduce Mortality in End- Stage Renal Disease | University of Pennsylvania | Laura Dember, MD |

The Collaboratory

Collaboratory Coordinating Center & Stakeholder Organizations



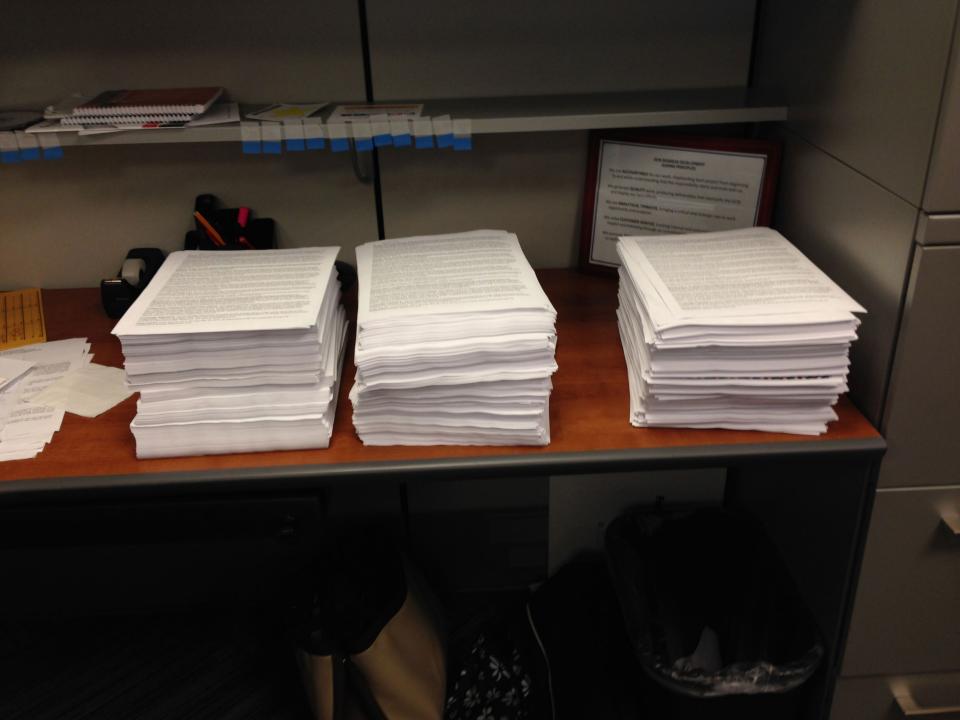
Collaboratory Organization

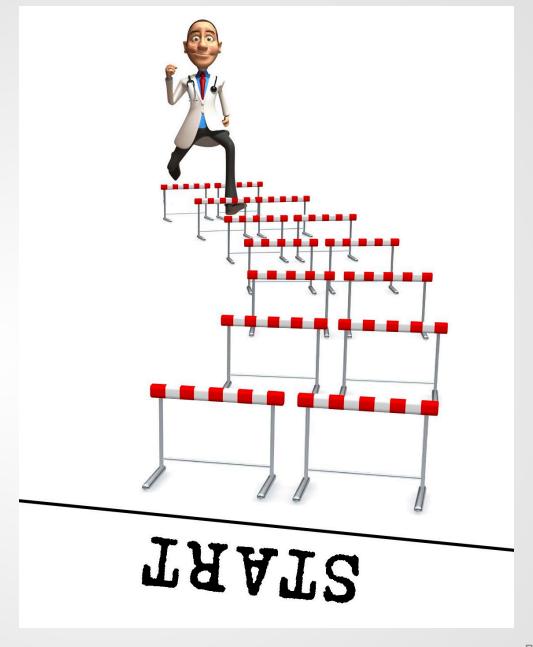


Collaboratory Deliverables

- Demonstration projects
 - All but one has made transition from UH2 to UH3
 - New UH2's with challenge of multisystem comorbidities
 - NIH institutes "catching on"
 - Industry very interested
- Knowledge repository (nihcollaboratory.org)
 - Portal
 - Living text
 - Products of cores/working groups
- Distributed research network







High Hurdles or "Stoppers" for Collaboratory Learning Health System

- Creating environment in which participation is high among providers, patients/families and administrators
- Assuring that data quality is adequate to draw actionable conclusions
- Creating a research data network among evolving health systems
- Consent, regulatory and ethics oversight



Learning health care systems



EVALUATE

Collect data and analyze results to show what works and what doesn't.

