
	<b>SKILLS CENTER STANDARD OPERATING PROCEDURE</b>	<b>A BIOFIZZ  PRODUCTON</b>
<b>Cochrane Reviews Module Hours: 2</b>	<b>Effective Date: 04/05/2021</b>	<b>Revision # 1.0 A. Siclair Checked: M. Guzie</b>



## BACKGROUND

In an era that revolves around the media, there has been a surge in the spread of misinformation and an increase in debate regarding the relevance and validity of many important scientific topics and the supporting data. It is more important than ever for researchers and medical professionals to make decisions based on high quality information shared in the science community. Organizations, like Cochrane, have been developed as tools to corroborate data findings, analyze the statistical significance of data, and broadly interpret which findings are valuable for the scientific community.

Cochrane is a non-profit organization dedicated to providing evidence and analyzing data from various research areas in healthcare (Cochrane, n.d.). The goal of the organization is to ensure that healthcare and science professionals are provided with reliable, high quality data to inform their decisions and research. Some of the main contributions from the organization that help to achieve this goal are the Cochrane Reviews. These systematic reviews compile and analyze all of the data and results from research on a particular topic (Cochrane, 2016). The intension is to approach the research from a “standardized, transparent and objective view” which allows for a more unbiased assessment of the significance (Cochrane 2016).

The Cochrane organization is one of the strongest resources to analyze the weight data holds in the scientific community. It is an accessible resource on an international scale, having been converted into 14 languages, and emphasizes the importance of a global research network.



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## 1. PURPOSE

The purpose of this procedure is to become comfortable with navigating the Cochrane Review website and to understand how the tool can be used to analyze the quality and reputability of data.

## 2. SCOPE

This procedure applies to qualified skills center users.

## 3. RESPONSIBILITY



- 3.1. It is the responsibility of the user to understand and perform the procedure described in this document.
- 3.2. It is the responsibility of the user performing the procedure to fully document any deviations from the written procedure.
- 3.3. It is the responsibility of the user to become trained on the procedure.

## 4. DEFINITIONS

- 4.1. Cochrane – a non-profit organization that focuses on providing an objective and standardized evaluation of the data and results surrounding specific research topics.
- 4.2. Intervention – a drug or medical approach to treatment that is being studied.
- 4.3. Forest plot – a graphical representation comparing several clinical or scientific studies that focus on the same topic, with a focus on the statistical significance and potential benefits of the results.
  - Cochrane included a forest plot in their organization’s symbol.
- 4.4. Line of no effect – the vertical line in the center of the forest plot.
- 4.5. Point estimate – a single value given as an estimate of a parameter of a population.

## 5. MATERIALS/EQUIPMENT

- 5.1. Cochrane website: <https://www.cochranelibrary.com/>

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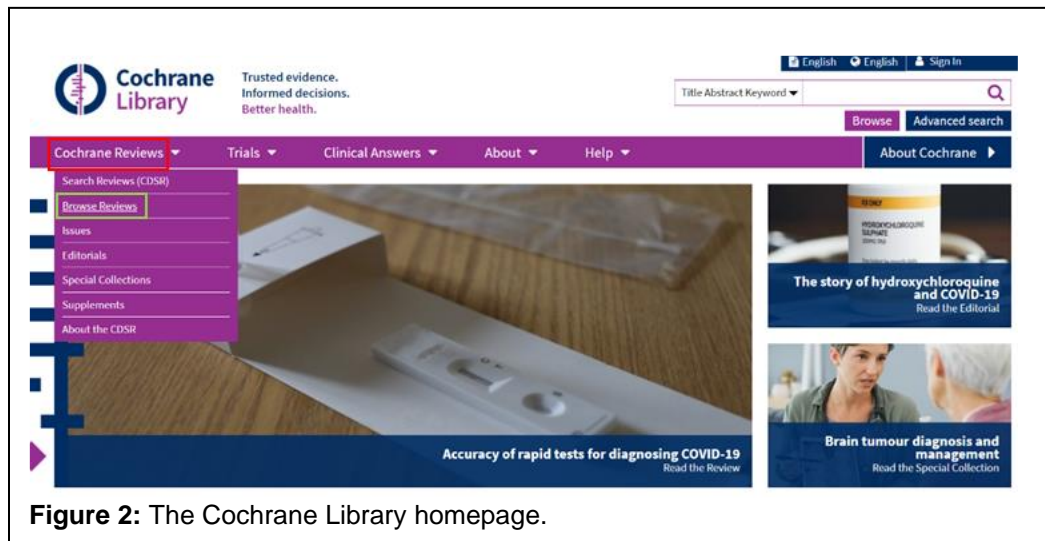
## 6. PROCEDURE

### 6.1. Navigating the Cochrane Reviews

6.1.1. Go to the Cochrane site: <https://www.cochranelibrary.com/>

6.1.2. Hover over the **Cochrane Reviews** tab and click **Browse Reviews**. (Figure 2)



- This will bring you to a page housing all of the different review categories. Choose one of your interest (Genetic Disorders was the category used for this example).



