JOHNS HOPKINS
MEDICINE

(Patient-Centered)
Comparative Effectiveness Research

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Doctor, should I be taking aspirin to prevent a heart attack? I know that I have some worrisome risk factors…

Should I?

We all want to get the right treatment to the right patient at the right time.

Comparative effectiveness research generates the evidence to inform the decisions that we make as clinicians, and as payers, and as patients.

A Definition of Comparative Effectiveness Research

"... the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care. The purpose of CER is to assist consumers, clinicians, purchasers and policy makers to make informed decisions that will improve health care at both the individual and population levels."

Institute of Medicine, 2009

Questions, questions, questions

What do patients want to know …

Questions, questions, questions

What do patients want to know …

- Should I take aspirin?
- Should I start mammography now at age 40?
- Should I have my cancerous prostate removed or will I be safe just waiting for a bit?
- Should I take warfarin or one of the newer medicines to treat my blood clot?

Questions, questions, questions

What do doctors want to know …

Questions, questions, questions

What do doctors want to know …

- Should I use the robot in this hysterectomy or the usual open method?
- Should I recommend colonoscopy or are the new DNA-based stool cards adequate?
- Are the new medicines for diabetes better than metformin, which I always prescribe?

Questions, questions, questions

What does Medicare want to know…

Questions, questions, questions

What does Medicare want to know…

- Should we cover implantable defibrillators?
- Should we cover home care services after hip replacements?
- How often should we cover geriatrician visits for residents in nursing homes?

BASIC RESEARCH

CLINICAL RESEARCH

POPULATION -BASED RESEARCH

HEALTH SERVICES RESEARCH

Comparative effectiveness research

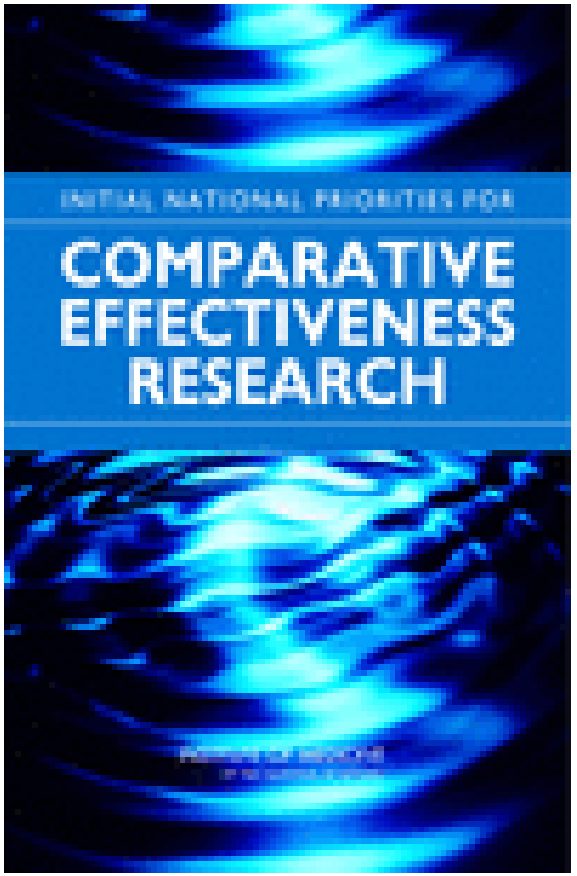
Translational research studies how best to move evidence across the research continuum, from the lab bench to the patient's bedside, and from there to the "curbside" – communities where patients and their families live, learn, work, and play. The faster the uptake of credible evidence, the quicker health care and health may improve, and the greater the returns on the nation's research investment.

Why is this Research Important?

- Many important health care decisions have little scientific evidence
- Quality and value is uncertain
- Economic implications of increasing health care spending
- Slow translation into practice of evidence-based practices

What should be studied?

- The Institute of Medicine (IOM) was tasked with considering priorities for CER research funding (2009)
- IOM panel prioritized 100 research questions into 4 quartiles



Compare the effectiveness of management strategies for localized prostate cancer (e.g., active surveillance, radical prostatectomy [conventional, robotic, and laparoscopic], and radiotherapy [conformal, brachytherapy, proton-beam, and intensity-modulated radiotherapy]) on survival, recurrence, side effects, quality of life, and costs.

Establish a prospective registry to compare the effectiveness of treatment strategies for low back pain without neu

Compare the effectiveness of management strategies for ductal carcinoma in situ (DCIS)

Con anagement strategies (e.g., pha logic and social/family support) for dem

Con c treatments in managing behavioral diso home and institutional settings.

Compare the effectiveness of school-based interventions involving meal programs, vending machines, and physical education, at different levels of intensity, in preventing and treating overweight and obesity in childre and adolescents.

