

# Level of Understanding and Areas of Application of Cochrane Reviews among Practicing Physicians Affiliated with the Philippine General Hospital

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## ABSTRACT

**Objective.** The main objective of this study is to determine the level of understanding, accessibility and areas of application of Cochrane reviews (CR) among medical practitioners affiliated with a tertiary care medical center in Metro Manila, Philippines.

**Study Design.** Survey using a self-administered questionnaire was conducted.

**Target Population and Setting.** Consultant doctors of the Philippine General Hospital (PGH) were invited to participate. The PGH is the national university hospital of the Philippines and is a tertiary referral center and teaching hospital of the University of the Philippines Manila.

**Sampling Scheme.** 101 doctors were chosen by stratified random sampling with the clinical department as the stratification variable. Strata samples were targeted according to strata size (proportional to size).

**Measurement Instrument.** Eight domains that are important in the understanding of the CR were included in a 25-item multiple-choice questionnaire. In addition, facilitating factors and barriers to the application of CR or systematic reviews (SR) were asked.

**Data Analysis.** Using a 25-point Multiple Choice Questionnaire, the knowledge of the respondents was measured and the mean score was estimated at a 95% confidence level. The percentage of CR awareness was also estimated at 95% confidence level. Facilitating factors and barriers in the use of SR were described. In addition, the following post-hoc analyses were done: descriptions of the total score according to gender, age, year graduated and year of last training.

**Results.** Of 101 consultants invited, 59 participated (58% response rate) within the 6-month data collection period. The mean age was 47.2 years with a standard deviation (SD) of 7.8

years. Forty-five respondents (76%) had their last formal medical-related training from 1991 onwards. The mean score was 14.7 points (SD 6.7) using the 25-item multiple choice questions on concepts and principles of systematic reviews. Of these 59 respondents, 49 (83.0%; 95% CI: 75.2 – 90.9) indicated that they were aware of the existence of CR. Of those who were aware of CR, 42 (85.7%, 95% CI: 75.9 -95.6) have actually used them. The following factors help the respondents use CR: efficient Internet access, working knowledge of research methodology, working knowledge of how to critically appraise the medical literature, and familiarity with the terms used in the review. On the other hand, the following were considered barriers: inefficient access, poor knowledge of general research methodology, poor understanding of the principles of Evidence-based medicine (EBM) and difficulty in understanding the reviews.

**Conclusion.** Practicing physicians in a tertiary university hospital in the Philippines were only able to get about 60% of the principles and concepts of understanding SR. Eighty three percent of them are aware of CR. Access to internet, familiarity with terms and working knowledge of CR and evidence-based medicine are the facilitating factors for application of the results of SR and CR. Although most claimed to use the SR results in literature reviews, only about 60% are able to use them in teaching, clinical practice or health policy development.

**Key Words:** *cochrane reviews, systematic reviews, meta-analysis, knowledge, evidence-based medicine*

## Introduction

Evidence-based Medicine (EBM) has aroused significant interest since its inception in 1991.<sup>1</sup> It proposed a paradigm shift in both the practice of medicine and how to teach it. There is growing recognition that evidence-based medicine (EBM) in general practice will improve health outcomes for patients. EBM has introduced new concepts and has also triggered a diversity of educational initiatives for critical appraisal of the literature.

One such initiative is the Cochrane Collaboration. The Cochrane Collaboration is an international organization that has revolutionized the synthesis (systematic review) of evidence. It aims to help people make well-informed decisions about health care by preparing, maintaining, and ensuring the accessibility of rigorous, systematic, and up-to-date reviews (and, where possible, meta-analyses) of the

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benefits and risks of health care interventions.<sup>2</sup> In addition, the collaboration also promotes timely dissemination of these syntheses. It is envisioned that this timely dissemination can influence clinical practice thereby promoting optimum and equitable health care delivery.<sup>3,4,5</sup> Given the highly technical nature of the reviews, educational materials have been developed and literature have been published to promote better understanding of such reviews.<sup>6,7,8,9</sup>

In spite of efforts of Cochrane to provide up-to-date reviews, there exists a significant disparity between science and evidence versus actual clinical practice.

