Consulting, interpreting and using first aid research evidence

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Belgian Red Cross

Evidence-based by **CEBaP**

Cochrane First Aid

What is Cochrane First Aid?

Cochrane First Aid

Evidence-based by CEBaP

Belgian Red Cross

- Thematic Field of Cochrane

- Mission:
  - > Forming a global network of people advocating for the development, dissemination and uptake of high-quality evidence on first aid
  - > Promoting the use of evidence on first aid
  - > Form a liaison between science and practice:
    - Provide overview of the best available scientific evidence
    - Monitoring practitioner's needs

Guideline developers

First Aid curriculum developers

First Aid trainers

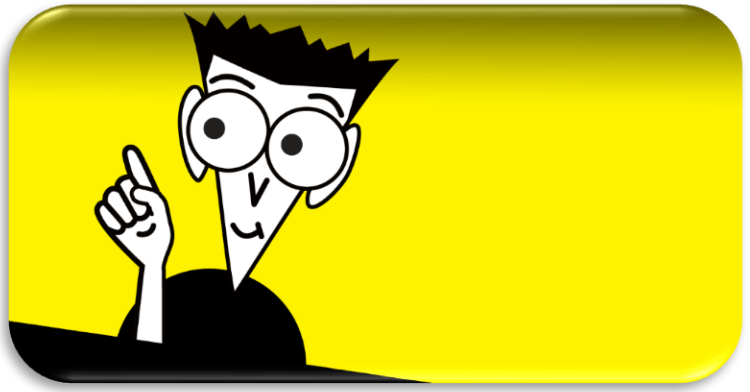
Laypeople performing & receiving first aid

Overview

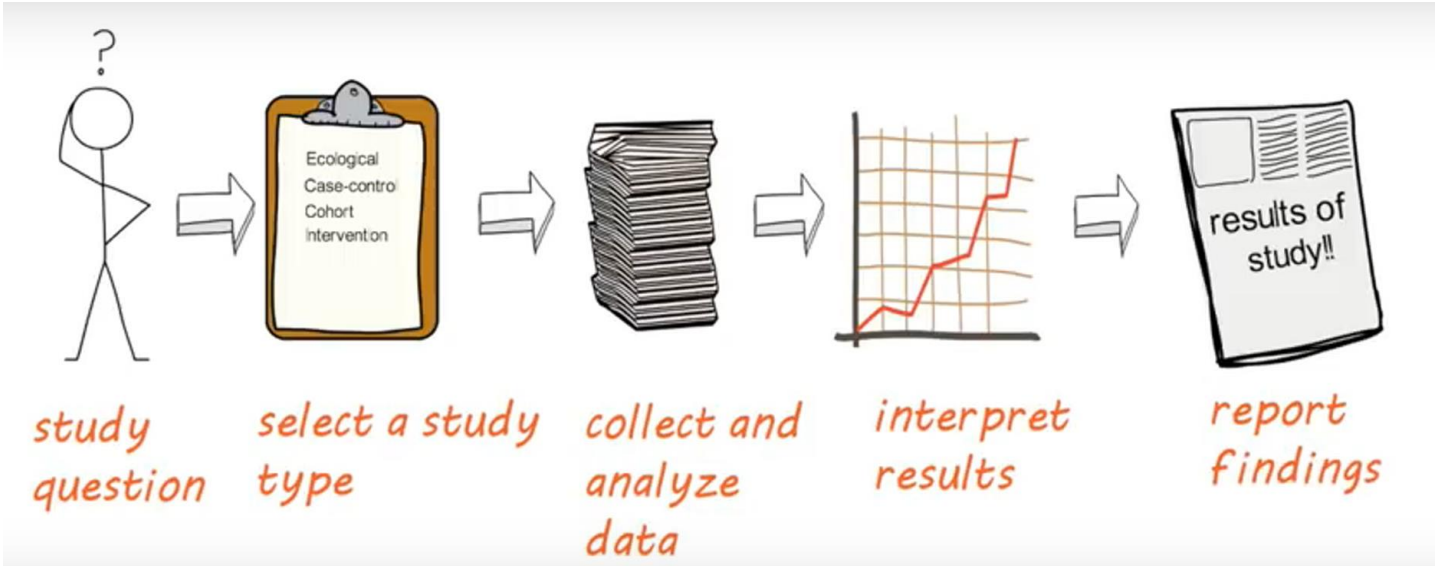
- Part 1: Scientific research for dummies
- Part 2: Interpreting the results of scientific studies and systematic reviews
- Part 3: Cochrane First Aid

Overview

- **Part 1: Scientific research for dummies**
- Part 2: Interpreting the results of scientific studies and systematic reviews
- Part 3: Cochrane First Aid



Scientific research: the process



More information: https://www.youtube.com/watch?v=Jd3gFT0-C4s

Scientific research: defining the study question

Should we have been able to deliver the content of this webinar as an interactive live session in Calgary, would:

- our attendees learn more?
- the level of interaction be higher?
- the overall experience of the attendees be better?