Compare the effectiveness of various strategies (e.g., clinical interventions, selected social interventions [suc as improving the built environment in communities and making healthy foods more available], combined clinical and social interventions) to prevent obesity, hypertension, diabetes, and heart disease in at-risk populations such as the urban poor and American Indians.

Compare the effectiveness of manageme

Establish a registry to compare the effectiveness of treatment strategies for low back pain

Compare the effectiveness of imaging tec cancer including positron emission tomog d tomography (CT).

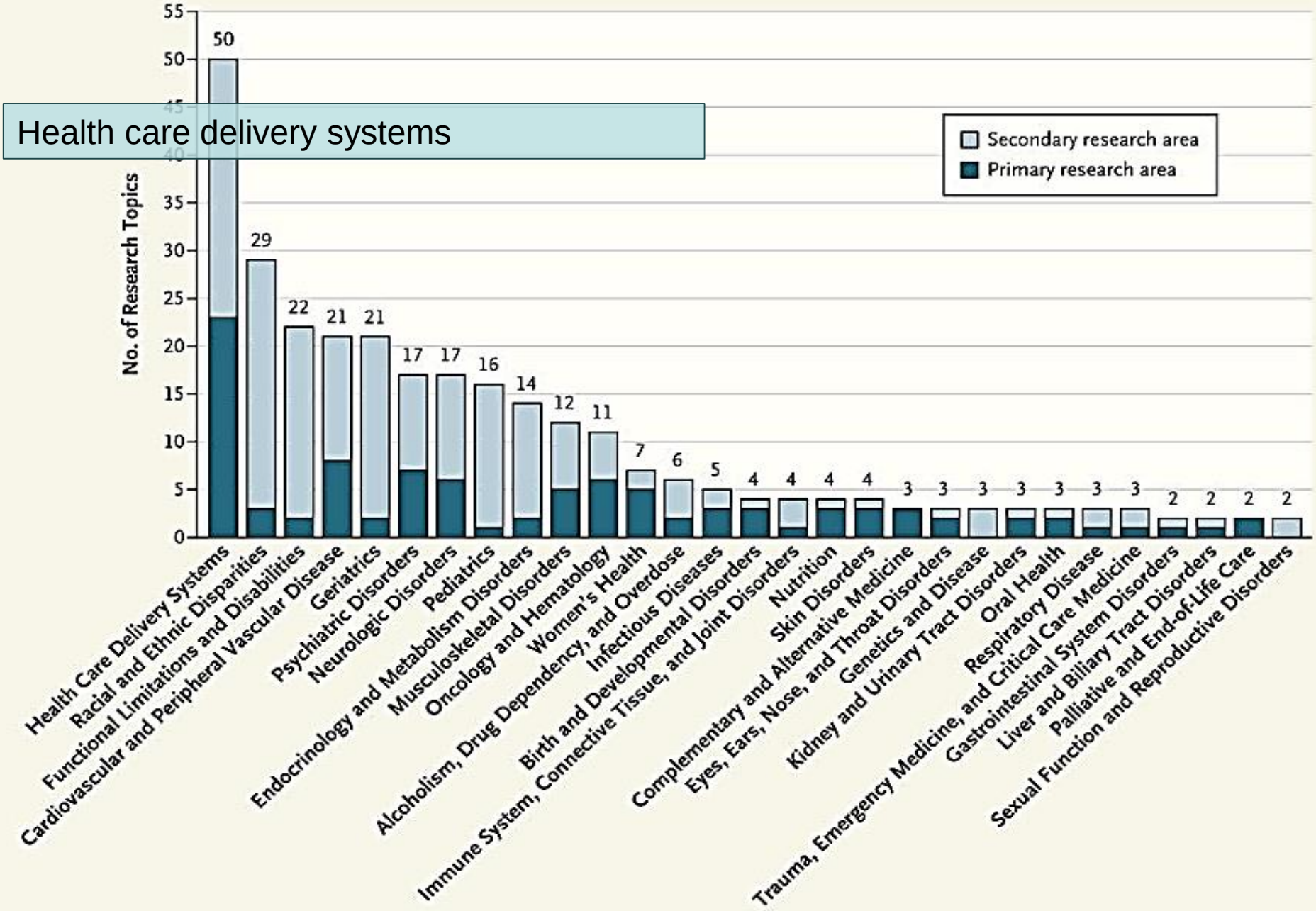
Compare the effectiveness of genetic and east, colorectal, prostate, lung, and ovarian cancer, and possibly other clinical conditions for which promising biomarkers exist.

Compare the effectiveness of the various delivery models (e.g., primary care, dental offices, schools, mobile vans) in preventing dental caries in children.

Compare the effectiveness of various primary care treatment strategies (e.g., symptom management, cognitive behavior therapy, biofeedback, social skills, educator/teacher training, parent training, pharmacologic treatment) for attention deficit hyperactivity disorder (ADHD) in children.