Past surveys on different health professionals (including general practitioners, urologists and postgraduate specialist trainees) indicated that 1) awareness of the Cochrane Collaboration was seen in only 15-40% of respondents; 2) 15-50% claimed they had a good grasp of EBM terms; 3) barriers to the use of Cochrane reviews included lack of personal time, skill, expertise and internet access as well as demand for treatment despite lack of evidence for effectiveness.<sup>10,11,12,13</sup> Some of the strategies to overcome these barriers and to enable greater utilization of systematic reviews like easy reading presentation formats and explanatory messages as well as brief reports in easy-to-understand styles were sent by email directly to the end-users.

Cochrane Reviews and related tools are accessible online to majority of practicing physicians in major cities in the Philippines. However, the usage and understanding of these reviews among Filipino medical practitioners have not been formally studied. Are the reviews reaching their target end-users, namely the practicing physicians? Furthermore, among those who have access to the reviews, are the reviews understandable to a level that ensures appropriate application of the synthesized evidence?

It is therefore the main objective of this study to determine the level of understanding, accessibility and areas of application of Cochrane Reviews (CR) among medical practitioners affiliated with a tertiary care medical center in Manila. Specifically, the study aims to determine the percentage of practicing physicians who are aware of the existence of CR; the level of understanding of the key concepts of a Systematic Review (SR) among these physicians; areas of application where CR have been used; and the enabling factors and barriers in the application of CR.

The need to put 'what works' into practice is particularly important in resource-poor countries.<sup>14</sup> Ineffective treatments can exhaust limited resources leading to further health inequity. Understanding the barriers to reducing this evidence-practice gap in a developing country setting can lead to optimal practice and eventually to better care. The results of this study will be able to identify strategies to hone the skills of medical practitioners in using

synthesized evidence such as CR or systematic reviews in general.

## Methods

### Study Design

Survey using a self-administered questionnaire was conducted.

### Target Population and Setting

Philippine General Hospital is the national university hospital of the Philippines. It is a tertiary referral center and teaching hospital of the University of the Philippines Manila. It has 15 clinical departments with more than 600 consultant doctors, 1500 patient beds (1000 charity, 500 pay and special units); and it includes modernized and upgraded service, training and research facilities (<http://www.pgh.gov.ph/>).

### Sampling Scheme

A stratified random sampling with the clinical department as the stratification variable was employed and strata samples were targeted according to size (proportional to size).

From the complete list of consultants (which served as the sampling frame) in each of the 15 clinical departments of the hospital (cancer institute, out-patient services, pay patient services and hospital dentistry were excluded), a simple random sample of consultants were selected per department. A consultant was defined as a medical doctor who is actively practicing and is Board-certified in any of the following specialties: Pediatrics, Otorhinolaryngology, Internal Medicine, Ophthalmology, Orthopedics, Surgery, Obstetrics and Gynecology, Family and Community Medicine, Psychiatry, Rehabilitation Medicine, Radiology, Anesthesiology, Laboratory and Neuro-Science. Retired or resigned consultants were excluded. Selected consultants were invited to participate in the study. The rationale for their participation (answering a self-administered questionnaire) and how the results will be used were explained to the consultants in the cover letter of the questionnaire. The cover letter also specified contact details of the investigators in case the consultants had any questions regarding the study.

### Sample Size

Given a finite population of 600 consultants, 101 consultants were required to estimate the percentage of physicians who are aware of the existence of Cochrane Reviews at 95% confidence level, assuming a percentage of 50%, margin of error set at 10%, and non-response rate assumed to be 20%. This sample size was also sufficient to estimate the level of knowledge [mean score] of the consultants regarding key concepts of CR at 95% confidence level, assuming a standard deviation of 20 points, setting the

margin of error at 5 points and assuming 20% non-response rate.

### Questionnaire Development

Three (3) clinical epidemiologists and 1 biostatistician identified important areas of knowledge about systematic reviews and these were considered the domains of the questionnaire. These included: 1-directness of the Systematic Review question to the real clinical question, 2-literature review, 3-validity of individual studies, 4-interpretation of measures of effect/association, 5-basic statistical inference concepts, 6-forest and funnel plots, 7- biases and 8-subgroup, post-hoc and sensitivity analyses. The group devised Multiple Choice Questions (MCQs) with 4 choices each for these domains. Each MCQ equaled 1 point. A consultant could get a maximum of 25 points. In addition to the MCQs, the form also asked general information about the consultant, facilitating factors and barriers to the application of Cochrane reviews or systematic reviews in general. The draft questionnaire was presented to colleagues for review and was shortened and simplified. The revised questionnaire was then pre-tested to clinicians with similar characteristics as the target population and their comments and suggestions were used to write the final questionnaire (Appendix).