ADJUST

Use evidence to influence continual improvement.







In a learning health care system, research influences practice and practice influences research.

DISSEMINATE

Share results to improve care for everyone.



IMPLEMENT

Apply plan in pilot and control settings.

INTERNAL AND EXTERNAL SCAN

Identify problems and potentially innovative solutions.



DESIGN

Design care and evaluation based on evidence generated here and elsewhere.







Internal

7 Proposed Moral Obligations in a Learning Health Care System

- Respect the rights and dignity of patients
- Respect clinician judgments
- Provide optimal clinical care to each patient
- Avoid imposing nonclinical risks and burdens on patients
- Address health inequalities
- Conduct continuous learning activities that improve the quality of clinical care and health care systems
- Contribute to the common purpose of improving the quality and value of clinical care and health care systems
 - Faden RR, Kass NE, et al: Hastings Center Report; Jan 2013
- Introduction and 7 commentaries



Coordinating Center

Ten Ethics/Regulatory Issues that Must Be Resolved for PCTs to Work

- Consent
- Risk determination
- Nature of interventions
- Identifying research participants
- Regulated products
- Institutional review boards
- The research—quality improvement continuum
- Vulnerable subjects
- Data monitoring
- Gatekeepers
- #11—PRIVACY!



NIH Data-Sharing Policies

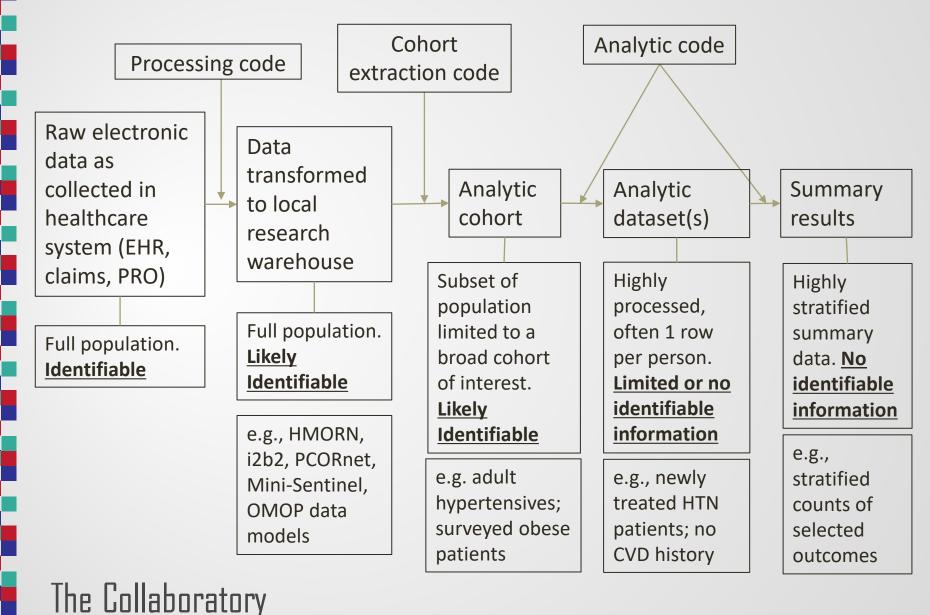
- Privacy of participants should be safeguarded
- Data should be made as widely & freely available as possible
- Data should be shared no later than acceptance for publication of main study findings
- Initial investigators may benefit from first & continuing use of data, but not from prolonged exclusive use

Policy is consistent with clinical research that has monitored data capture under informed consent