Compare the effectiveness of wraparound home and community-based services and residential treatment in managing serious emotional disorders in children and adults.

Health care delivery systems



Who funds this research?

Agency for Healthcare Research and Quality - AHRQ (1999)

AHRQ (in HHS) is the only federal research agency with the sole purpose of producing evidence to make health care safer; higher quality; more accessible, equitable, and affordable; and to ensure that the evidence is understood and used.

Committed to training the next generation of comparative effectiveness researchers.

Patient Centered Outcomes Research Institute (2010)

PCORI funds research that will help patients choose healthcare options that best meet their needs.

Funds research that advances the quality and relevance of the evidence concerning how disease can effectively be diagnosed, treated, monitored and managed.

Highlighting some comparative effectiveness research and its impact

Comprehensive Unit-based Safety Initiatives

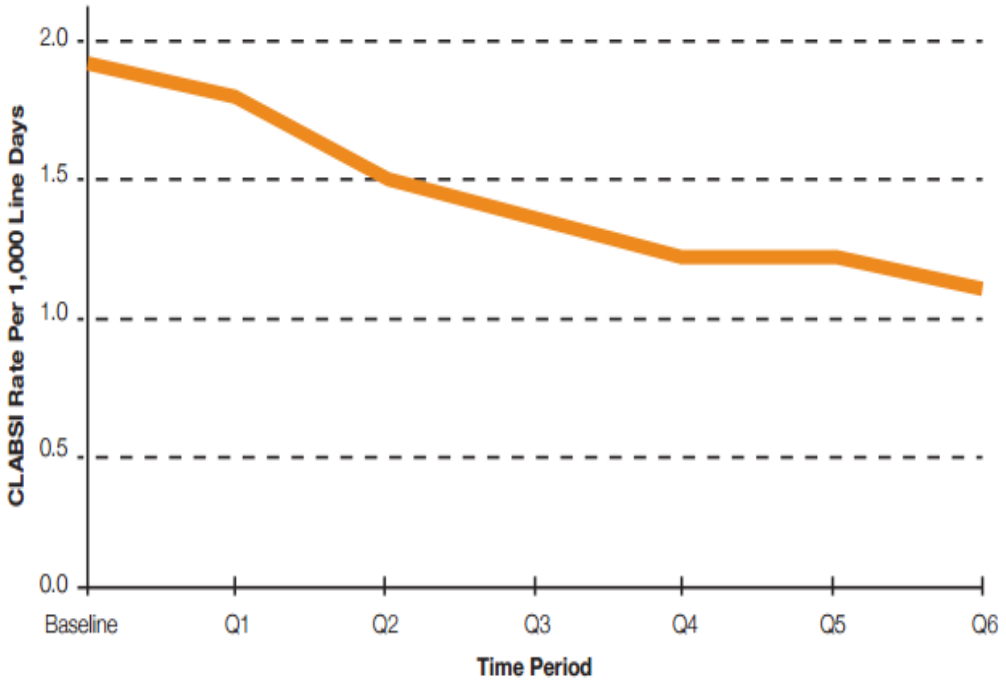
AHRQ invested in Dr. Peter Pronovost's Comprehensive Unit-based Safety Initiative (CUSP) in 2003

He asked … is there a better way to prevent central line infections than what we are doing?

http://healthaffairs.org/blog/2013/09/23/a-national-initiative-to-reduce-central-line-associated-bloodstream-infections-a-model-for-reducing-preventable-harm/

Comprehensive Unit-based Safety Initiatives

The program saved more than 1,500 lives and nearly $200 million in its first 18 months just in Michigan.



Collectively, more than 1,100 hospitals and 1,800 CUSP teams nationwide participated in a national initiative based on Dr. Pronovost's research to eliminate catheter line infections.

Evidence-based Practice Centers

- Since 1998, EPCs have produced >500 comprehensive systematic literature reviews
- Used as the evidence
  - To support the U.S. Preventative Services Task Force recommendations
  - To support professional society guidelines
  - To inform NIH consensus conferences
  - To inform CMS coverage decisions

Effective Health Care Program

Comparative Effectiveness Review
Number 152

JOHNS HOPKINS MEDICINE

Treatment of Nonmetastatic Muscle-Invasive Bladder Cancer

AC

Noninvas
Pain: A Cl
Physician

Amir Qaseem, MI
Guidelines Comm

Description: The
oped this guidelir
recommendations

Methods: Using
these recommend
controlled trials a
2015 on noninva
treatments for low
through Novembe
reduction or elimi
specific and ove
quality of life, rec
global improvem
tween episodes,

Target Audienc
ence for this guid
tient population ir
low back pain.

