

Systematic Reviews and The Cochrane Library

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Archie Cochrane



"It is surely a great criticism of our profession that we have not organized a critical summary, by specialty, adapted periodically, of all relevant randomized controlled trials." (1979)

Cochrane Collaboration

- A world wide group of health care professionals (October 1993)
- Goal: To prepare, maintain and disseminate, up-to-date reviews by specialty, of all RCTs (or the best available evidence) in all areas of medicine.

Cochrane Review Group

- Group of experts with an interest in a health problem area
- Work to prepare and maintain systematic reviews of specified health care problems
- Willing and able to review all relevant research on specified topic
- Keep it up to date

52 Review Groups

Women's Health:

- Breast Cancer
- Fertility Regulation (Contraception)
- Gynaecologic Cancer
- Incontinence
- Menstrual Disorders & Subfertility
- Neonatal
- Pregnancy & Child Birth

World-wide Network



Cochrane Centres



- Amsterdam
- Australia
- Brazil
- Canada (Ottawa)
- China
- Belgium
- Columbia
- Finland
- Germany
- Italy
- Netherlands
- Norway
- Russia
- South Africa
- Spain
- United Kingdom
- United States
- Venezuela

18 Network Sites



Ontario Sites

(Representatives)

- University of Western Ontario
Currently Vacant (November 23, 2010)
- McMaster University
Currently Vacant
- University of Toronto
Joseph Beyene, Prakesh Shah
- Queen's University
Phil Hahn, Tanveer Towheed
- University of Ottawa
Peter Tugwell, George Wells

Cochrane Colloquium

- 1993 Oxford, United Kingdom
- 1994 Hamilton, Canada
- 1995 Oslo, Norway
- 1996 Adelaide, Australia
- 1997 Amsterdam, The Netherlands
- 1998 Baltimore, USA
- 1999 Rome, Italy
- 2000 Cape Town, South Africa
- 2001 Lyon, France
- 2002 Stavanger, Norway
- 2003 Barcelona, Spain
- 2004 Ottawa, Canada
- 2005 Melbourne, Australia
- 2006 Dublin, Ireland
- 2007 Sao Paulo, Brazil
- 2008 Freiburg, Germany
- 2009 Singapore
- 2010 Keystone, Colorado, USA
- 2011 Madrid, Spain (19-22 October)
- 2012 Nanning, China

Cochrane Symposia (Canada)

- 1999 Hamilton
- 2001 Edmonton
- 2003 Hamilton
- 2005 Montreal
- 2007 Ottawa
- 2008 Edmonton
- 2009 Halifax
- 2010 Ottawa
- 2011 Vancouver



Casa (House) Battlo (1904)

Architect Antoni Gaudi



Barcelona 2003

Ronaldinho



F.C. Barcelona (3)
Real Murcia (0)

Whyte Avenue: Old Stathcona



Edmonton 2008

Coffee Shops
Pubs
Boutiques
Book Stores
Antiques
People



Systematic Review

- Involves the application of scientific strategies, in ways that limit bias, to the assembly, critical appraisal, and synthesis of all relevant studies that address a specific clinical question.

Deborah Cook et al.
Systematic Reviews: Synthesis of Best Evidence for Clinical Decisions. *Annals of Internal Medicine* 1997;126:376-380.

Meta-analysis

- Type of systematic review that uses statistical methods to combine and summarize the results.

Deborah Cook et al.
Systematic Reviews: Synthesis of Best Evidence for Clinical Decisions. *Annals of Internal Medicine* 1997;126:376-380.

Narrative Review

- A summary of research that lacks explicit descriptions of systematic methods.
- Deal with a broad range of issues related to a topic rather than a specific clinical question.
- Summary is most often qualitative (no overall effect size).

Deborah Cook et al.
Systematic Reviews: Synthesis of Best Evidence for Clinical Decisions. *Annals of Internal Medicine* 1997;126:376-380.