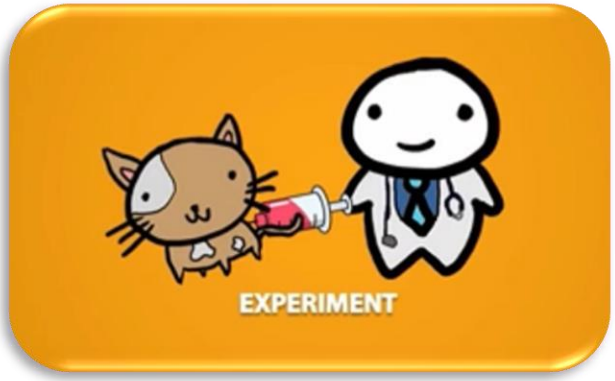
PICO question

Population	Survival 2020 conference attendees
Intervention	Attending webinar
Comparison	Attending interactive live session
Outcome	Learning outcomes, interaction, overall experience

Scientific research: selecting the right study type

More information:
https://blog.optimalworkshop.com/a-beginners-guide-to-qualitative-and-quantitative-research/
https://www.youtube.com/watch?v=a-XtVF7Bofg

Scientific research: selecting the right study type

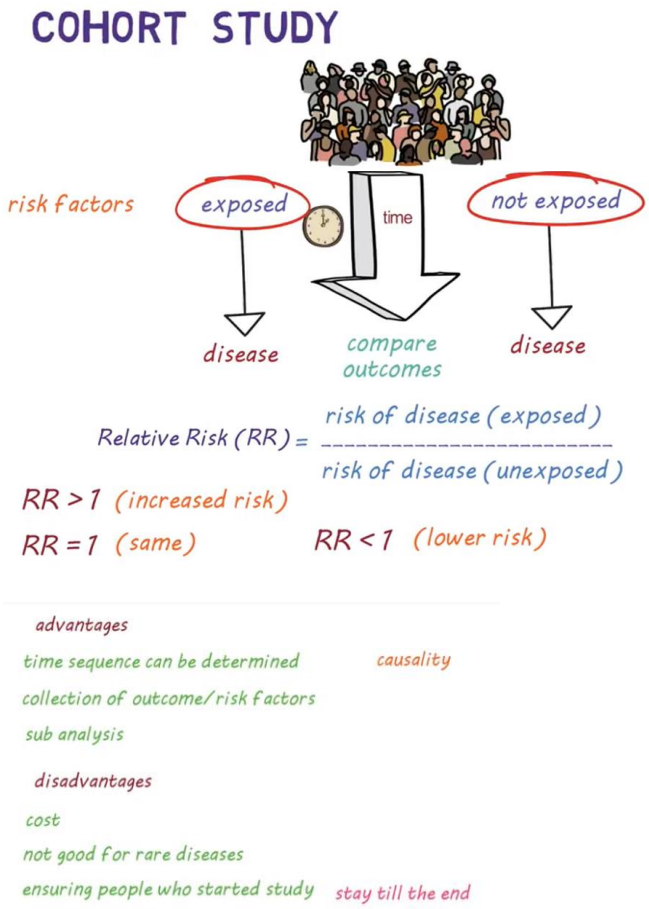


Feature	Experimental study	Observational study
Active intervening?	Yes At least 2 interventions	No
Goal?	Compare the effectiveness of interventions	Investigate if Δ in 1 parameter (e.g. received intervention) cause/are associated with Δ in a 2nd parameter (e.g. mortality)
Demonstrate causality?	Yes	Not necessarily Often only association or correlation

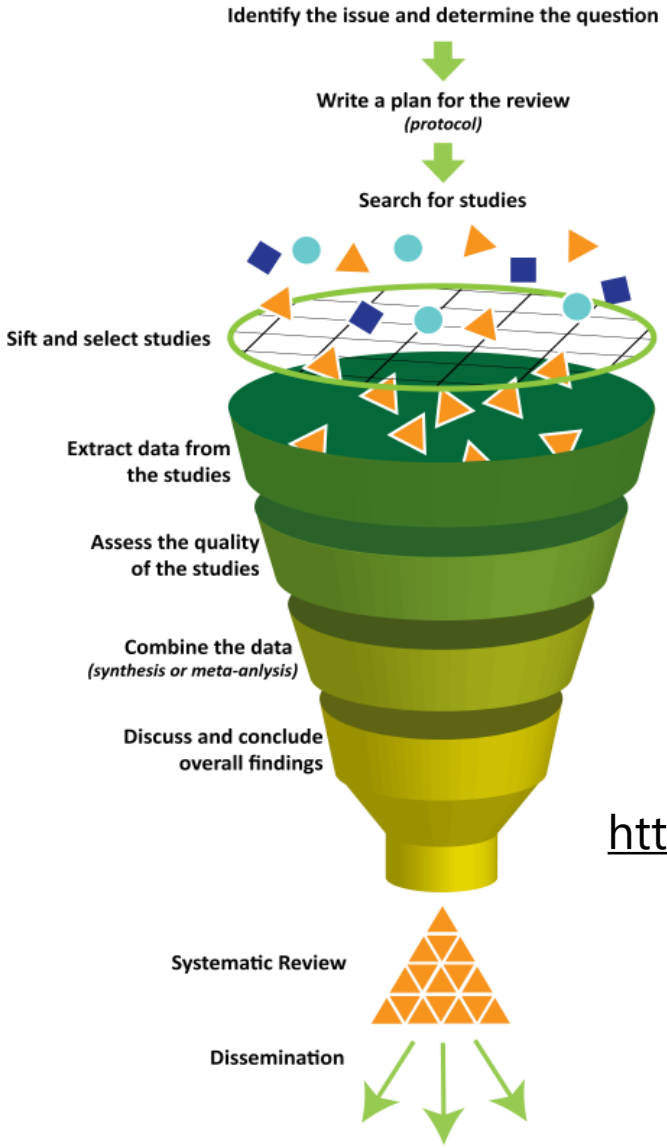
Scientific research: experimental and observational study designs