### Data Collection, Encoding and Processing

Using the questionnaire, a field assistant under the supervision of the research associate approached randomly selected consultants in each department to invite them to participate in the study. The questionnaire had a cover letter explaining the nature and objectives of the study. It also informed prospective study participants that all data collected would be considered CONFIDENTIAL by the research team. The same field assistant collected the filled-out questionnaires and forwarded the same to the research associate.

In cases where the field assistant and the research associate were unable to retrieve the questionnaires in spite of repeated follow ups, the team of investigators themselves did the follow up.

Double data entry was done by a trained data encoder in Excel databases with structures specially designed for the study. The two databases were validated against each other and detected inconsistencies were corrected based on the data in the questionnaire. In addition, range checks and consistency checks were done. Out-of-range entries and inconsistent data were likewise checked against the Questionnaire. As soon as all errors were validated, the database was locked for analysis.

Confidentiality was ensured for all the data collected. A small token (chocolate candy) was given after submission of the survey form. The University of the Philippines National Institute of Health Ethics Review Board was consulted about

exemption from a full research ethical review. Since the intent of the survey was just to measure the medical practitioners' knowledge that may be reflective of practice and lead to professional development, the study was considered of low-risk for ethical violation.

### Data Analysis

Demographic characteristics of the respondents were described. Age of the consultant was counted as of his last birthday. Years since completion of training of the respondent was based on the number of years since graduation from medical school or from number of years since completion of residency or fellowship. The percentage of awareness of Cochrane Reviews was estimated at 95% confidence level. Among those who were aware, the percentage of respondents who used these reviews was also estimated at 95% confidence level. Using a 25-point MCQ, the knowledge of the respondents was measured and the mean score was also estimated at 95% confidence level. All estimates were generated using 'department' as the stratification variable with finite population correction.

In the MCQ for knowledge of CR, no answers (or blanks) were considered incorrect answers under the assumption that no response suggests uncertainty or no knowledge of the concept.

The areas and frequency of application of CRs were described. Facilitating factors and barriers in the use of systematic reviews were also described. In addition, the following post-hoc analyses were done: descriptions of the total score according to gender, age, year graduated and year of last training.

All analyses were performed using Stata v. 10.

### Results

Of the 101 forms distributed, 59 were retrieved within the 6-month data collection period (response rate 58%). There were 3 outright refusals while 39 failed to submit the questionnaire despite several follow-ups. Of the 59 respondents who participated, eight (8) had incomplete answers to the questionnaires. Seven of these 8 respondents graduated from their medical school between 1970-1987.

### General Information

There were 29 males (49%) and 30 females (51%). The mean age was 47.2 years with a standard deviation (SD) of 7.8 years. The youngest was 30 years and the oldest was 73 years.

The earliest year of graduation from medical school reported was 1961 while the latest was 2005. Eleven respondents (19%) graduated from medical school earlier than 1980, 25 respondents (42%) between 1981-1990, 21 respondents (36%) between 1991-2000, and only 2 beyond 2001.

Forty-five respondents (76%) had their last formal training from 1991 onwards. One respondent had his/her last formal training in 1967, while the latest (last) training was reported to be in 2009.

**Awareness of Cochrane Reviews**

Of the 59 respondents, 49 (83.0%; 95% CI: 75.2 – 90.9) indicated that they were aware of the existence of Cochrane Reviews (CR). More than 50% of them learned about CR from their colleagues, residency or fellowship training or/and from scientific conventions. 47% reported having learned about CR from the medical literature. One or two respondents learned about CR during their undergraduate medical education, EBM workshops or from the MS clinical epidemiology course.

Of the 49 who were aware of CR, 42 (85.7%, 95% CI: 75.9 -95.6) have used these reviews. CR was used by the respondents most commonly in their review of literature as seen in Table 1.

**Table 1.** Areas of Application of CR of 42 respondents

Answers	Number (%)
Review of Literature	39 (92.9)
Research	27 (64.3)
Clinical Practice	25 (59.5)
Teaching	24 (57.1)
Practice Guidelines/Policy Development	21 (50.0)

*Note: Multiple answers were allowed*

**Understanding of Systematic Reviews (SRs) or Meta-Analyses** measured by a 25-item multiple choice questionnaire on concepts and principles of systematic reviews

The mean score was 14.7 points (SD 6.7). The lowest score was 0 and highest score was 23 points. Median was a score of 16.