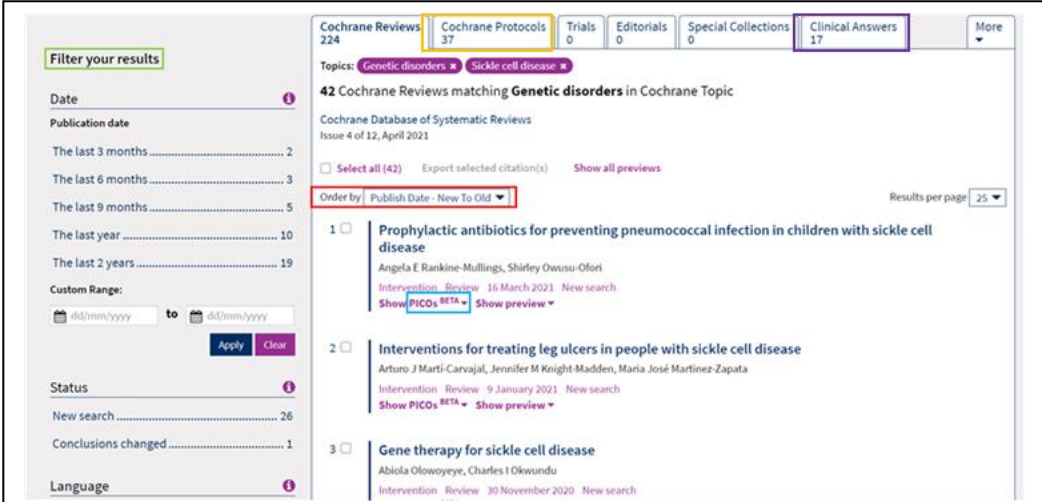
**Figure 2:** The Cochrane Library homepage.

6.1.3. After selecting a topic of interest, a new window will open with multiple different reviews listed. (Figure 3)

- The **left column** allows for further filtering of the information using features like topic type and publication date. The example filtered the results to reviews strictly focused on sickle cell disease.
- The reviews are **listed** from the most recent to the oldest reviews automatically, but this can be changed to listing by title among other options.
- Clicking on the **PICOs<sup>BETA</sup>** tab allows for a quick preview of the different components of the study that was reviewed: population, intervention, comparison and outcome. This can give you a quick summary to see if this review fits your needs or interests.



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- The **Cochran Protocol** section describes the different protocols that have been taken to formulate the given systematic reviews. They sometimes contain topic summaries and provide references for the information. (Whitman, 2020)
- The **Clinical Answers** section is intended to provide quick answers about health topics to providers. (Whitman, 2020)

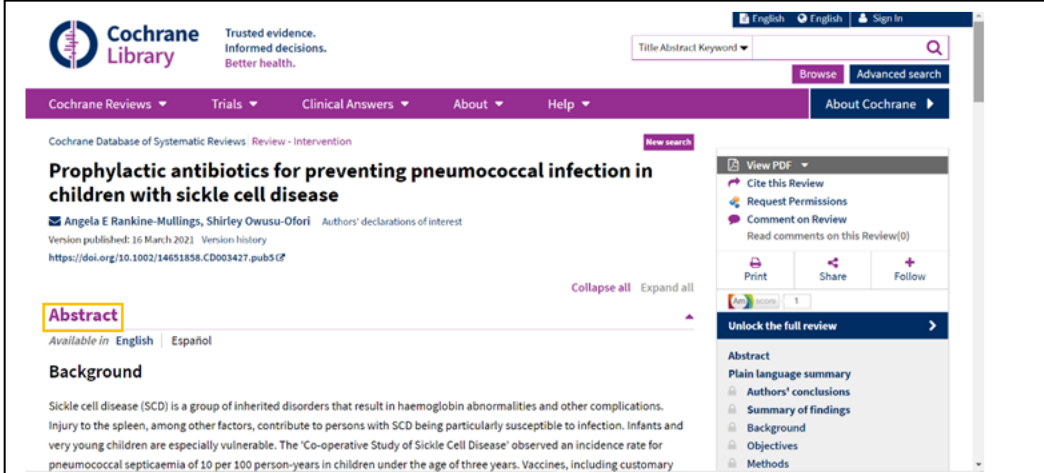


**Figure 3:** The selection of reviews listed under the genetic disorder category that is filtered for sickle cell diseases.