https://www.youtube.com/watch?v=Jd3gFT0-C4s

Great YouTube movie that covers the most important observational and experimental study designs, including advantages and disadvantages!

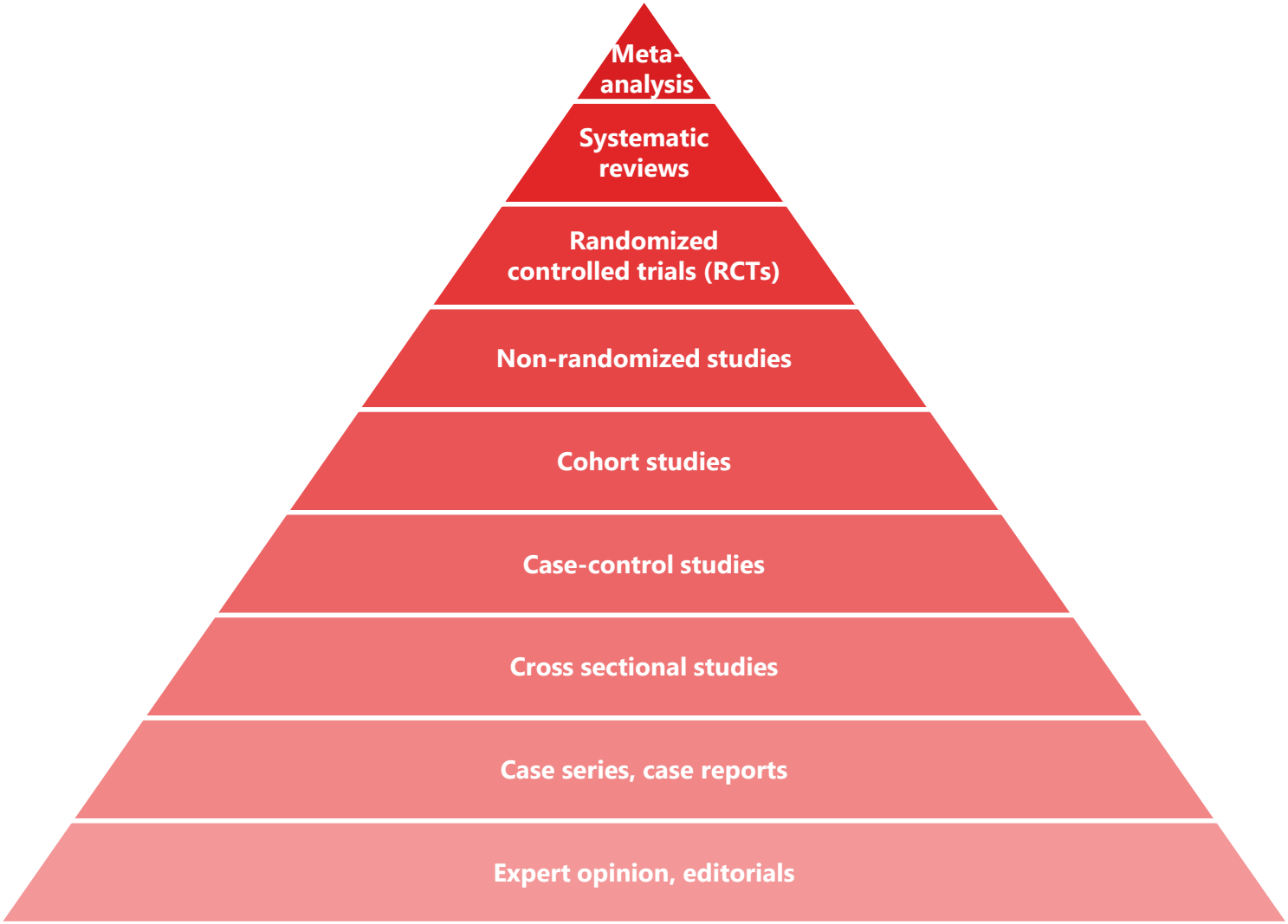


Scientific research: systematic review and meta-analysis



https://www.youtube.com/watch?v=egJlW4vkb1Y

Scientific research: the hierarchy of evidence



Additional useful resources

