

# Cochrane, Evidence-Based Medicine, and the Evolution of Health Care Practice

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## Evidence-based medicine (EBM)

- Integration of best research evidence with clinical expertise and patient values
- Process of lifelong self-directed learning
- Aims to improve quality of care through the identification and promotion of practices that work, and the elimination of those that don't



Knowledge  
Experience  
Skills

Patient values and  
preferences

Best available evidence

Clinical decisions



# The five-step EBM model

1. Formulating answerable clinical questions
  - What do you want to know
2. Finding the evidence
  - What do the others say
3. Appraising the evidence
  - How good and reliable is their saying
4. Applying the evidence
  - What you learn → What you do
5. Evaluating performance
  - Is it working?





**Cochrane 2014 Annual Report now available**

Read more about what we achieved in 2014 and what we're doing in 2015 and beyond

## Latest News and Events

<p>Thanks to all who helped make the 2015 Colloquium a success!</p> <p>19 October 2015</p>	 <p>Event</p>	<p>Should the Welsh rugby team ditch the big freeze?</p> <p>9 October 2015</p>	 <p>Welsh rugby team ditch...</p> <p>Cochrane in the news</p>
<p>Statement from Cochrane</p> <p>19 September 2015</p>	 <p>Cochrane in the news</p>	<p>Updated list of Cochrane Priority Reviews now available</p> <p>1 October 2015</p>	 <p>Cochrane news</p>

**Latest Cochrane evidence** Top 10

For people with COPD, is it better to take a combination of tiotropium and long-acting  
Updated: 22 October 2015

Risk-scoring systems for the prevention of preterm birth  
Updated: 22 October 2015

Brief versus standard cognitive behavioural therapy for schizophrenia  
Updated: 21 October 2015

No evidence that insertion of drains after plastic and reconstructive surgery of the breast reduces  
Updated: 21 October 2015

Stiripentol for focal refractory epilepsy  
Updated: 21 October 2015

The use of the sodium channel blockers in people with multiple sclerosis (MS)  
Published: 21 October 2015

[See more](#)

# Cochrane: an introduction

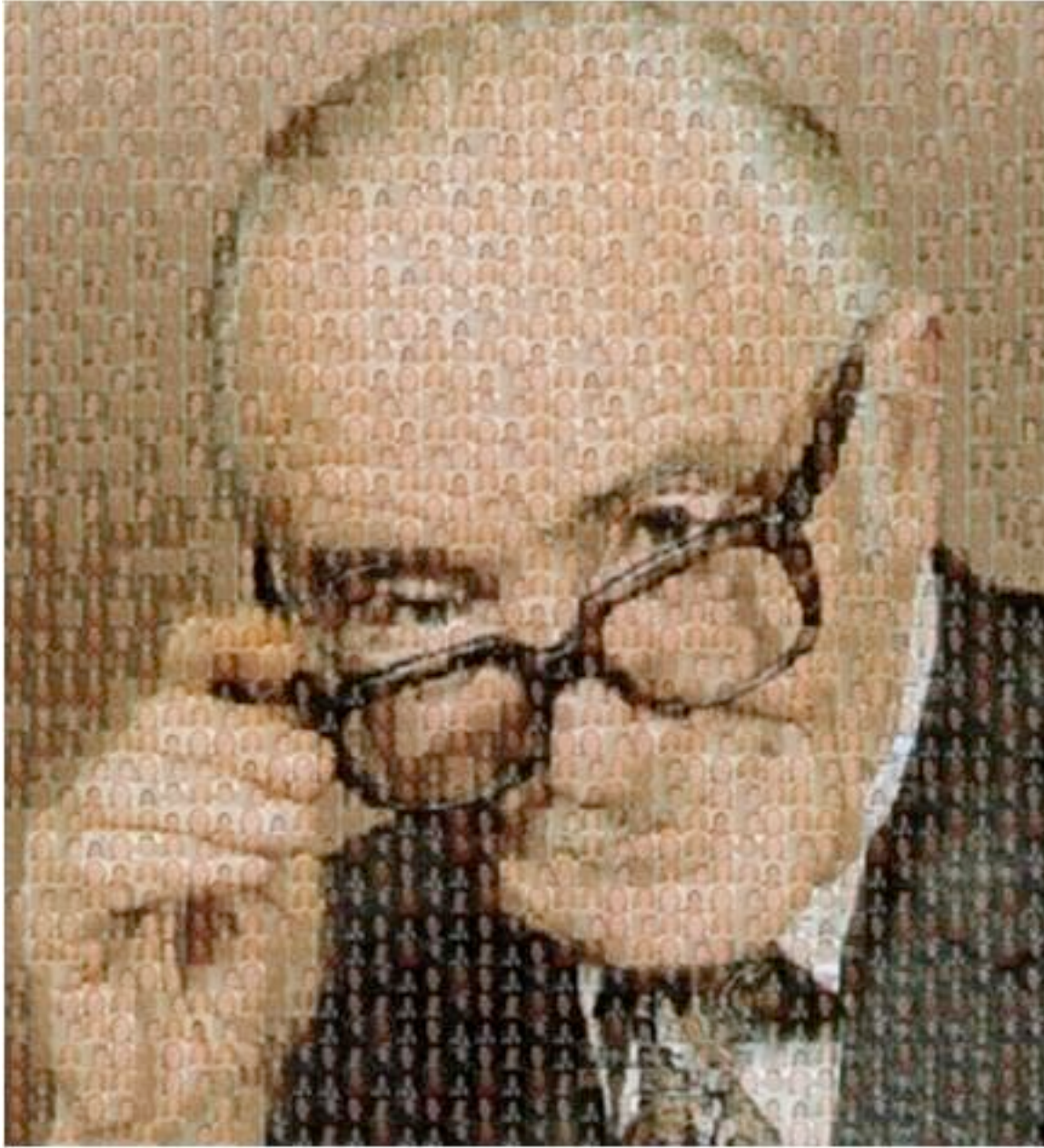
- Formerly called ‘The Cochrane Collaboration’
- Established in 1999 in UK
- A global independent network of researchers, professionals, patients, carers, and people interested in health
- Contributors from more than 120 countries
- Produces credible, accessible health information that is free from commercial sponsorship and other conflicts of interest