- 6.1.4. Click on one of the reviews. For this example, the “Prophylactic antibodies for preventing pneumococcal infection in children with sickle cell disease” review was used. (Figure 3)
- Important note: each systematic review is overseen by a Cochrane editorial team. (Whitman, 2020)
- 6.1.5. A new window will open with summary information about the included studies and the systematic review itself. (Figure 4)
- The abstract section gives some information on the background of the disease or condition, the methods involved in the administration of the

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intervention and other basics needed to give a brief overview of the studies included in the systematic review.



The screenshot shows the Cochrane Library interface. The title of the review is "Prophylactic antibiotics for preventing pneumococcal infection in children with sickle cell disease". The authors listed are Angela E Rankine-Mullings and Shirley Owusu-Ofori. The version published is 16 March 2021. The abstract section is highlighted, and the "Background" section is visible, starting with "Sickle cell disease (SCD) is a group of inherited disorders that result in haemoglobin abnormalities and other complications. Injury to the spleen, among other factors, contribute to persons with SCD being particularly susceptible to infection. Infants and very young children are especially vulnerable. The 'Co-operative Study of Sickle Cell Disease' observed an incidence rate for pneumococcal septicaemia of 10 per 100 person-years in children under the age of three years. Vaccines, including customary

**Figure 4:** The abstract summary information of a systematic review involving sickle cell disease.



- One of the most important parts of this page is the main results section. This section usually describes how many trials are pooled into the systematic review while also giving a brief results summary. As seen in the first sentence of the example section, 3 studies were used in this specific systematic review analysis. (Figure 5)

**Main results**

Six trials were identified by the searches, of which three trials were eligible for inclusion. A total of 880 children, who were between three months to five years of age at randomization were included. The included studies were conducted in centres in the USA and in Kingston, Jamaica. In trials that investigated initiation of penicillin on risk of pneumococcal infection, the odds ratio was 0.37 (95% confidence interval 0.16 to 0.86) (two trials, 457 children) (low-certainty evidence), while for withdrawal the odds ratio was 0.49 (95% confidence interval 0.09 to 2.71) (one trial, 400 children) (low-certainty evidence). Adverse drug effects were rare and minor. Rates of pneumococcal infection were found to be relatively low in children over the age of five years.

Overall, the certainty of the evidence for all outcomes was judged to be low. The results from the risk of bias assessment undertaken identified two domains in which the risk of bias was considered to be high, these were incomplete outcome data (attrition bias) (two trials) and allocation concealment (selection bias) (one trial). Domains considered to have a low risk of bias for all three trials were selective reporting (reporting bias) and blinding (performance and detection bias).

**Figure 5:** The main results section for the example review, which describes that 3 trials were deemed eligible for inclusion in the systematic review.

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- The plain language summary section gives more information that is focused on the systematic review rather than the trials themselves. This includes information like the background of the review, the number of studies and subjects included by pooling the trials and the results and conclusions of the review based on the given evidence. This feature can be extremely beneficial when determining if this research is worthwhile since the full-length Cochrane reviews can get quite lengthy. (Figure 6)

**Plain language summary** ▲

Available in [English](#) | [Español](#)

**Regular antibiotics for preventing pneumococcal infection in young children with sickle cell disease**

**Review question**

We reviewed the evidence about the effects of prophylactic antibiotic regimens for preventing pneumococcal infection in children with sickle cell disease (SCD). This is an updated version of a previously published Cochrane Review.