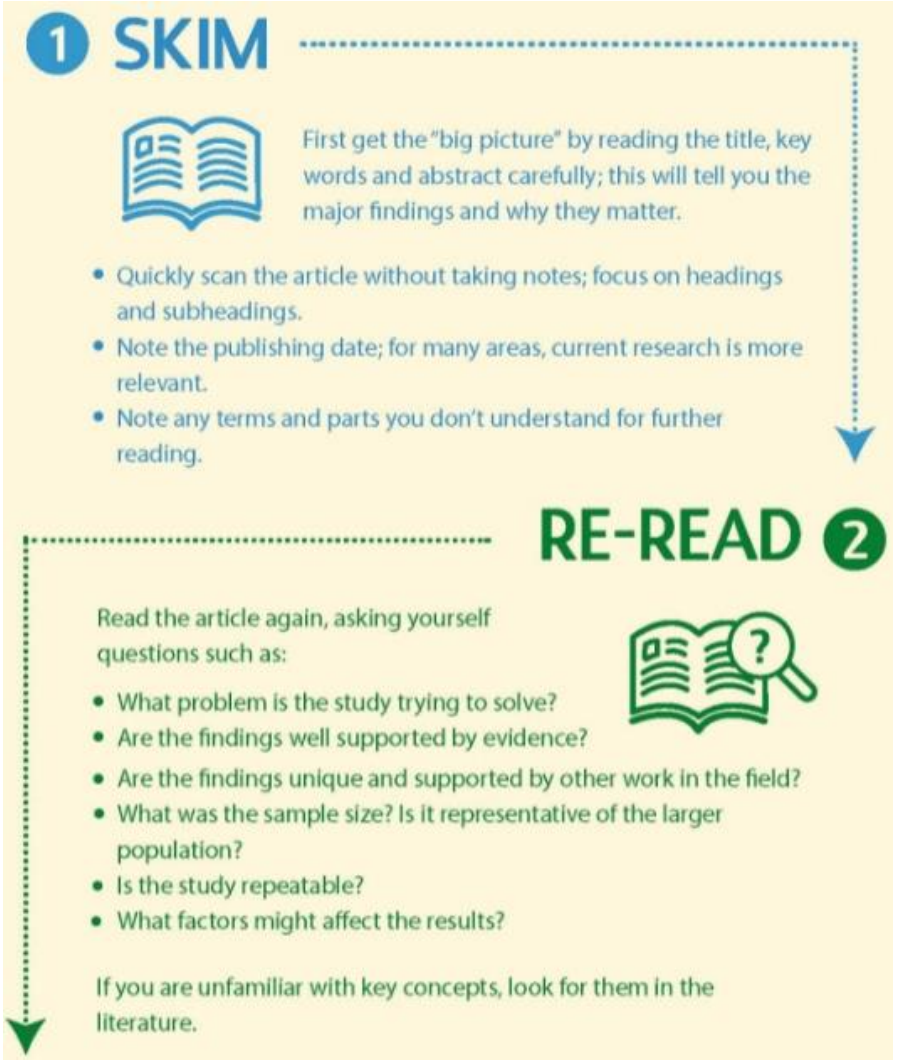
- **Students 4 Best Evidence**
  https://s4be.cochrane.org/
  - > Learning resources, Tutorials and fundamentals
  - > Topics: Study design and research methods, Statistics

- **YouTube channel of Simple Learning Pro**
  https://www.youtube.com/channel/UCiiyrRcEuDSzInajTud90Sw
  - > Types of Experimental designs
  - > Sampling methods
  - > Placebo effect, control groups, and the double blind experiment