Recommendatio
subacute low bac
ment, clinicians a
treatment with sup
sage, acupuncture
If pharmacologic
should select no

CLINICAL GUIDELINE

ACP American College of Physicians®
Leading Internal Medicine, Improving Lives

Management of Acute and Recurrent Gout: A Clinical Practice Guideline From the American College of Physicians

Amir Qaseem, MD, PhD, MHA; Russell P. Harris, MD, MPH; and Mary Ann Forciea, MD; for the Clinical Guidelines Committee of the American College of Physicians*

Description: The American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on the management of gout.

Methods: Using the ACP grading system, the committee based these recommendations on a systematic review of randomized, controlled trials; systematic reviews; and large observational studies published between January 2010 and March 2016. Clinical outcomes evaluated included pain, joint swelling and tenderness, activities of daily living, patient global assessment, recurrence, intermediate outcomes of serum urate levels, and harms.

Target Audience and Patient Population: The target audience for this guideline includes all clinicians, and the target patient population includes adults with acute or recurrent gout.

Recommendation 1: *ACP recommends that clinicians choose corticosteroids, nonsteroidal anti-inflammatory drugs (NSAIDs), or colchicine to treat patients with acute gout. (Grade: strong recommendation, high-quality evidence)*

Recommendation 2: *ACP recommends that clinicians use low-dose colchicine when using colchicine to treat acute gout. (Grade: strong recommendation, moderate-quality evidence)*

Recommendation 3: *ACP recommends against initiating long-term urate-lowering therapy in most patients after a first gout attack or in patients with infrequent attacks. (Grade: strong recommendation, moderate-quality evidence)*

Recommendation 4: *ACP recommends that clinicians discuss benefits, harms, costs, and individual preferences with patients before initiating urate-lowering therapy, including concomitant prophylaxis, in patients with recurrent gout attacks. (Grade: strong recommendation, moderate-quality evidence)*

Ann Intern Med. 2017;166:58-68. doi:10.7326/M16-0570 www.annals.org
For author affiliations, see end of text.
This article was published at www.annals.org on 1 November 2016.

Viewpoint page 2519 and Editorial page 2529

Author Audio Interview at jama.com

Related articles pages 2576 and 2595 and JAMA Patient Page pages 2635 and 2636

CME Quiz at jamanetworkcme.com

Related articles at jamaoncology.com jamainternalmedicine.com

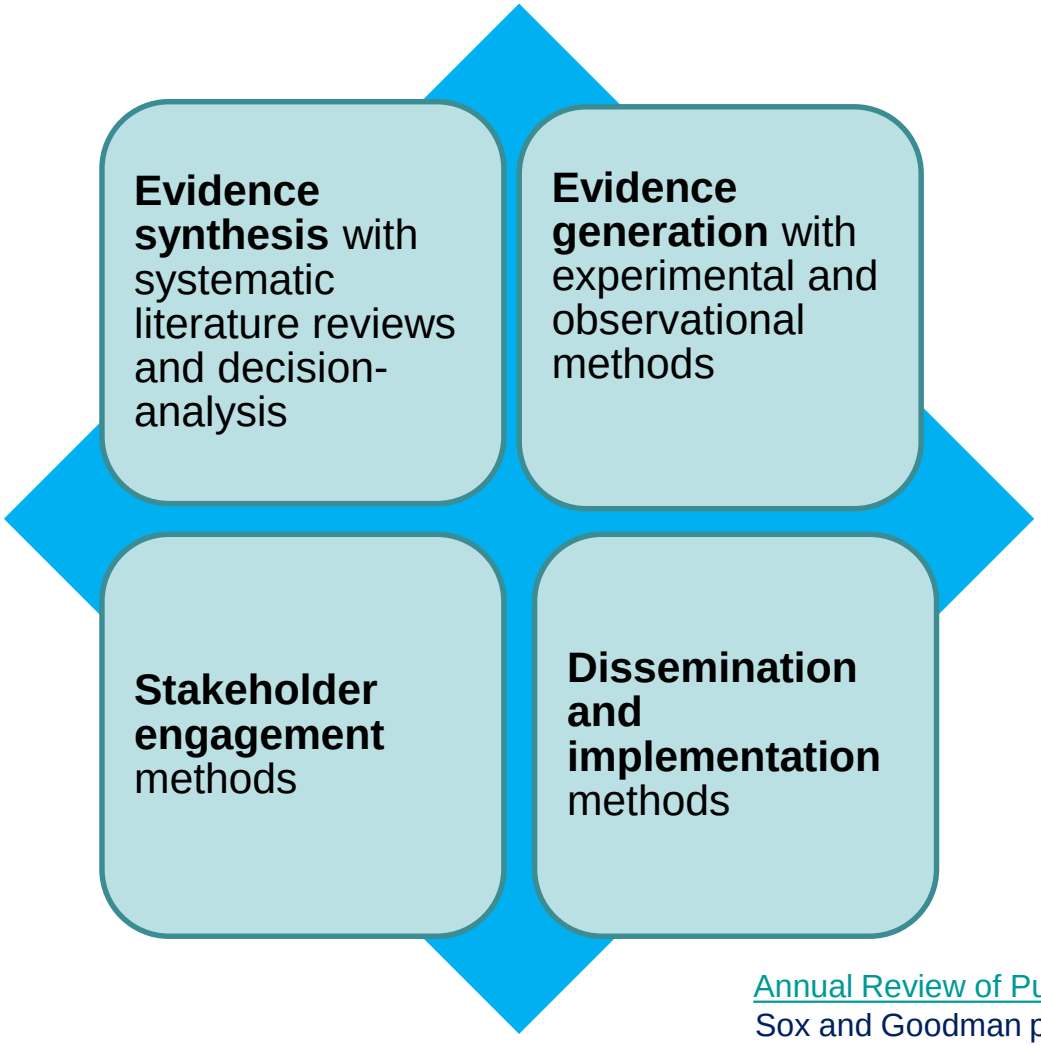
Gout, one of the most common forms of inflammatory arthritis, is caused by accumulation of excess urate crystals (monosodium urate) in joint fluid, cartilage, bones, tendons, bursas, and other sites. Patients experience joint swelling and pain during gout attacks, known as acute gouty arthritis. In some patients, the frequency and duration of acute attacks increase over time and lead to chronic gout, which may be associated with deposits of uric acid crystals known as tophi. Risk factors for gout include overweight or obesity; hypertension; alcohol intake; diuretic use; a diet rich in meat