# Cochrane: an introduction

- Produces reviews which study all of the best available evidence generated through research and make it easier to inform decisions about health
- Recognized as representing an international gold standard for high quality, trusted information
- Gather and summarize the best evidence from research to help make informed choices about treatment







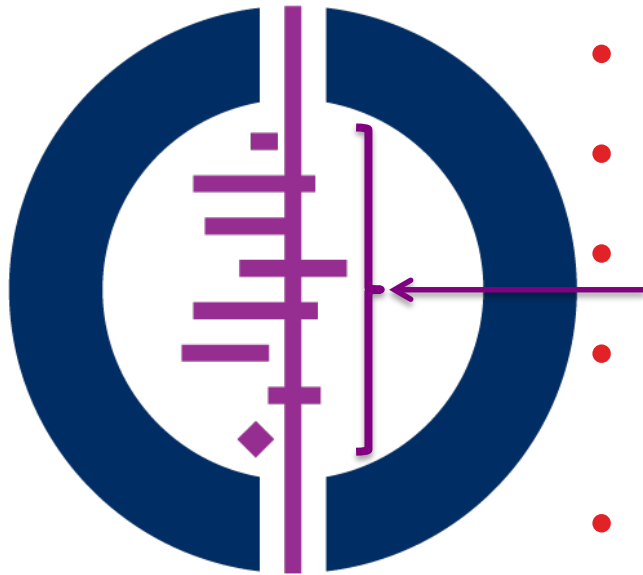
## Cochrane: the name

- Prof. Archie Cochrane, a British epidemiologist stressed the importance of using evidence from randomized controlled trials (RCTs) because these were likely to provide much more reliable information than other sources of evidence

*“It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomized controlled trials”*