Overview

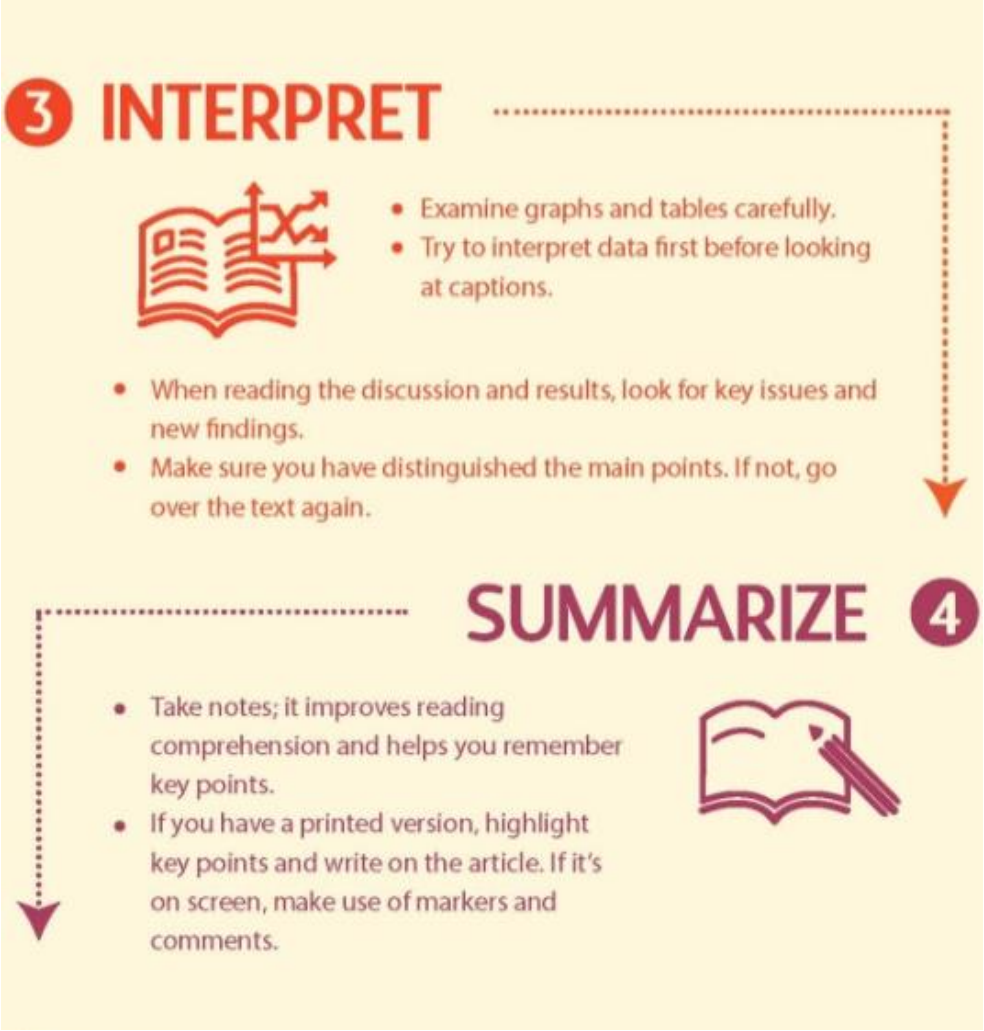
- Part 1: Scientific research for dummies
- **Part 2: Interpreting the results of scientific studies and systematic reviews**
- Part 3: Cochrane First Aid

How to read a scientific paper?



https://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper

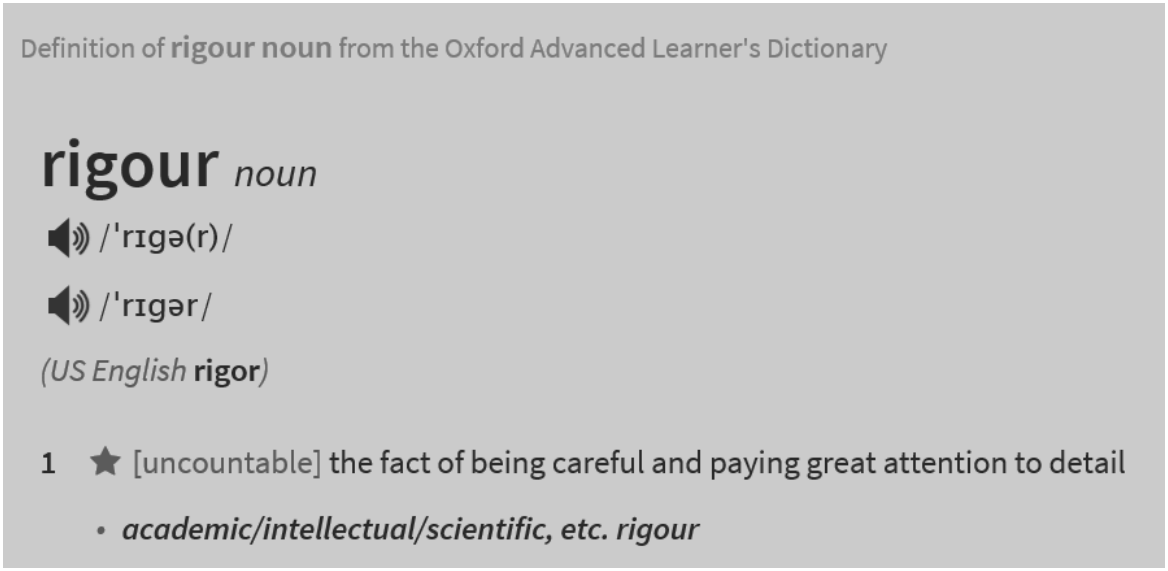
How to read a scientific paper?



https://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper

How to read a systematic review?

- Take a close look at the **Methodology** section
  > How **rigorously** was the review performed?



Replicability and robustness of findings

Rigour of methodology: aspects to consider

- **Protocol registration**
  - > Have they planned the review a priori?
  - > Did they stick to their plan?

- **2 independent reviewers**

- **Literature search**
  - > Did the reviewers search enough and relevant databases?
  - > Is the string of search terms sensitive (inclusive, broad) enough to answer the question? Are we sure they didn't miss studies?
  - > Is there enough information to replicate the search?
  - > Have they included unpublished studies (e.g. evaluation reports, conference abstracts)?

Rigour of methodology: aspects to consider

- **Selection criteria**
  - > Should cover study designs, Population, Intervention, Comparison and Outcomes
  - > Are they clearly described?
  - > Do they make sense? Are rationales provided?
  - > Limits regarding language, time frame?