Only 20% of the 59 respondents got the correct answer for the question on general concept of SR. The question with the highest number of respondents (85%) getting the correct answers was on differentiating RCT from other study designs. Based on respondents who got the correct answers and the arbitrary cut-offs of >70%, 50-70% and <50% we categorized the questions as easy, moderately difficult and difficult. Table 2 shows 7 questions that were classified as easy, 10 as moderately difficult and 8 as difficult.

**Facilitating Factors and Barriers to the Application of Cochrane Reviews or Systematic Reviews in General**

The following factors help facilitate the use of CR as identified by more than 80% of the 52 respondents: 1.) efficient Internet access, 2.) working knowledge of research methodology, 3.) working knowledge of how to critically appraise the medical literature, and 4.) familiarity with the terms used in the review. On the other hand, the following were considered barriers for the application of SR by more

than 75% of the 52 respondents: 1.) inefficient access (Internet, library, reviews), 2.) poor knowledge of general research methodology, 3.) poor understanding of the principles of EBM, and 4.) difficulty in understanding the reviews (complicated technical terms). Cost was also considered as a barrier by 33% of the respondents.

**Table 2.** Description of Questionnaire Items

EASY	MODERATELY DIFFICULT	DIFFICULT
RCTs and Cohorts	Best method for selecting studies in SRs	General concept of Systematic Reviews (SRs)
Blinding in clinical trials	Directness of systematic review vis-a-vis the clinical question	Search strategy
Number Needed to Treat (NNT)	Drop-outs in clinical trials	Random allocation
Interpretation of the relative risk	Quasi-randomized trial	Allocation concealment in clinical trials
Interpretation of an SR output	Intention-to-treat analysis (ITT)	Measures of association
Interpretation of the abstract of a Cochrane Review	RCT over other study designs	Interpretation of an SR output
Interpretation of the abstract of a Cochrane Review	Measures of association	Forest plot
	Measures of Effect for quantitative outcomes	Forest plot
	Publication bias	
	Interpretation of the abstract of a Cochrane Review	

**Discussion**

The Philippine General Hospital (PGH) was purposively selected since it is the national university hospital of the Philippines. Although, the consultants in the study are not representative of the general population of medical practitioners in the country, it can represent a group of practicing physicians with similar characteristics – practicing physicians with specialty and sub-specialty training who teach in a medical school. Since the study’s population should be relatively well exposed to researches such as systematic reviews because of the academic setting, we assumed that the knowledge level that we will obtain will be slightly higher than that of the medical practitioners in general. Unfortunately some PGH consultants were not represented –those who were on-leave at the time of data collection and those who chose not to participate.

Application of our findings should take this into consideration.

Given the academic affiliation of our respondents, it is not surprising that 83% know about CR. This is probably an overestimate since we have excluded the non-responders, who are very likely to be also unaware of it. However even if we consider all the non-responders as unaware of CR, the 48.5% awareness of CR in this survey is still higher compared to awareness from other surveys ranging from 15-40%.<sup>12,13,14,15,16</sup> The difference might be due to the type of population sampled – ours were consultants from a teaching institution while the respondents of the other surveys were mostly general practitioners and postgraduate trainees.

Among those who are using the CR, 92% claimed to use them for literature review. Only 57% claimed they used it for teaching. This implies that they might be using CRs mainly as citations for their research papers. Coming from clinical departments in an academe, the less than 60% reported use of CRs in clinical practice, teaching, practice guideline or policy development is unfortunately low. If the usage is low in this expectedly high exposure setting, we could expect a dismally low usage in other institutions.

The average score was 14.7 out of a 25-item questionnaire on understanding SR. This is low considering the population comes from a teaching hospital. This is consistent with the results of other surveys in other countries, which asked the respondents if they understand enough to explain to others SR concepts such as 'relative risk', 'absolute risk' and 'number needed to treat'. The surveys<sup>13,14</sup> reported about 15-48% were comfortable enough to explain these concepts.

What we classified arbitrarily as moderately difficult and difficult questions can be used as guides in planning for educational modules. Concepts such as randomization, concealed allocation and interpretation of forest plots seem to be areas where we can focus since most of the respondents were not able to get the correct answers in this part. However, Cochrane abstracts seemed more easily understandable to majority of the respondents.

We seem to have identified the common enabling factors, to applying systematic and Cochrane reviews. These are efficient Internet access, working knowledge of research methodology and working knowledge of critical appraisal of medical literature, as well as familiarity with technical terms. This seems to be consistent with the very low scores in the knowledge part of the questionnaire. On the other hand, the absence of those factors, such as unavailability of internet access, ignorance of research methodology and lack of critical appraisal skills can be barriers to application and use of CR.