had gout (5). This percentage increased by about 1% in the 10 years before 2007, probably because of a parallel increase in conditions associated with hyperuricemia. An estimated $1 billion is spent annually on ambulatory care for gout, largely on treatments and prescription medications (6).

Management of gout includes both pharmacologic and nonpharmacologic approaches. Pharmacologic therapies focus on urate-lowering strategies and anti-inflammatory drugs (Table 1). Nonpharmacologic man-

uthor/Group Information: The SPSTF members are listed at the

Key Research Methodologies



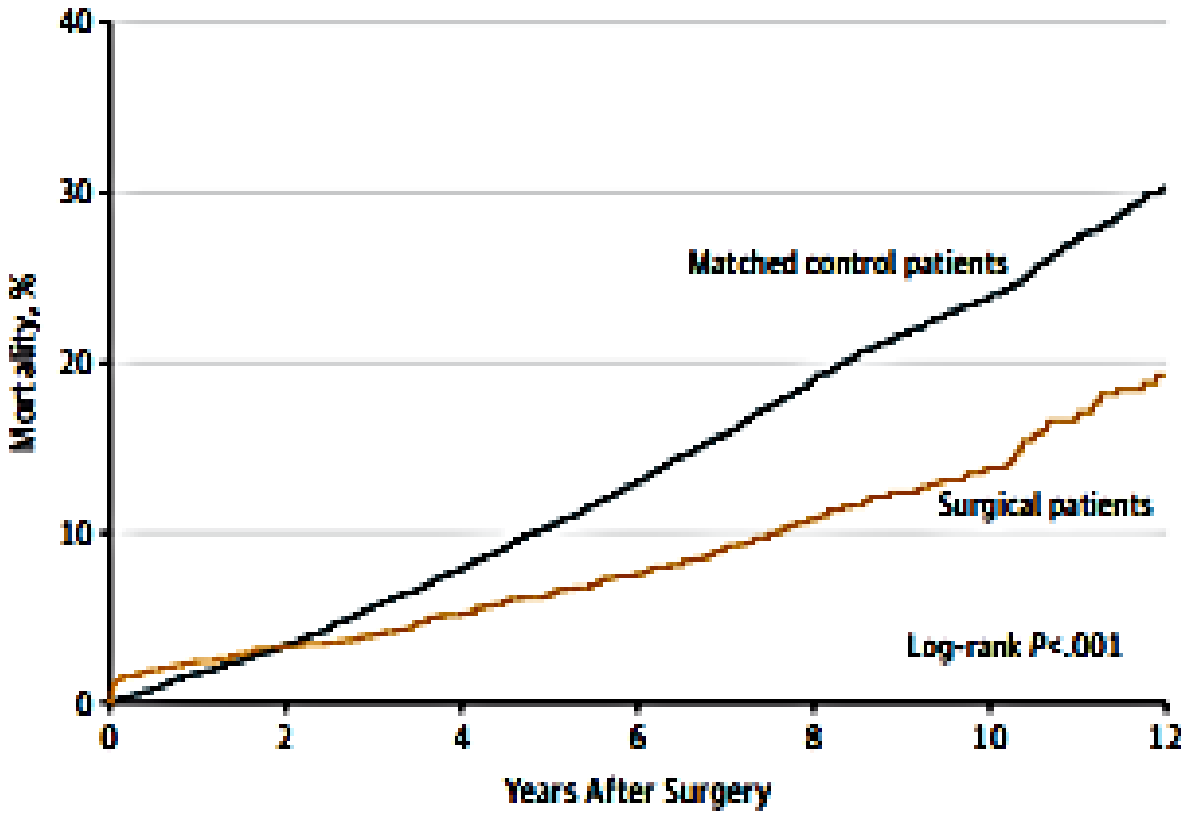
Annual Review of Public Health Volume 33, 2012
Sox and Goodman pp 425-445