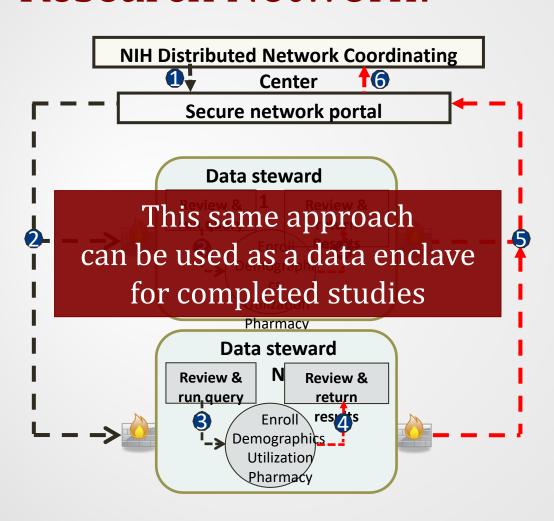
Data Sharing Within Health System Research

- Routinely collected health system data come from wide range of sources linked for analysis
 - Ambulatory facilities, hospitals, pharmacies, health insurers, public registries
- Data are rarely collected under informed consent for research
- Sharing of clinical data used for research requires special consideration
 - Patient privacy issues
 - Healthcare system proprietary & confidentiality issues
- Multi-site studies without central data warehouse raise additional complications

What Data Are Potentially Shareable?

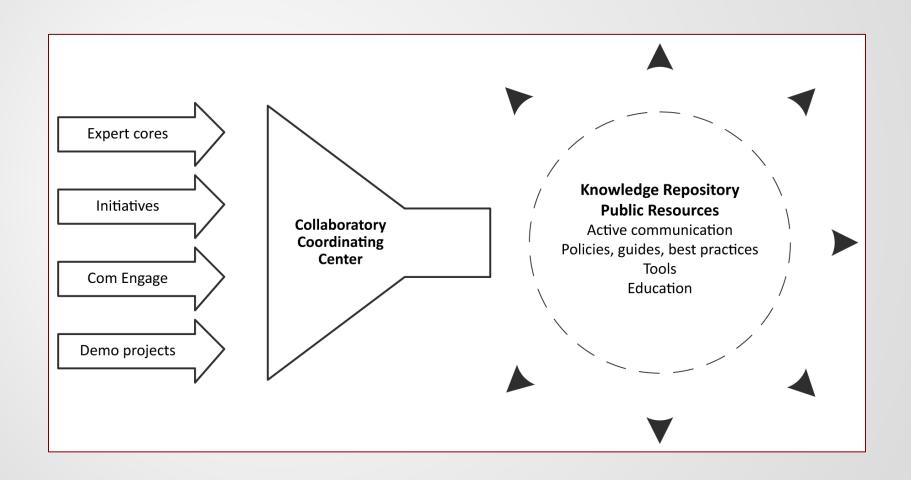


What Is a Distributed Research Network?

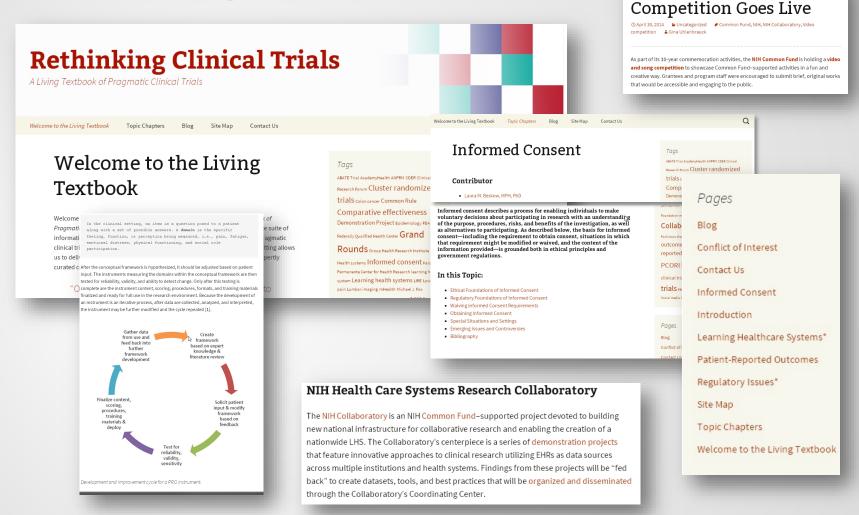


- 1- User creates & submits query (a computer program)
- **2** Data stewards retrieve query
- **3** Data stewards review & run query against local data
- **4** Data stewards review results
- **5** Data stewards return results via secure network
- 6 Results are aggregated