The major problem of the survey is the 58% response rate despite the following strategies: 1) A cover letter explaining in detail and in non-threatening way the nature and rationale of the study 2) Ensuring confidentiality, 2)

Sending the questionnaire in various forms – print and electronic forms, 3) Diligent follow-up of the respondents by investigators and assistants not only at their university offices but also at their private clinics using multimedia communication and access and 4) Providing a little incentive (not too costly to affect response).

We have attributed the low response rate to 1) the intimidating nature of the topic of the questionnaire, and 2) the busy schedule of the practicing clinical consultants.

A possible incidental outcome of the survey was that the project became a form of dissemination of key concepts of CR. Some doctors became very curious about the principles and concepts presented in the questionnaire that they sought the answers and their scores.

Our study targeted clinicians from a single tertiary care institution such that generalizability to Filipino clinicians is limited. Generalizability of our findings to our target population (the entire population of consultants of PGH) was also limited by the non-participation of some consultants and by the fact that some were on leave at the time of data collection. We recommend the conduct of further studies that includes a larger and more varied population and the use of a simplified shorter questionnaire to improve response rate.

### Conclusion

Of the 59 consultants from PGH who participated in this survey, 83% are aware of CR. Assuming that the remaining 42 who failed to participate are also not aware, this percentage will go down to 48.5%. At an average, the consultants were only able to get about 60% of the principles and concepts of understanding SRs. Access to internet, familiarity with terms and working knowledge of CRs and evidence-based medicine are the facilitating factors for application of the results of SRs and CRs. Although most claimed to use SR results in literature reviews, only about 60% are able to use them in teaching, clinical practice or health policy development.

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### Acknowledgments

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**Appendix**

PGH	-			
Respondent Number				

**Understanding and Application of Cochrane Reviews among Practicing Physicians at the Philippine General Hospital**

Data Collection Form

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Dear Dr. \_\_\_\_\_,

The Cochrane Collaboration provides a venue for valid synthesis of evidence addressing relevant prevention, diagnostic and therapeutic questions. In addition, the collaboration also promotes timely dissemination of these syntheses. It is envisioned that this timely dissemination can influence clinical practice thereby promoting optimum and equitable health care delivery. As of second quarter of 2009, 5785 reviews have been posted on its site [<http://www.cochrane.org/index.htm>]. Given the highly technical nature of the reviews, simplified educational materials have been developed and workshops have been conducted to promote understanding of such reviews.

We are conducting a study that aims to determine if the Cochrane reviews in the current format and dissemination mode are reaching the target end-users. The results of this study will be one of the bases of improving educational materials and programs to promote application of Cochrane Reviews.

The questionnaire is designed to identify key areas where we can improve comprehension and usage of the Cochrane reviews. Rest assured that we will only use this for purposes of the study and your identity and answers will be held in strict confidence.

In this connection, may we request you to complete the attached questionnaire in one sitting within 45 minutes (to make the testing conditions similar among the respondents).

You may email, mail, or fax this back to us at the contact details below. You may also call us and we will have it picked up from your office or clinic. Thank you for sharing your precious time with us.

Sincerely yours,

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PGH	-			
Respondent Number				

**General Information:** Please check the box that applies to you.

**Age(in years)**

**Gender**  Male  Female

**Specialty:**

<input type="checkbox"/> Anesthesia	<input type="checkbox"/> Pathology
<input type="checkbox"/> ENT	<input type="checkbox"/> Pediatrics
<input type="checkbox"/> Family & Community Medicine	<input type="checkbox"/> Psychology
<input type="checkbox"/> Internal Medicine	<input type="checkbox"/> Radiology
<input type="checkbox"/> Neuro Science	<input type="checkbox"/> Rehabilitation Medicine
<input type="checkbox"/> Obstetrics-Gynecology	<input type="checkbox"/> Surgery
<input type="checkbox"/> Ophthalmology	
<input type="checkbox"/> Orthopedics	<input type="checkbox"/> Others, -- specify <input type="text"/>

**Year graduated from Medical School**

**Year Graduated from your last post medical school training such as residency or fellowship**

**Part 1: Awareness of Cochrane Reviews**

1. Are you aware of the existence of Cochrane Systematic Reviews?  Yes  No  
 If you answered "Yes", please proceed to no. 2. If you answered "No", please proceed to Part 2.