Systematic Review... 5 Steps

1. State objective as a focused clinical question.

Three parts:

1. *A patient with a problem*
2. *An intervention or exposure (compared to)*
3. *An outcome*

Systematic Review... 5 Steps

1. State objective as a focused clinical question.

Example:

1. *In women expected to deliver preterm*
2. *do corticosteroids (compared to) placebo*
3. *reduce the incidence of infant mortality and RDS?*

Systematic Review

2. Apply eligibility criteria.

- *Randomized trials only*
- *Corticosteroid drugs*
- *Women expected to deliver preterm as a result of:*
 - *spontaneous preterm labour*
 - *prelabour rupture of the membranes preterm*
 - *elective preterm delivery.*

Systematic Review

3. Search for all studies that meet criteria.

- *Electronic literature search (Medline, Embase)*
- *Hand-search journals*
- *Contact researchers directly for unpublished studies (publication bias)*



Systematic Review

4. Synthesize the results with a meta-analysis (if appropriate)

Using Review Manager (RevMan)

Systematic Review

5. Prepare a structured report for inclusion into the Cochrane Database of Systematic Reviews



Updated every 3 months

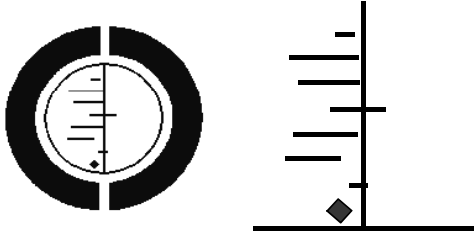
What's in The Cochrane Library?

Issue 4, 2009

- **Cochrane Database of Systematic Reviews**
 - 4,027 complete reviews
 - 1,906 protocols
- **Database of Abstracts of Reviews of Effects (DARE)**
(Other reviews in the literature. Quality-assessed.)
 - 11,447 structured abstract / commentary
- **Controlled Trials Register**
 - 600,472 abstracts



Presentation of Results

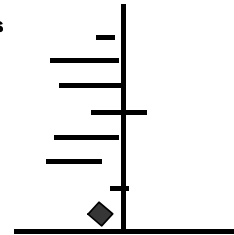


7 RCTs: Corticosteroids for Preterm Delivery Outcome: Neonatal Death

Each horizontal line represents the results of one trial.

The shorter the line the more certain the estimate.

The diamond represents the pooled results.

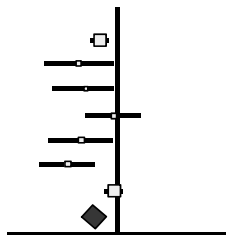


7 RCTs: Corticosteroids for Preterm Delivery Outcome: Neonatal Death

Centre of horizontal line is the point estimate - Odds ratio.

Size of square - Sample size.

The length of the horizontal represents the 95% CI.



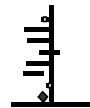
7 RCTs: Corticosteroids for Preterm Delivery Outcome: Neonatal Death

Odds Ratio (OR)

OR = $\frac{\text{odds of an event (death) in treatment group}}{\text{odds of an event (death) in control group}}$

Odds = $\frac{\text{number of times an event occurs}}{\text{number of times an event does not occur}}$

When event rate is small (10% or less)
Odds Ratio is approximately the same as a Relative Risk.



OR versus RR

Corticosteroids versus Placebo

Group:	OUTCOME = DEATH		Total
	Yes	No	
Treatment	129	1641	1770
Control	204	1543	1747

OR versus RR

Corticosteroids versus Placebo

Group:	OUTCOME = DEATH		Total
	Yes	No	
Treatment	129	1641	1770
Control	204	1543	1747

RR = 129/1770 divided by 204/1747 = 0.62

Incidence 7.3% 11.7%

OR versus RR Corticosteroids versus Placebo

Group:	OUTCOME = DEATH		Total
	Yes	No	
Treatment	129	1641	1770
Control	204	1543	1747