Pathway for Producing Guidelines, Best Practices & Tools



The Living Textbook



https://www.nihcollaboratory.org/wiki/Pages/Home.aspx http://sites.duke.edu/rethinkingclinicaltrials/

NIH Common Fund Video

Lessons Learned

Lessons Learned

- Recognition of opportunity to answer 10 × more questions at 1/10th cost almost universal
- How to get there is less clear, and simple answers do not carry the day
- This highly regulated industry cannot be disrupted without significant willingness to increase creative approaches and take some risks
- Data systems will get there; human systems will be more difficult
- A "UH2 to UH3" approach to clinical research projects seems like a good way to do it
- A "tipping point" will be required in which multiple aspects of this complex system are improved simultaneously

The Future/PCORnet

And The Landscape

POLICY

FOCUS

Network News: Powering Clinical Research

Joseph V. Selby,¹ Harlan M. Krumholz,^{2,3} Richard E. Kuntz,^{3,4} Francis S. Collins^{3,5*}

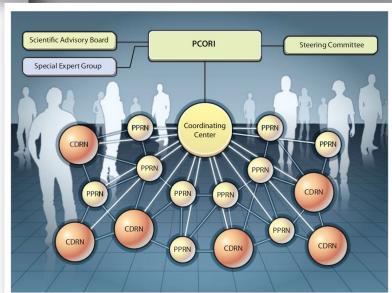
The Patient-Centered Outcomes Research Institute announces bold plans to build a National Patient-Centered Clinical Research Network that will unite millions of patients through a coordinated collaboration with researchers and health care delivery organizations.

NIH Health Care System Research Collaboratory



- Stop Colon Cancer in Priority Populations
- Chronic Pain in Primary Care
- Reduce Infections and Readmissions
- Lumbar Image Reporting and Epidemiology

Additional sites to be determined



Editorial

PCORnet: turning a dream into reality

Francis S Collins, ¹ Kathy L Hudson, ¹ Josephine P Briggs, ² Michael S Lauer³

The Collaboratory

Collaboratory Coordinating Center

selected from units across all 50 states)

Prevent Suicide Attempt

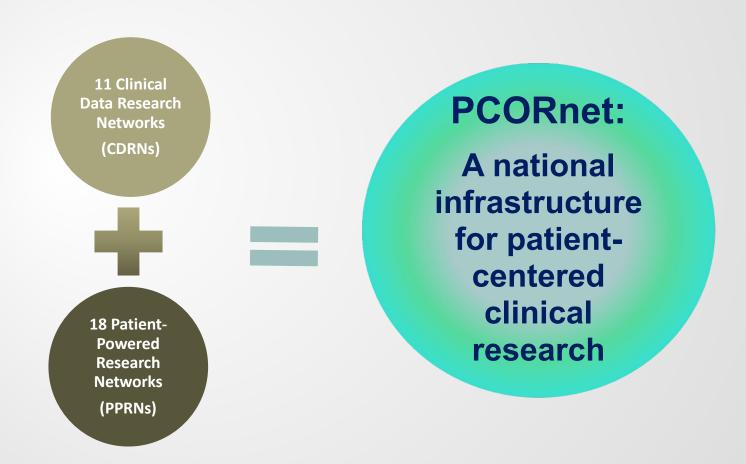
Nighttime Dose of Anti-Hypertensive Medications

Reduce Mortality in End Stage Renal Disease (sites to be

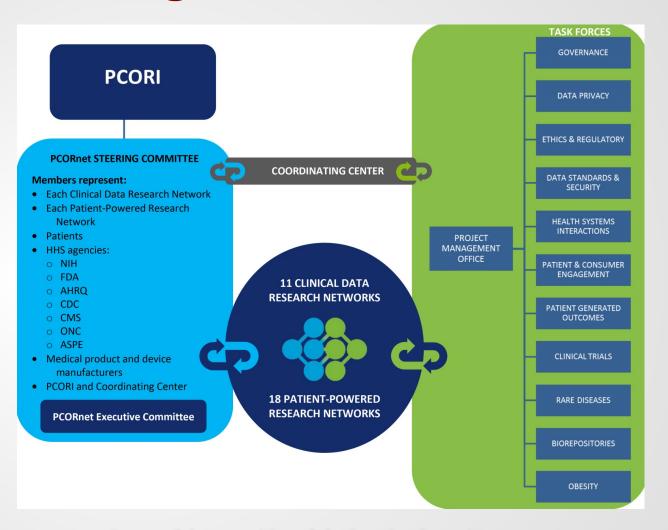
Proposal Word Map: What Are PCORnet Partners Saying?