Generates Important Results for Medical Practice

- From VA's Surgical Quality Improvement Program (VASQIP)
- Is bariatric surgery more effective at preventing deaths than usual care (no surgery) in morbidly obese veterans?

Figure. Kaplan-Meier Estimated Mortality Curves for Surgical Patients and Matched Control Patients

Investigators identified 2,500 Veterans (74% male) who underwent bariatric surgery in VA bariatric centers



No. at risk							
Matched control patients	7462	7114	5306	3878	2641	1407	472
Surgical patients	2500	2416	1868	1412	1004	552	185

JAMA. 2015;313(1):62-70

Generates Important Results for Medical Practice

JOHNS HOPKINS MEDICINE

Original Investigation

Comparative Effectiveness of Intravenous vs Oral Antibiotics for Postdischarge Treatment of Acute Osteomyelitis in Children

JAMA Pediatr. 2015;169(2):120-128. doi:10.1001/jamapediatrics.2014.2822
Published online December 15, 2014.

Are oral antibiotics as good as intravenous antibiotics after hospital discharge?

Children treated with antibiotics by mouth did NOT have more treatment failures than those treated with antibiotics intravenously.

Far fewer adverse events requiring trips to the emergency room.

Pragmatic Trial Infrastructure

PCORNet

- **Clinical Data Research Networks (CDRNs)** are system-based networks that originate in healthcare systems
- **Patient-Powered Research Networks (PPRNs)** are networks operated and governed by groups of patients and their partners.

Example:

PaTH is a Clinical Data Research Network comprised of:

- Geisinger Health System
- Johns Hopkins
- Penn State College of Medicine
- Temple University's Lewis Katz School of Medicine
- University of Pittsburgh
- University of Utah

ADAPTABLE, the Aspirin Study

- ADAPTABLE (Aspirin Dosing: A Patient-centric Trial Assessing Benefits and Long-Term Effectiveness): 3 year pragmatic trial to compare the effectiveness of different doses of aspirin to prevent heart attacks and strokes in individuals living with heart disease

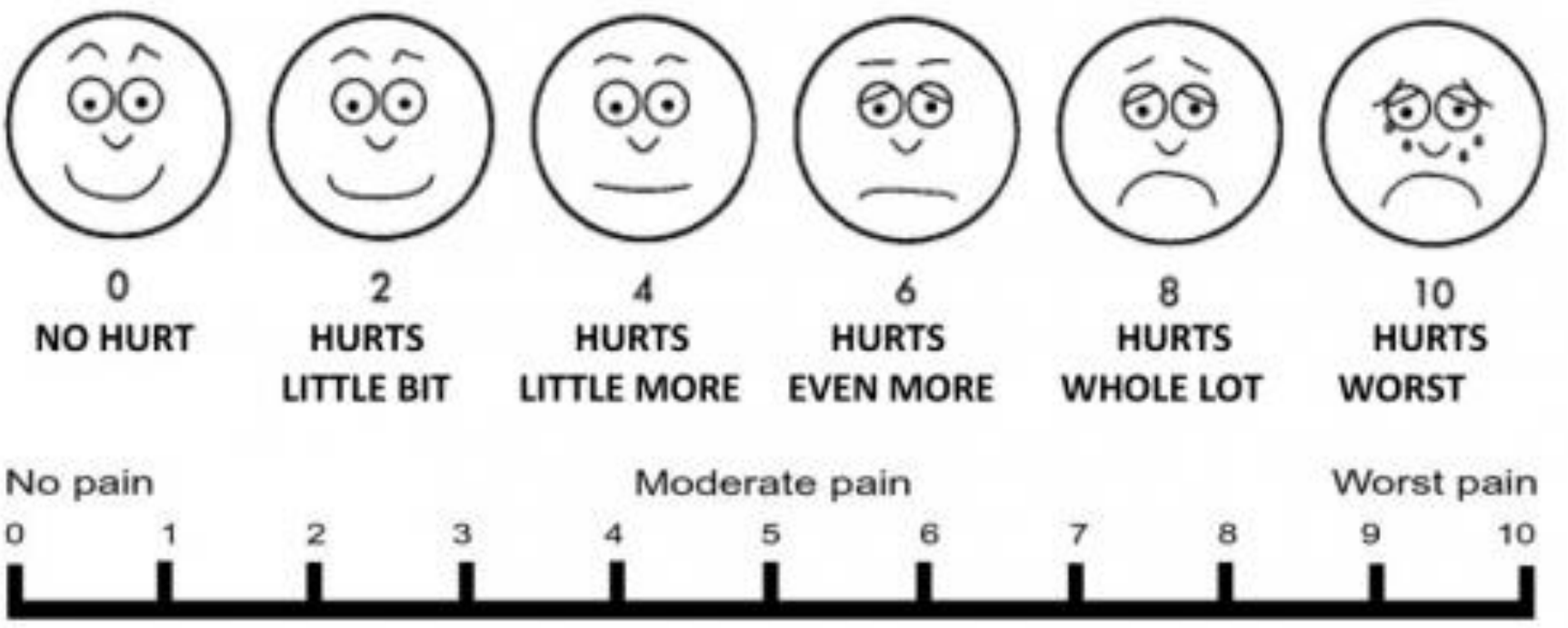
- Embeds the trial into the usual healthcare setting, and leverages data from health systems to produce results that can be readily used to improve patient care.