OR = 129/1641 divided by 204/1543 = 0.59

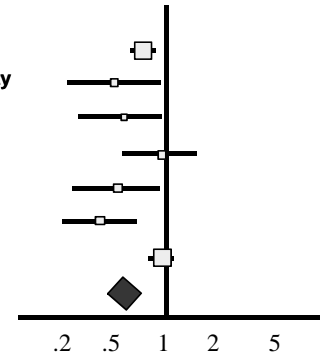
RR = 129/1770 divided by 204/1747 = 0.62

(7.3%)

(11.7%)

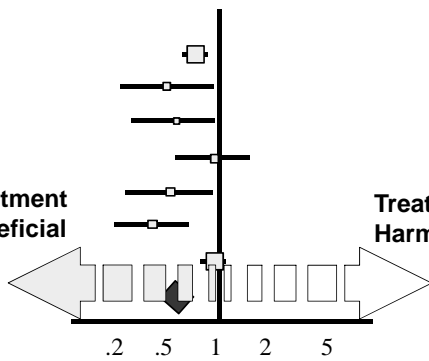
Vertical Line - Line of Unity

OR or RR = 1 (no risk)



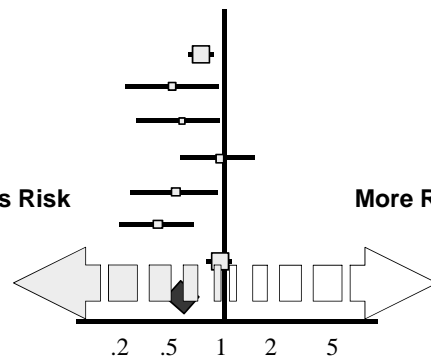
Treatment Beneficial

Treatment Harmful



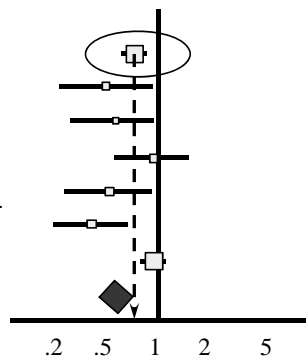
Less Risk

More Risk



Odds ratio of 0.75

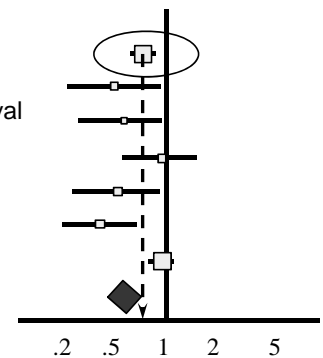
Corresponds to a 25% reduction in the odds of neonatal death attributable to corticosteroid intervention.

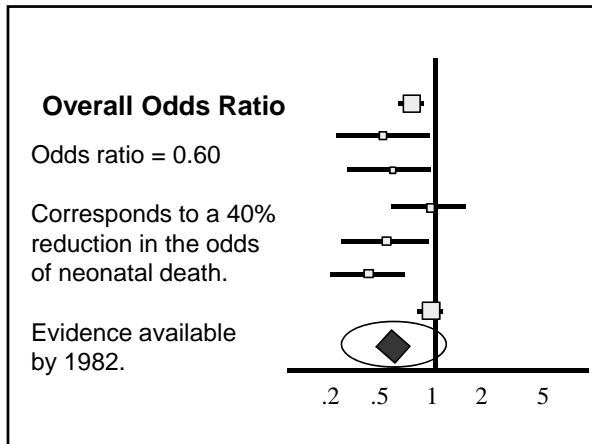


Odds ratio = 0.75

95% Confidence Interval does not cross 1

Result is statistically significant.





- ## Use of Corticosteroids prior to Preterm Delivery
- Systematic Review not published until 1989
 - Oxford Database of Perinatal Trials
 - Many did not realize the treatment was so effective
 - ACOG Committee Opinion (No. 147) December 1994
 - SOGC Committee Opinion March 1995
 - ACOG Committee Opinion (No. 210) October 1998
 - ACOC Committee Opinion (No. 273) May 2003
 - SOGC Committee Opinion (No. 122) January 2003

Cochrane Library

The best single source of reliable evidence about the effects of health care in the world.