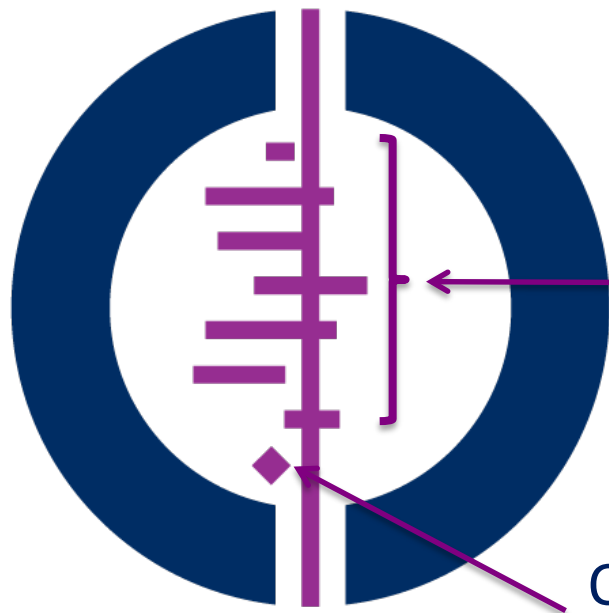


# Cochrane: the logo



- Blue 'C' shapes: **Cochrane Collaboration**
- Purple: Forest plot
- Each horizontal line: Results of one included study
- Vertical line: Line of no effect
- Diamond ◆: Combined result, our best estimate of whether the treatment is effective or harmful
- The diamond sits to the left of the line of no effect: evidence indicates that the treatment is beneficial

## Systematic review of RCTs of a corticosteroid for premature labor



7 RCTs published

1972: First RCT

No systematic reviews on this topic until  
1989

Overall effect estimate: steroids lowered  
mortality by 30-50%

Clinicians were unaware of the precise benefit of steroids for premature labor until this systematic review was published

# Cochrane: vision and mission

- A world of improved health where decisions about health and health care are informed by high-quality, relevant and up-to-date synthesized research evidence
- To promote evidence-informed health decision-making by producing high-quality, relevant, accessible **systematic reviews** and other synthesized research evidence



# What is a systematic review?

- It collates all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question
- It uses explicit, systematic methods that are selected with a view to minimizing bias, thus providing more reliable findings from which conclusions can be drawn and decisions made



# Cochrane Review Groups

- 53 Review Groups
  - Each group has an editorial base
  - Handle entire process of conducting and publishing reviews
  - Specific areas of health care e.g. heart disease, cancer, respiratory diseases
  - First point of contact for authors
  - International and multidisciplinary



# Cochrane Library

- Main output of Cochrane
- A collection of six databases
  1. Cochrane Database of Systematic Reviews (CDSR)
  2. Cochrane Central Register of Controlled Trials (CENTRAL)
  3. Cochrane Methodology Register (CMR)
  4. Database of Abstracts of Reviews of Effects (DARE)
  5. Health Technology Assessment Database (HTA)
  6. NHS Economic Evaluation Database (EED)

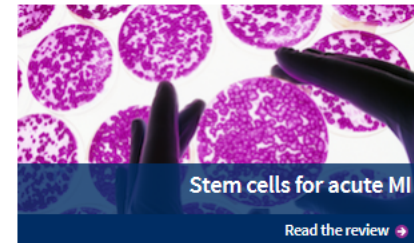




### Vitamin C supplementation in pregnancy

Effects on pregnancy outcomes, adverse events, and use of health resources

[Read the review](#) ➔



### Stem cells for acute MI

[Read the review](#) ➔



### Assisted reproductive technology

[Find out more](#) ➔

Highlighted Reviews

Editorials

Special Collections

#### Chemotherapy for advanced non-small cell lung cancer in the elderly population

Fábio N Santos, Tiago B de Castría, Marcelo RS Cruz, Rachel Riera

20 October 2015

#### Adverse events associated with single dose oral analgesics for acute postoperative pain in adults - an overview of Cochrane reviews

R Andrew Moore, Sheena Derry, Dominic Aldington, Philip J Wiffen

13 October 2015

#### Additional behavioural support as an adjunct to pharmacotherapy for smoking cessation

Lindsay F Stead, Priya Koilpillai, Tim Lancaster

12 October 2015

#### Constraint-induced movement therapy for upper extremities in people with stroke

Davide Corbetta, Valeria Sirtori, Greta Castellini, Lorenzo Moja, Roberto Gatti

8 October 2015



Tell us what you think. We welcome your comments on Cochrane Reviews.



# Key features of a Cochrane systematic review

- A valid clinical question
- Clearly stated objectives
- Pre-defined eligibility criteria
- Explicit, reproducible methods
- Systematic search
- Assessment of validity of included studies
- Data synthesis and presentation of findings



# Steps of a Cochrane systematic review

1. Define the question
2. Plan eligibility criteria
3. Plan methods
4. Search for studies
5. Apply eligibility criteria and select studies
6. Collect and critically appraise data
7. Analyze and present results
8. Interpret results and draw conclusions
9. Update review



# A good systematic review question: PICOS

- Population
- Intervention(s)
- Comparator(s)
- Outcome(s)
- Study design(s)



## Intervention and Comparator

## Outcomes

Higher versus lower humidity for the prevention of morbidity and mortality in preterm infants in incubators

## Population

Lynn Sinclair<sup>1</sup>, John KH Sinn<sup>2</sup>

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**Editorial group:** Cochrane Neonatal Group.