- **Quality appraisal**
  - > Individual studies: Risk of Bias assessment (tools: RoB 2, ROBINS-I)
  - > Body of evidence: GRADE

- **Data extraction and analysis**
  - > Have they explored the possibility to perform meta-analysis?
  - > If not, have they used alternative manners to synthesize the data?

Rigour of methodology: Cochrane & PRISMA

- **Cochrane MECIR standards**
  - > "Methodological Expectations of Cochrane Intervention Reviews"
  - > Most rigorous method
  - > https://community.cochrane.org/mecir-manual

Cochrane

- **PRISMA checklist**
  - > "Preferred Reporting Items for Systematic Reviews and Meta-analyses"
  - > Minimum set of items for reporting
  - > http://www.prisma-statement.org/

PRISMA

TRANSPARENT REPORTING OF SYSTEMATIC REVIEWS AND META-ANALYSES

Cochrane systematic reviews: fixed format

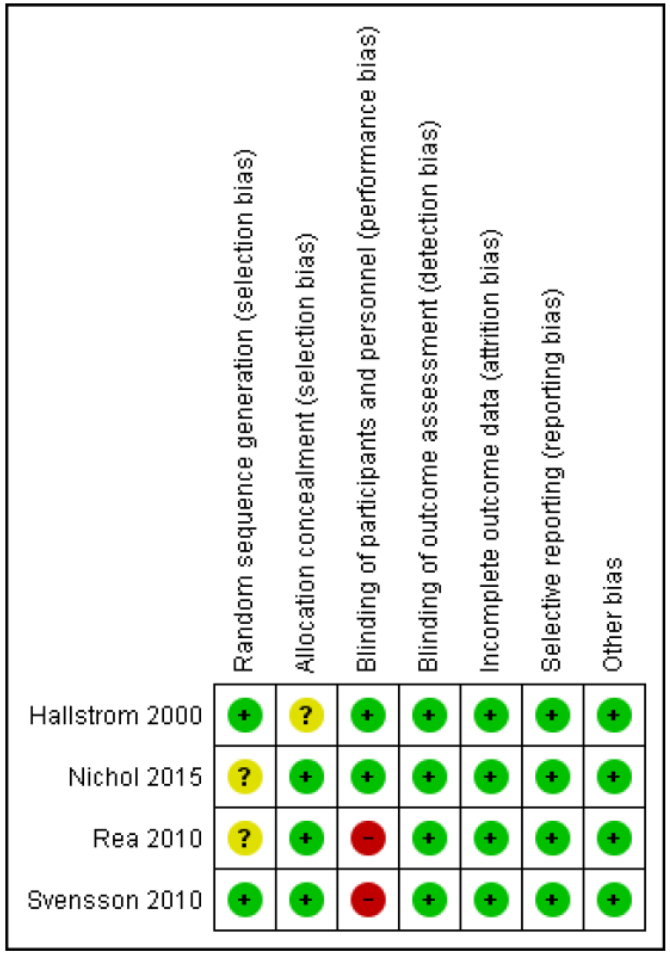
Continuous chest compression versus interrupted chest compression for cardiopulmonary resuscitation of non-asphyxial out-of-hospital cardiac arrest (Review)

Zhan L, Yang LJ, Huang Y, He Q, Liu GJ

- Abstract
- Plain language summary
- Summary of Findings
- Background
- Objectives
- Methods
- Results
- Discussion
- Authors conclusions
- References
- Characteristics of included studies
- Data and analysis
- Additional Tables

Cochrane systematic reviews: Results

- **Risk of bias – Traffic light plot + text**



- Randomization
- Allocation concealed
- Blinding (participants, personnel, outcome assessors)
- Incomplete outcome data
- Selective reporting
- Other bias (e.g. Conflicts of Interest)

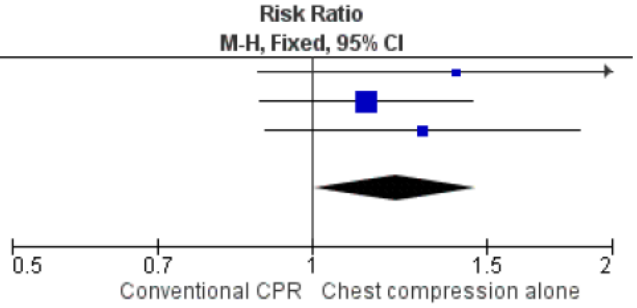
Cochrane systematic reviews: Results

- **Effect of interventions**
  - > Per intervention
  - > Per outcome
  - > Meta-analyses – **Forest plots**

Figure 3. Forest plot of comparison: Bystander-provided CPR , outcome: 1.1 Survival to hospital discharge.