**Background**

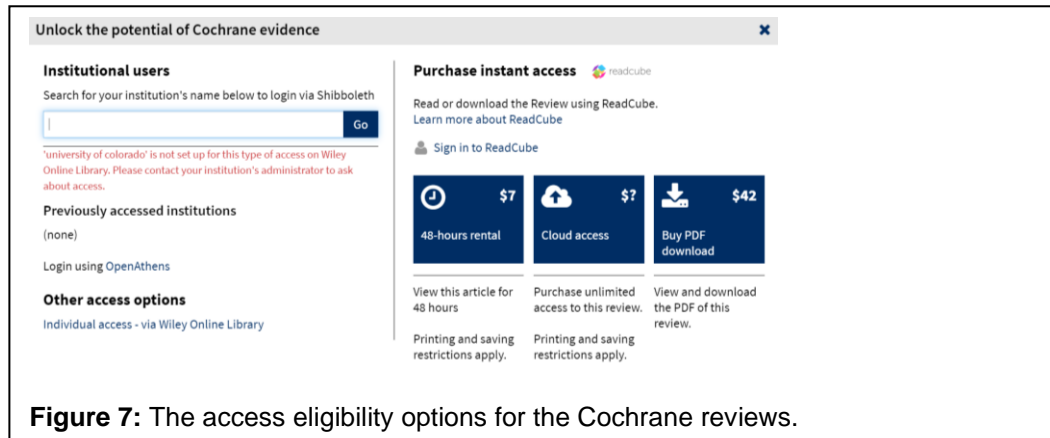
People living with SCD are especially prone to respiratory and blood infections. These infections are often caused by a germ (bacteria) known as *Streptococcus pneumoniae*, otherwise known as pneumococcus, which can cause many types of serious illnesses. Individuals with SCD can acquire infections more easily than unaffected persons because their spleen (an organ in the body that filters blood and is vital for the proper functioning of the immune system) does not work correctly, and also because damaged tissue and bone resulting from SCD can harbour bacteria. Infection prevention is therefore one of the major ways to improve the health of persons living with SCD and reduce the risk of death. The highest risk of infection occurs in children under three years of age, but the special vaccines that help to prevent illnesses with *S pneumoniae* are of limited use in this young population. Therefore, regular antibiotics in addition to these special vaccines are needed to prevent infection. As risk of infection decreases with age, there might be a time when preventative antibiotic treatment can be discontinued. The aim of the review was to determine the effects of antibiotic prophylaxis against pneumococcus in children with SCD.

**Figure 6:** The plain language summary for the example sickle cell disease systematic review.

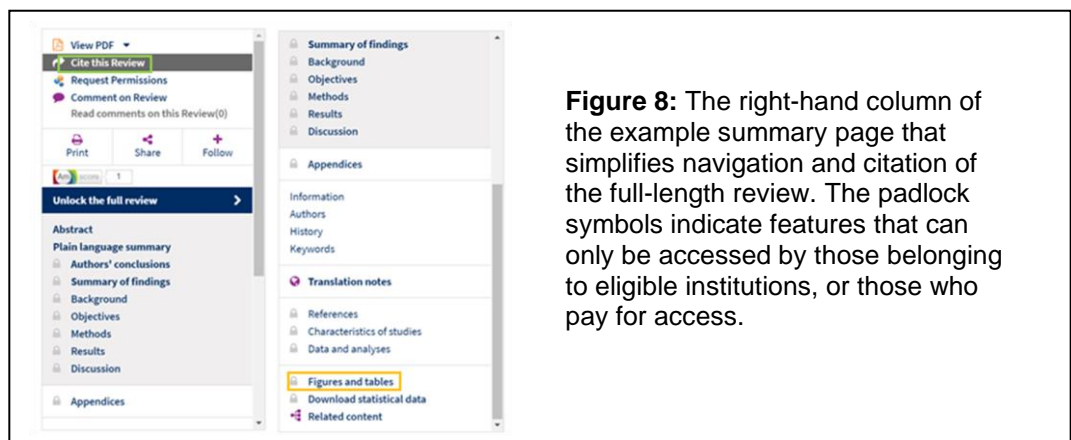
6.1.6. Clicking the “Unlock the full review” button at the bottom of the page will bring you to the full-length document, which can contain up to hundreds of pages. This will bring up multiple options to either sign in by institution or to pay for access. (Figure 7)



- Unfortunately, Cochrane requires payment or membership to specific institutions to access the full reviews instead of just summaries. Keep this in mind for further steps; the images will not be indicative of what would appear with full access.

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- 6.1.7. If you do gain access to the full reviews, there are other features from the summary page that can be beneficial, mainly found in the right-hand column of the page. (Figure 8)
- The **Cite this Review** section formulates a citation of the review automatically for you, which is great when referencing the review to inform your own research.
  - The **Figures and tables** section takes you directly to these components of the systematic review which can be helpful in the lengthy documents to find quick evidence and analysis.