PCORnet Embodies a "Community of Research" by Uniting Systems, Patients, and Clinicians



PCORnet Organizational Structure



Purposeful composition of the Steering Committee will help ensure that PCORnet influences research funded or conducted by others

[PCORI Strategic Goal #3)

29 Networks Awarded 11 CDRN and 18 PPRN



| CTSA institution | CDRN | PPRN |
|--|--------------------|---|
| Albert Einstein-Montefiore Institute for Clinical and Translational Research | NYC-CDRN | |
| Boston University Clinical and Translational Science (BU-BRIDGE) Institute | SCILHS (childrens) | PARTNERS |
| Case Western University - CTSA | | PARTNERS |
| Clinical and Translational Science Institute at Children's National (DC) | | Partners |
| Columbia University - Irving Institute for Clinical and Translational Research | NYC-CDRN SCILHS | REN |
| Dartmouth University - Clinical and Translational Science Institute | | |
| Duke University – Duke Translational Medicine Institute | | PARTNERS Rare Epilepsy Network (REN) |
| Emory University partnering with Morehouse SOM and Georgia Institute of Technology- Atlanta Clinical & Translational Science Institute (ACTSI) | | PARTNERS Rare Epilepsy Network (REN) SHILS |
| Georgetown and Howard Universities - Center for Clinical and Translational Science | | |
| Harvard University -Catalyst: The Harvard Clinical and Translational Science Center | SCILHS | Many pprn's – see how many you can find! |
| Indiana University School of Medicine - Clinical and Translational Science Institute | | PARTNERS Rare Epilepsy Network(REN) |
| Johns Hopkins University - Institute for Clinical and Translational Research | PaTH | |
| Mayo Clinic - Center for Translational Science Activities | | PARTNERS |
| Medical College of Wisconsin - Clinical and Translational Science Institute of Southeast Wisconsin | GPC | PARTNERS |
| Medical University of South Carolina - South Carolina Clinical & Translational Research Institute | | PARTNERS |
| Mount Sinai School of Medicine - Institutes for Clinical and Translational Sciences | NYC-CDRN | Phelan-McDermid Rare Epilepsy Network (REN) |
| New York University School of Medicine-Health and Hospitals Corporation- Clinical and Translational Science Institute | NYC-CDRN | PARTNERS |
| Northwestern University - Clinical and Translational Sciences Institute | CAPriCORN | |
| Oregon Health and Science University - Clinical and Translational Research Institute | ADVANCE | |
| Penn State S. Hersey University - Clinical and Translational Science Institute | PaTH | PARTNERS |
| Stanford University - Center for Clinical and Translational Education and Research | | ALD connect Rare Epilepsy Network(REN) |
| The Ohio State University Center for Clinical and Translational Science | | Rare Epilepsy Network(REN) |
| The Rockefeller University Center for Clinical and Translational Science | NYC-CDRN | |
| The Scripps Research Institute - Translational Science Institute | | SAPCON |
| The University of Alabama Birmingham - Center for Clinical and Translational Science | | AR-PoWER PARTNERS Rare Epilepsy Network (REN) |
| The University of North Carolina at Chapel Hill - Translational and Clinical Sciences (TraCS) Institute | | COPD ImproveCareNow (Crohn's/Ulcerative Colitis) PARTNERS Rare Epilepsy Network (REN) |
| The University of Texas Health Science Center at San Antonio Institute for Integration of Medicine and Science (IIMS) | | Crohn's/Colitis (CCFA) Rare Epilepsy Network (REN) |
| The University of Utah - Center for Clinical and Translational Science | | PARTNERS Rare Epilepsy Network (REN) |
| | | |