What Outcomes are Important

- Clinical trials do not always measure outcomes that patients consider important or relevant.
- Makes it hard to know the value of an intervention to patients
- Patient-Centered Outcome Measures (PCOM) are measures that assess the impact of the disease and treatment on patients

Examples

PAIN



THE HAMILTON RATING SCALE FOR DEPRESSION

(to be administered by a health care professional)

Patient's Name _____

Date of Assessment _____

To rate the severity of depression in patients who are already diagnosed as depressed, administer this questionnaire. The higher the score, the more severe the depression.

For each item, write the correct number on the line next to the item. (Only one response per item)

1. DEPRESSED MOOD (Sadness, hopeless, helpless, worthless)

_____

0= Absent
1= These feeling states indicated only on questioning
2= These feeling states spontaneously reported verbally
3= Communicates feeling states non-verbally—i.e., through facial expression, posture, voice, and tendency to weep
4= Patient reports VIRTUALLY ONLY these feeling states in his spontaneous verbal and non-verbal communication

2. FEELINGS OF GUILT

_____

0= Absent
1= Self reproach, feels he has let people down
2= Ideas of guilt or rumination over past errors or sinful deeds
3= Present illness is a punishment. Delusions of guilt
4= Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations

3. SUICIDE

_____

0= Absent
1= Feels life is not worth living
2= Wishes he were dead or any thoughts of possible death to self

Others

- Survival
- Out of pocket costs
- Time to return to work

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PROMIS - NIH @promisNIH
Recent article by Jensen on NIH #PROMIS applied cognition in a large #cancer study - Ref @ bit.ly/2oc3eVb
30 Mar

Embed View on Twitter

Researchers

Provides efficient, reliable, and valid assessments of adult and child (pediatric) self-reported health

- FAQs
- PROMIS Instruments Selected References
- PROMIS In Research
- Industry

Clinicians

Provides data about the effect of therapy that cannot be found in traditional clinical measures

- FAQs
- PROMIS for Clinicians
- Select Publications
- Computer Adaptive Test (CAT)