Study or Subgroup	Chest compression alone Events	Total	chest compression + ventilation Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Hallstrom 2000	35	240	29	278	15.3%	1.40 [0.88, 2.22]
Rea 2010	122	978	105	956	60.4%	1.14 [0.89, 1.45]
Svensson 2010	54	282	44	297	24.4%	1.29 [0.90, 1.86]
Total (95% CI)		**1500**		**1531**	**100.0%**	**1.21 [1.01, 1.46]**
Total events	211		178			

Heterogeneity: Chi² = 0.76, df = 2 (P = 0.68); I² = 0%
Test for overall effect: Z = 2.05 (P = 0.04)



Cochrane systematic review: keeping the overview

Cochrane

SUMMARY OF FINDINGS

Summary of findings for the main comparison. Continuous chest compression alone compared to interrupted chest compression plus artificial ventilation for out-of-hospital cardiac arrest

Continuous chest compression alone compared to interrupted chest compression plus artificial ventilation for non asphyxial **out-of-hospital cardiac arrest**

Patient or population: People with non-trauma related out-of-hospital cardiac arrest
Settings: Urban settings in the USA, UK and Sweden (CPR performed by untrained bystanders)
Intervention: Continuous chest compression alone

Comparison: Interrupted chest compression plus ventilation

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Interrupted chest compression plus ventilation	Continuous chest compression alone				
Survival to hospital discharge	**116 per 1000**	**141 per 1000** (117 to 170)	**RR 1.21** (1.01 to 1.46)	3031 (3 studies)	⊕⊕⊕⊕ **High**[1]	
Survival to hospital admission	**341 per 1000**	**402 per 1000** (320 to 504)	**RR 1.18** (0.94 to 1.48)	520 (1 study)	⊕⊕⊕⊖ **Moderate**[2]	
Survival at one year	See comment	See comment	Not estimable	0 (0)	See comment	No data available for this outcome

Cochrane systematic review: keeping the overview

GRADE certainty of evidence	Interpretation	Conclusion statements
High (A)	We have **a lot of confidence** that the true effect is similar to the estimated effect	Continuous chest compressions alone **increases** survival to hospital discharge
Moderate (B)	We believe that the true effect is **probably close** to the estimated effect	Continuous chest compressions alone **probably increases** survival to hospital admission
Low (C)	The true effect **might be markedly different** from the estimated effect	X **may increase/decrease** Y
Very Low (D)	The true effect **is probably markedly different** from the estimated effect	**The evidence is very uncertain** about the effect of X on Y

Cochrane systematic review: keeping the overview

Plain language summary

Available in English | Español | Français | Bahasa Malaysia | Русский

Continuous chest compression versus interrupted chest compression for cardiopulmonary resuscitation (CPR) of non-asphyxial out-of-hospital cardiac arrest (OHCA)

Background

A cardiac arrest is when the heart stops pumping blood around the body. It is a major cause of death worldwide. A large number of cardiac arrests occur outside of hospitals. Conventional CPR includes both chest compressions and rescue breathing such as mouth-to-mouth resuscitation. This is known as interrupted chest compression with pauses at a fixed ratio for rescue breathing (e.g. 2 breaths: 30 compressions) .

Additional useful resources

- **Judging the reliability of research**
  - > https://www.askforevidence.org/help/evidence
  - > http://senseaboutscience.org/wp-content/uploads/2016/11/IDontKnowWhatToBelieve.pdf
  - > http://senseaboutscience.org/wp-content/uploads/2016/09/peer-review-the-nuts-and-bolts.pdf

- **Cochrane Training** - https://training.cochrane.org/
  - > Online learning, learning events (webinars, workshops, courses)
  - > All aspects of systematic reviews and evidence-based medicine

- **Students 4 Best Evidence** - https://s4be.cochrane.org/
  - > Learning resources, Tutorials and fundamentals
  - > Topics: Bias, Searching for evidence, Systematic Reviews

- **Catalog of bias** - https://catalogofbias.org/
  - > Collaborative project mapping all biases that affect health evidence

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Cochrane First Aid

Cochrane First Aid so far

1. **Network building**
   > GFARC as collaborating centre

2. **Building demand**
   > Quarterly screening of Cochrane Library https://www.cochranelibrary.com/
   > Register on first aid-related Cochrane systematic reviews https://firstaid.cochrane.org/evidence

Resuscitation and defibrillation

Author	Year	Title	Cochrane Review Group
Barry	2019	**Community first responders for out-of-hospital cardiac arrest in adults and children**	Cochrane Emergency and Critical Care Group
Bruschettini	2017	**Sustained versus standard inflations during neonatal resuscitation to prevent mortality and improve respiratory outcomes**	Cochrane Neonatal Group
Huang	2014	**Cardiopulmonary resuscitation (CPR) plus delayed defibrillation versus immediate defibrillation for out-of-hospital cardiac arrest**	Cochrane Emergency and Critical Care Group
Lafuente-Lafuente	2013	**Active chest compression-decompression for cardiopulmonary resuscitation**	Cochrane Heart Group
Zhan	2017	**Continuous chest compression versus interrupted chest compression for cardiopulmonary resuscitation of non-asphyxial out-of-hospital cardiac arrest**	Cochrane Emergency and Critical Care Group

Cochrane First Aid so far

3. Knowledge translation

Cochrane First Aid

Continuous chest compressions versus interrupted chest compressions for cardiopulmonary resuscitation of non-asphyxial out-of-hospital cardiac arrest

In adults and children with non-asphyxial cardiac arrest, treated by untrained bystanders, continuous chest compressions improve survival to hospital discharge when compared to standard CPR (high-certainty evidence). They may also improve survival to hospital admission and neurological outcome on hospital discharge, but the effects vary and it is possible that it makes little or no difference (moderate-certainty evidence).