2. How did you come to know about the Cochrane Systematic Reviews? (You may check more than 1.)

Undergraduate medical education

Residency/Fellowship Training

Scientific Convention/Conference

Medical Literature

Colleagues

Others, specify

3. Have you used a Cochrane Systematic Review?  Yes  No  
 If you answered "Yes", please tick the area/areas in which you applied the review.  
 If you answered "No", please proceed to Part 2.

Clinical Practice

Review of Literature



PGH	-			
Respondent Number				

<input type="checkbox"/>	Research	
<input type="checkbox"/>	Teaching	
<input type="checkbox"/>	Practice Guideline /Policy development	
<input type="checkbox"/>	Others, specify	<input type="text"/>

**Part 2: Understanding of Systematic Reviews (SRs) or Meta-Analyses**

Please write the letter corresponding to the best answer on the space provided.

- \_\_\_\_\_ 1. Which of the following statements about systematic reviews is accurate?
- A systematic review combines individual trials that have different research questions and nearly identical patient demographics.
  - A systematic review is restricted to combining double-blind randomized controlled trials.
  - Compared to an individual trial, a systematic review will show larger effects of treatment due to larger sample sizes.
  - A systematic review can increase the precision of results.
- \_\_\_\_\_ 2. Which of the following is the best method for selecting studies for systematic reviews?
- Have two or more reviewers evaluate each study
  - Divide the articles between two reviewers
  - Send the articles to experts in the field
  - Randomly select a subset of all eligible articles
- \_\_\_\_\_ 3. Which systematic review directly answers the clinical question "In a 60 year old woman with osteoporosis, how effective is weekly alendronate (70 mg) in preventing fractures?"
- Effect of weekly alendronate (70 mg) in preventing osteoporosis among elderly females at least 60 years of age
  - Effect of weekly alendronate (70 mg) in the development of fractures among elderly osteoporotic females
  - Effect of weekly alendronate (70 mg) in increasing bone density among postmenopausal females
  - Effect of weekly alendronate (70 mg) in osteoporotic women with > 1 previous fracture
- \_\_\_\_\_ 4. Which search strategy would increase the number of relevant articles on corticosteroids?
- corticosteroids AND steroids
  - adrenal corticosteroids NEAR prednisone
  - glucocorticosteroids NOT steroids
  - steroids OR adrenal corticosteroids
- \_\_\_\_\_ 5. Random allocation means:
- patients will not be told which treatment they will receive.
  - that treatment groups will have identical sample sizes.
  - that factors affecting study outcomes will be balanced between treatment groups.
  - that a random sample of eligible patients will be recruited.
- \_\_\_\_\_ 6. Randomized controlled trials (RCTs) are considered superior to cohort studies because:
- Patients are less likely to drop-out.
  - Patients are easily recruited for RCTs.
  - RCTs are better at minimizing bias.
  - RCTs participants are volunteers