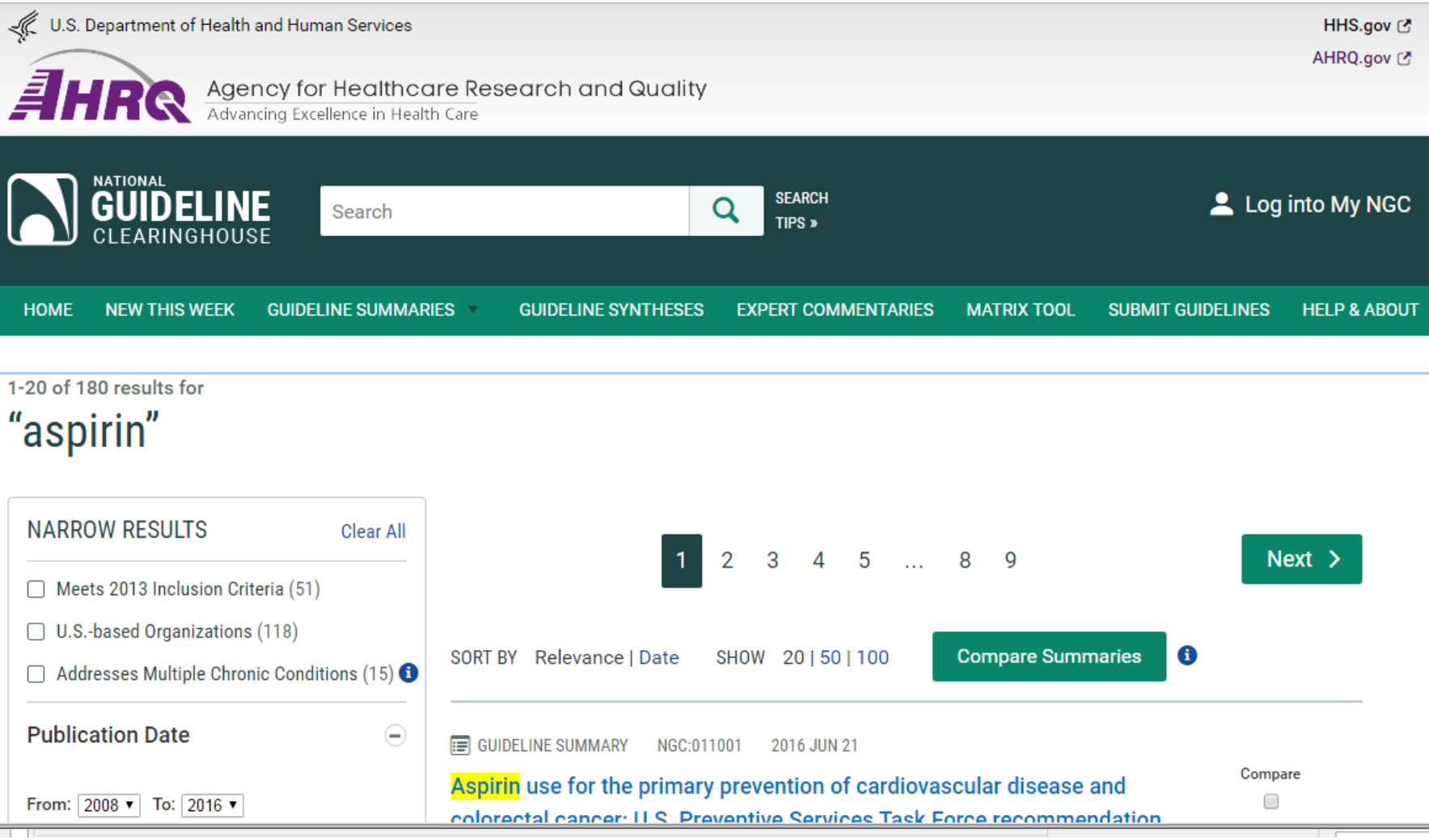
Patients

Measures what you are able to do and how you feel

- More on PROMIS
- What Patient Reported Outcomes (PROs) Are
- PROMIS Measures

Aspirin?

Let me find the evidence…



Evidence Synthesis

Number 131

Aspirin for the Primary Prevention of Cardiovascular Events: A Systematic Evidence Review for the U.S. Preventive Services Task Force

Prepared for:
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
540 Gaither Road
Rockville, MD 20850
www.ahrq.gov

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AHRQ Publication No. 13-05195-EF-1
September 2015

Final Recommendation Statement

Aspirin Use to Prevent Cardiovascular Disease and Colorectal Cancer: Preventive Medication

Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

Table of Contents

Recommendation Summary

Population	Recommendation	Grade (What's This?)
Adults aged 50 to 59 years with a ≥10% 10-year CVD risk	The USPSTF recommends initiating low-dose aspirin use for the primary prevention of cardiovascular disease (CVD) and colorectal cancer (CRC) in adults aged 50 to 59 years who have a 10% or greater 10-year CVD risk, are not at increased risk for bleeding, have a life expectancy of at least 10 years, and are willing to take low-dose aspirin daily for at least 10 years.	B
Adults aged 60 to 69 years with a ≥10% 10-year CVD risk	The decision to initiate low-dose aspirin use for the primary prevention of CVD and CRC in adults aged 60 to 69 years who have a 10% or greater 10-year CVD risk should be an individual one. Persons who are not at increased risk for bleeding, have a life expectancy of at least 10 years, and are willing to take low-dose aspirin daily for at least 10 years are more likely to benefit. Persons	C

Summary

- CER described in the literature since the 1950s
- Pragmatic trials described in the late 1960s (in France)
- Focus on health services research by the VA in the 1970s
- Growing attention to CER in the 1980s with appreciation for “evidence” and rising healthcare costs
- Establishment of AHRQ and later PCORI
- CER recognized as the essential late part of the translational pathway to improved patient outcomes, in a sustainable healthcare system

PCORI Funding

PCORI is funded through the PCOR Trust Fund, which was established by Congress. The PCOR Trust Fund receives income from three funding streams:

- appropriations from the general fund of the Treasury ($120M in FY15)
- transfers from the Centers for Medicare and Medicaid trust funds ($90M in FY15), and
- a $2.26 per covered person per year fee assessed on private insurance and self-insured health plans ($210 M in FY15)