No information is available on adverse events, survival at one year, quality of life or return of spontaneous circulation.

Cochrane review (published 2018); 3 studies with 3737 untrained bystanders, comparing continuous chest compressions (without pauses for rescue breaths) with standard CPR, both with telephone guidance by emergency services.

firstaid.cochrane.org | @cochranefirstaid | https://bit.ly/2MSCDIV

@Cochrane_FA

@CochraneFirstAid

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How to contribute to knowledge translation within Cochrane First Aid?

Product generators

Making blogshots

Product Disseminators

Spreading the work
via social media
(Facebook, Twitter, Instagram)
and other channels
(e.g. own Red Cross Society website)

Translators

Translating blogshots
from English to
another language

cochrane.firstaid@gmail.com

firstaid.cochrane.org

From evidence to guideline: the Belgian Red Cross

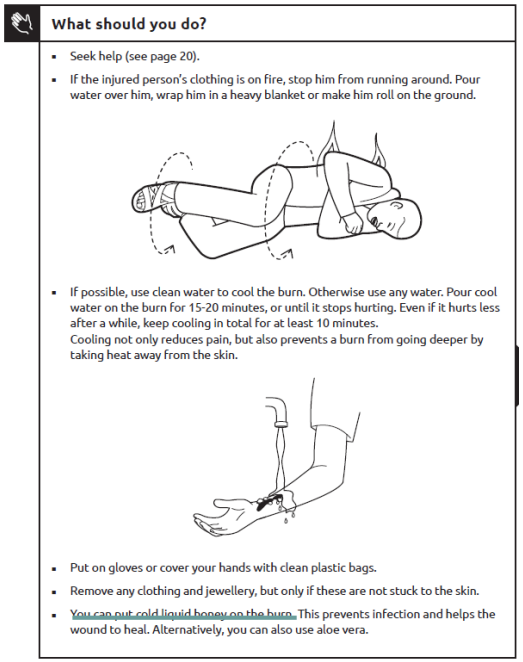
1. Scientific publications

2. Evidence summaries

Broken or dislocated limbs	Management	Sling vs no sling	16-1-2018
Blood pressure	Diagnostics	Automatic blood pressure measurement	16-1-2018
Blood pressure	Management	Blood pressure measurement (laypeople vs professionals)	16-1-2018
Broken or dislocated limbs	Management	Sling vs splint	18-1-2018
Broken or dislocated limbs	Management	Splint vs no immobilisation	18-1-2018
Bruise	Management	Ice	18-1-2018
Burns	Management	Applying mercurochrome	18-1-2018
Burns	Management	Ice	18-1-2018
Burns	Management	Deroofing or aspiration of blisters	18-1-2018
Burns	Management	Honey	18-1-2018

Expert panel
(field experts and
academic experts)

3. **Contextualized** first aid manuals

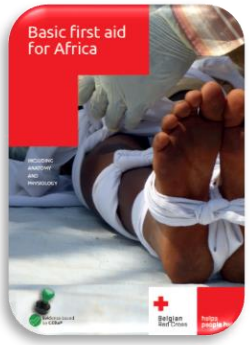


What should you do?

- Seek help (see page 20).
- If the injured person's clothing is on fire, stop him from running around. Pour water over him, wrap him in a heavy blanket or make him roll on the ground.

- If possible, use clean water to cool the burn. Otherwise use any water. Pour cool water on the burn for 15-20 minutes, or until it stops hurting. Even if it hurts less after a while, keep cooling in total for at least 10 minutes.
  Cooling not only reduces pain, but also prevents a burn from going deeper by taking heat away from the skin.

- Put on gloves or cover your hands with clean plastic bags.
- Remove any clothing and jewellery, but only if these are not stuck to the skin.
- You can put cold liquid honey on the burn. This prevents infection and helps the wound to heal. Alternatively, you can also use aloe vera.



There is limited evidence in favour of using honey over conventional dressings:
It was shown that treatment with honey resulted in a statistically significant decrease in time to healing, compared to treatment with conventional dressings.
A statistically significant increase of adverse events, using honey compared to conventional dressings, could not be demonstrated.

Other organisations putting the evidence-based in first aid

- **Scientific Advisory Council (SAC) of the American Red Cross**
  > https://www.redcross.org/take-a-class/scientific-advisory-council

- **International Liaison Committee on Resuscitation (ILCOR)**
  > First Aid Task Force
  > https://www.ilcor.org/ and https://costr.ilcor.org/

- **International Federation of Red Cross and Red Crescent Societies (IFRC)**
  > Global First Aid Reference Centre (GFARC)
  > IFRC First Aid guidelines 2021 in the making
  > https://www.ifrc.org/en/what-we-do/health/first-aid-saves-lives/

Additional useful resources

- **From evidence to guidelines using the principles of Evidence-Based Practice**
  - > https://www.cebap.org/methodology/ebp-e-learning/

Hope to hear from you soon!

Cochrane First Aid

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Belgian Red Cross

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