**Publication status and date:** Edited (no change to conclusions), published in Issue 1, 2009.

**Citation:** Sinclair L, Sinn JKH. Higher versus lower humidity for the prevention of morbidity and mortality in preterm infants in incubators. *Cochrane Database of Systematic Reviews* 2007, Issue 2. Art. No.: CD006472. DOI: 10.1002/14651858.CD006472.

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# Steps of a Cochrane systematic review

1. Define the question
2. Plan eligibility criteria
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6. Collect and critically appraise data
7. Analyze and present results
8. Interpret results and draw conclusions
9. Update review



**Review protocol**



# Cochrane protocols

- Systematic reviews involve judgments
  - e.g. question definition, eligibility, outcome measures
  - Retrospective research - decisions should not be based on known results
- Decide and document methods in advance
  - Reduce impact of bias
  - Allow peer review
  - Reduce duplication
  - Plan tasks and allocate resources
  - Published in the Cochrane Library



# Cochrane protocols

- Plan what you will do before you start
- Select methods likely to deliver the best evidence on which to base decisions
  - Eligibility criteria
  - Searching
  - Data collection and management
  - Risk of bias assessment
  - Data analysis
  - Interpretation of findings



# Steps of a Cochrane systematic review

1. Define the question
2. Plan eligibility criteria
3. Plan methods
4. Search for studies
5. Apply eligibility criteria and select studies
6. Collect and critically appraise data
7. Analyze and present results
8. Interpret results and draw conclusions → **Full review**
9. Update review





# Psychological therapies (remotely delivered) for the management of chronic and recurrent pain in children and adolescents

Emma Fisher<sup>1</sup>, Emily Law<sup>2</sup>, Tonya M Palermo<sup>2</sup>, Christopher Eccleston<sup>1</sup>

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**Editorial group:** Cochrane Pain, Palliative and Supportive Care Group.

**Publication status and date:** New, published in Issue 3, 2015.

**Review content assessed as up-to-date:** 3 June 2014.

**Citation:** Fisher E, Law E, Palermo TM, Eccleston C. Psychological therapies (remotely delivered) for the management of chronic and recurrent pain in children and adolescents. *Cochrane Database of Systematic Reviews* 2015, Issue 3. Art. No.: CD011118. DOI: 10.1002/14651858.CD011118.pub2.

## Overview

- Traditional psychological therapies for chronic pain: delivered individually or in groups, face-to-face
- Barriers with access: shortage of providers, cost, geographic distance from treatment centres
- "Technological therapies" e.g. via the Internet, computer-based programmes, smartphone applications, or via the telephone, may be viable alternatives



## Research questions

- Can psychological therapies, delivered remotely using technology, help children and adolescents with chronic pain to have less pain, to improve physical functioning, and to have fewer symptoms of depression and anxiety?
- Are any improvements greater than those reported by children who are waiting to be treated (waiting-list control), or being treated in other ways (active control)?



## Methods & Results

- Literature search through to June 2014
- Included 8 RCTs, number of study participants = 371, average age 12.57 years
- 5 studies treated children with headache
- 1 study treated children with juvenile idiopathic arthritis
- 2 studies included mixed samples of children, some who had headache and some with other chronic pain conditions e.g. recurrent abdominal pain



## Methods & Results

- Remote psychological therapies (primarily via the Internet) reduced severity of pain in children with headache and children with mixed pain conditions post-treatment ( $P < 0.01$  for both populations)
- No effects on physical functioning
- No effects on depression
- No description of adverse events reported in the included studies



## Conclusions

- Very few studies; no much data
- BUT.... this is a growing field and more trials using cognitive behavioral therapy and other psychological therapies are needed to determine the efficacy of remotely delivered therapies



## Before....

- Traditional psychological therapies: delivered individually or in groups, face-to-face



## After....

- Remotely delivered therapies
- "E-Therapy", "E-Health"
  
- Telephone
- Internet
- Smartphone





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# THANK YOU!