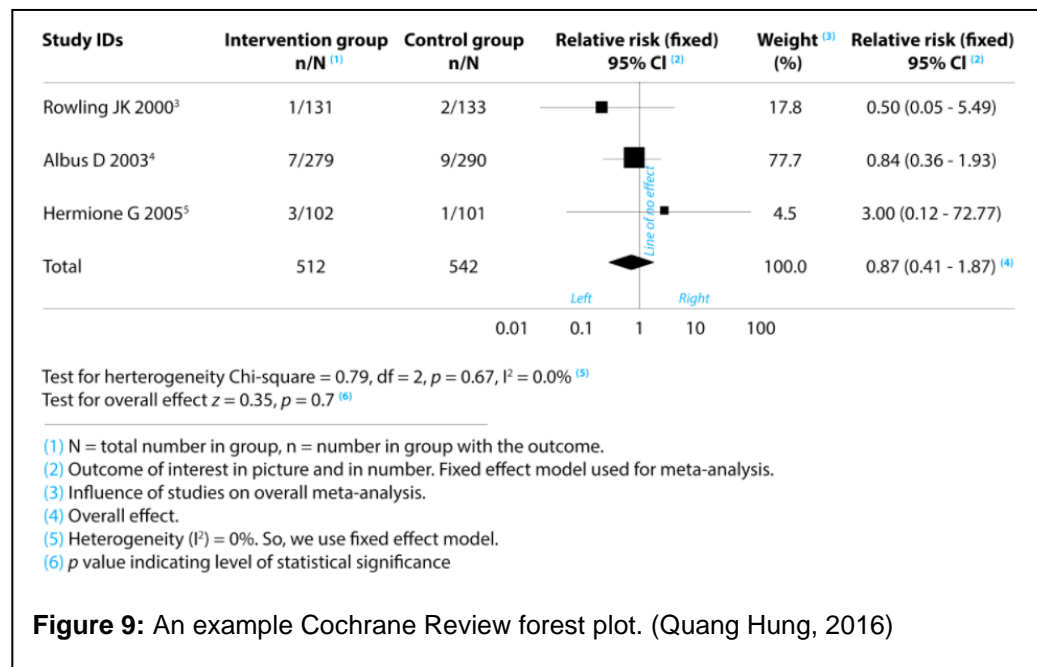


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## 6.2. Reading a Forest Plot

6.2.1. Forest plots are used in the full-length systematic reviews to give a simple visual summary of the review results.

- Since the full-length review cannot be accessed without an eligible institution or payment, the provided example forest plot is not from the previous example review. (Figure 9)





6.2.2. Anything to the right of the line of no effect favors the control, while anything to the left of the line favors the experimental intervention (Figure 9)

6.2.3. Each horizontal line represents an individual study. (Figure 9)

- The shorter the line, the stronger the study – the line represents the confidence interval.
- If the horizontal line crosses the line of no effect, then a statistically significant result is not demonstrated since the null value is potentially the true value. (Cantley, 2016)

6.2.4. The black box on each horizontal line represents the point estimate of each singular study, and the size of the square correlates with the number of



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participants in the study – a larger square means more participants. (Figure 9) (Cantley, 2016)

6.2.5. The diamond represents the statistical average of all the combined studies. (Figure 9) (Whitman, 2020)

- If it falls to the left of the line of no effect, this means that the intervention or therapy was found to be beneficial.
- If it falls to the right side of the line of no effect, this means that the intervention or therapy was found to be harmful.
- If it touches the line of no effect, this means that there is no significant difference between the experimental and control groups, since the null value could be the true value.

## 7. REFERENCES

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## 8. MODULE MASTERY TASK

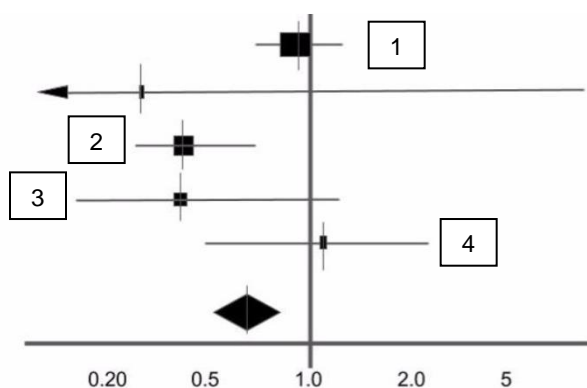
This task will test your abilities to navigate the Cochrane Reviews and to analyze a forest plot for statistical significance surrounding a therapeutic intervention.

1. Browse the Cochrane Review topics and pick both a broad and narrowed category (EX: Genetic disorders and sickle cell disease). Which topics did you choose?

**For the following section, choose 1 review to focus on.**

2. Describe the disease or condition of interest, including the cause if it is known.
3. What were the objectives of the study/studies that were reviewed?
4. How many trials or studies were pooled to be analyzed in the systematic review?
5. How many participants were included in the systematic review?
6. What was the broad conclusion of the review regarding the studies of interest? (This can be done using just the summary page if full-length access is not possible)

**For the following section, use the image below. (Cantley, 2016)**



7. Which study/studies would be considered statistically significant? Why?
8. Which study had the largest number of participants?
9. Which study/studies favored the experimental intervention?
10. What can be concluded from the diamond location?