| CTSA institution | CDRN | PPRN |
|---|-----------------------------|---|
| Tufts University - Clinical and Translational Science Institute | CAPriCORN | Crohn's/Colitis (CCFA) Rare Epilepsy Network (REN) |
| University of Arkansas for Medical Sciences Translational Research Institute | | Rare Epilepsy Network (REN) |
| University of California Los Angeles - Clinical and Translational Science Institute | pSCANNER | DuchenneConnect ALD connect PARTNERS |
| University of California, Davis - Clinical and Translational Science Institute | pSCANNER | Genetic Alliance (CENA) Health eHeart Alliance Rare Epilepsy Network (REN) |
| University of California, Irvine - Clinical and Translational Science Institute | pSCANNER | Rare Epilepsy Network (REN) |
| University of California, San Diego - Clinical and Translational Science Institute | pSCANNER | Rare Epilepsy Network (REN) |
| University of California, San Francisco - Clinical and Translational Science Institute | pSCANNER | Health eHeart AllianceGenetic Alliance (CENA) PARTNERS |
| University of Chicago Institute for Translational Medicine | CAPriCORN | COPD PARTNERS |
| University of Cincinnati Center for Clinical and Translational Science and Training | PEDSNet SCILHS (childrens) | ImproveCareNow PARTNERS |
| University of Colorado - Clinical and Translational Sciences Institute | | PARTNERS Rare Epilepsy Network (REN) |
| University of Florida Clinical and Translational Science Institute | | PARTNERS |
| University of Illinois at Chicago Center for Clinical and Translational Science | CAPriCORN | COPD (Jerry Krishnan) PARTNERS |
| University of Iowa Institute for Clinical and Translational Science | Greater Plains (GPC) | PARTNERS Rare Epilepsy Network (REN) |
| University of Kansas - Frontiers: The Heartland Institute for Clinical and Translational Research | Greater Plains (GPC) | PARTNERSRare Epilepsy Network (REN) |
| University of Kentucky Research Foundation - Center for Clinical and Translational Science | | PARTNERS Rare Epilepsy Network (REN) |
| University of Massachusetts Medical Center - Center for Clinical and Translational Science | SCILHS (Mass General) | Mood PPRN ALD Connect |
| University of Miami - Clinical and Translational Science Institute | | Crohn's/Colitis (CCFA) Rare Epilepsy Network (REN) |
| University of Michigan - Institute for Clinical and Health Research | | NephCure ALD Connect PARTNERS Rare Epilepsy Network (REN) |
| University of Minnesota Clinical and Translational Science Institute | Greater Plains (GPC) | ALD connect PARTNERS |
| University of New Mexico Clinical and Translational Science Center | | Rare Epilepsy Network (REN) |
| University of Pennsylvania Institute for Translational Medicine and Therapeutics | PEDSNet (CHOP)?? | Vasculitis PPRN |
| University of Pittsburgh Clinical and Translational Science Institute | PaTH | Crohn's/Colitis (CCFA) |
| University of Rochester Clinical and Translational Sciences Institute | | SAPCON |
| University of Southern California Clinical and Translational Science Institute | | Rare Epilepsy Network (REN) |
| University of Texas Houston Center for Clinical and Translational Sciences | SCILHS | |
| University of Texas Medical Branch - Institute for Translational Sciences | Greater Plains (GPC) | |
| University of Texas Southwestern Center, Dallas, for Translational Medicine | Greater Plains (GPC) | |
| University of Washington - The Institute of Translational Health Sciences at the University of Washington | | Crohn's/Colitis (CCFA) COPD Rare Epilepsy Network (REN |
| University of Wisconsin - Madison Institute for Clinical and Translational Research | Greater Plains (GPC) | |
| Vanderbilt University and Meharry medical College - Institute for Clinical and Translational Research | CAPriCORN Mid-South CDRN | PARTNERS Rare Epilepsy Network (REN) |
| Virginia Commonwealth University - Center for Clinical and Translational Research | | PARTNERS |
| Washington University Institute of Clinical and Translational Sciences | | PARTNERS |
| Weill Cornell Medical College - CTSA | NYC-CDRN | |
| Yale University - Center for Clinical Investigation | | SAPCON |

WINNING the FUTURE



"To win the future, America needs to out-educate, out-innovate, and out-build the rest of the world."

President Barack Obama Weekly Address February 5, 2011

The Collaboratory



To practice evidence-based medicine