PGH	-			
Respondent Number				

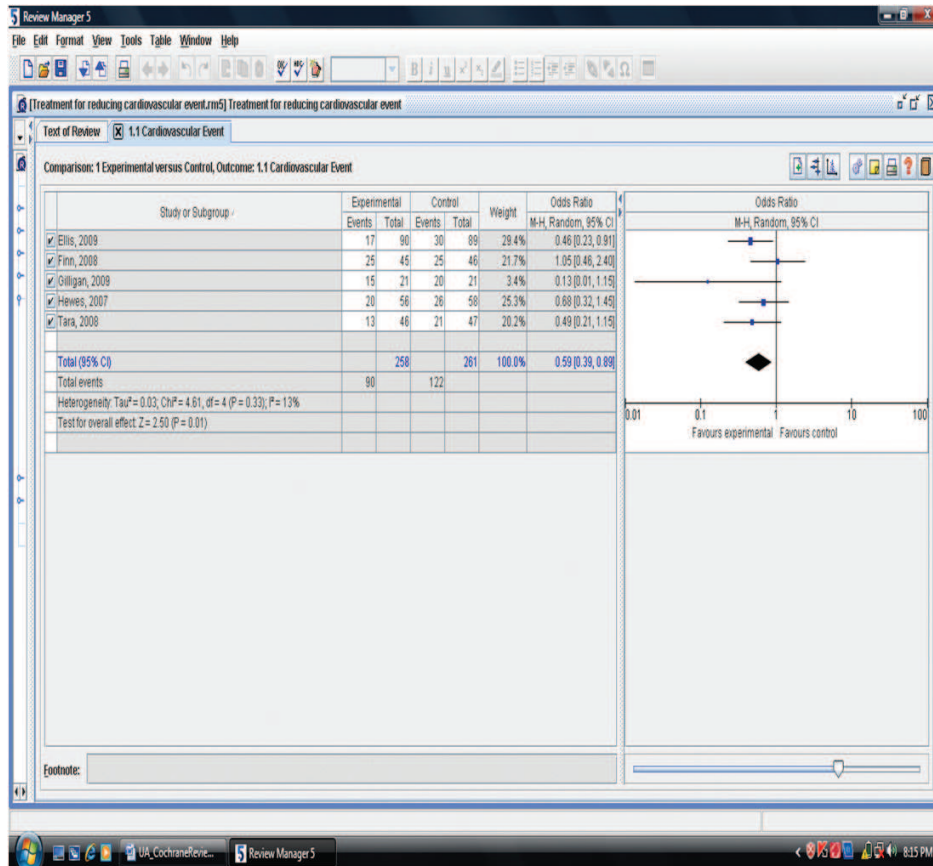
- \_\_\_\_\_ 7. A Randomized Controlled Trial comparing treatment A and treatment B reported concealment of treatment allocation. This refers to:
- patients not knowing whether they received treatment A or treatment B.
  - caregivers not knowing whether patients received treatment A or treatment B.
  - persons handing out the treatment not knowing whether they assigned treatment A or treatment B to patients.
  - outcome assessors not knowing whether patients received treatment A or treatment B.
- \_\_\_\_\_ 8. Which one of these statements about blinding in clinical trials is true?
- Blinding in clinical trials eliminates the subjectivity of the assessment of the outcomes.
  - Blinding ensures that the two treatment groups are equal in sample size.
  - Blinding ensures that patients are monitored without their knowledge.
  - Blinding is critical even for objective outcomes such as mortality.
- \_\_\_\_\_ 9. We should be worried about the drop-out rates in clinical trials when:
- The drop-out rates are equal in both the treatment group and the control group.
  - The drop-out rate in the treatment group is greater than in the control group.
  - The drop-out rate in the treatment group is lesser than in the control group.
  - There is a big difference in the drop-out rates between the two groups.
- \_\_\_\_\_ 10. Which of the following is a quasi-randomized clinical trial:
- Computer generated allocation sequence
  - Allocation sequence using tossing of coin
  - Alternate allocation
  - Allocation using table of random numbers
- \_\_\_\_\_ 11. Which of the following statement about intention-to-treat (ITT) analysis in clinical trials is TRUE:
- The patients should be analyzed based on what treatment they actually received.
  - Non-compliant patients should be excluded from the analysis.
  - ITT analysis can reveal if the drug can actually work in an ideal world setting.
  - The patients should be analyzed in the groups to which they were originally randomized.
- \_\_\_\_\_ 12. The main benefit of a randomized controlled trial (RCT) compared to other study designs is that the RCT:
- Is prospective thereby eliminating the need for historical data.
  - Has better external validity.
  - Guarantees that confounding bias will not occur
  - Tends to equalize known and unknown factors that may affect the outcome of interest.
- \_\_\_\_\_ 13. In a study to determine the association of high-fat diet with breast cancer, investigators age-matched 120 patients diagnosed with breast cancer with 120 patients hospitalized for other reasons. High-fat diet information was subsequently obtained and patients were classified whether or not their lifestyle includes a high-fat diet. The measure of effect/association that can be used for this type of study is the:
- Relative Risk
  - Odds Ratio
  - Mean Difference
  - Risk Difference
- \_\_\_\_\_ 14. In a randomized controlled trial comparing two post-stroke rehabilitation programs, 50% of the patients in program A and 25% of the patients in program B deteriorated after 3 months. The relative risk [for deterioration] of program A compared to program B is:

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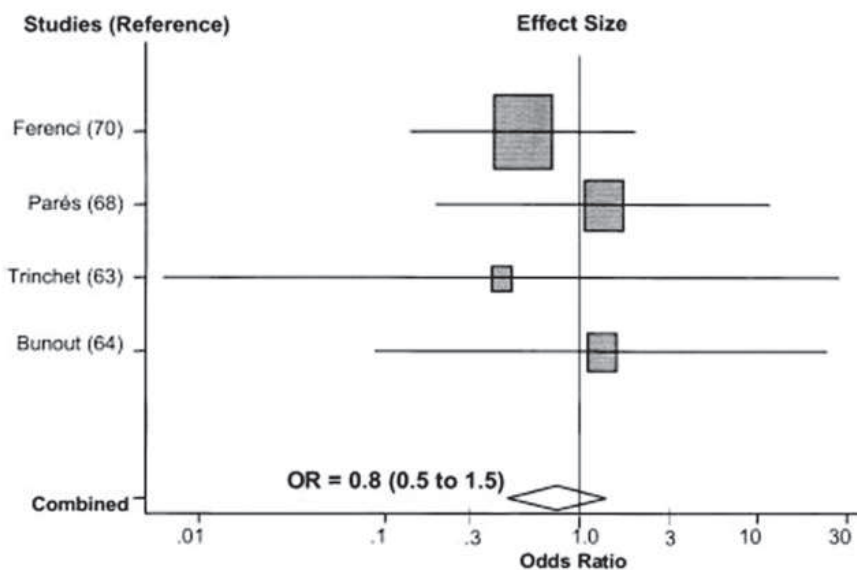
- a. 0.50
  - b. 2.00
  - c. 0.67
  - d. 1.50
- \_\_\_\_\_ 15. In a randomized controlled trial comparing Vitamin E and placebo in prevention of stroke among high risk patients, the number needed to treat [NNT] was reported to be 10. This means that:
- a. 10 patients should be given Vitamin E in order to prevent 1 stroke.
  - b. 10 patients should be given Vitamin E in order to prevent 10 strokes.
  - c. 1 patient should be given Vitamin E to prevent 10 strokes.
  - d. 10 patients should be given Vitamin E in order to prevent 100 strokes.
- \_\_\_\_\_ 16. In a cohort study investigating the effects of Vitamin D supplementation on the incidence of fracture among institutionalized elderly men and women within the 6-month observation period, the relative risk of Vitamin D supplementation relative to non-supplementation was reported to be 0.68. This finding favors\_\_\_\_\_.
- a. The non-supplementation group
  - b. The group of patients who had fracture
  - c. The Vitamin D group
  - d. The institutionalized group
- \_\_\_\_\_ 17. A randomized-controlled trial investigated the effect of diet plus herbal tea versus diet alone on weight loss among obese diabetic patients. The average weight loss of those who took herbal tea was 10 lbs. while the average weight loss on diet alone was 6 lbs. The effect of herbal tea is best expressed by:
- a. Mean Difference
  - b. Odds Ratio
  - c. Risk Difference
  - d. Average Risk
- \_\_\_\_\_ 18. The odds ratio of the Finn trial is 1.05 with a 95% confidence interval of 0.46 -2.40. This result favors the:
- a. Control group
  - b. Experimental group
  - c. Neither group
  - d. None of the above
- \_\_\_\_\_ 19. The 95% confidence interval of the summary odds ratio is 0.39 to 0.89. This means that:
- a. There is a 95% chance that the true summary odds ratio is between 0.39 to 0.89.
  - b. There is a 5% chance that the true summary odds ratio is between 0.39 to 0.89.
  - c. There is a 95% chance that the true effect is harmful.
  - d. There is a 5% chance that the true effect is beneficial.
- \_\_\_\_\_ 20. Which statement regarding this forest plot is FALSE?
- a. The Ferenci trial contributed the greatest weight to the pooled estimate.
  - b. The pooled estimate shows inconclusive result.
  - c. The study with the smallest sample size is the Ferenci trial.
  - d. All studies show inconclusive results.

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For numbers 18-19, refer to the results [presented below] of a systematic review of 5 randomized controlled trials comparing cardiovascular events in experimental and control groups:



The following is a forest plot for randomized placebo controlled trials reporting mortality results among patients with liver disease. For questions 20 and 21, please refer to the forest plot.



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- \_\_\_\_\_ 21. Which statement regarding precision in this forest plot is TRUE?
- Ferenci is more precise than Trinchet.
  - All trials are statistically significant.
  - The pooled point estimate is less precise than Ferenci.
  - The trials differ little in precision.
- \_\_\_\_\_ 22. Which of the following scenarios will result in publication bias?
- Studies published in the English and non-English language will be used
  - Studies done by pharmaceutical companies regardless of results will be included in the analysis
  - Studies registered in clinical trial registries will be sought and included.
  - Studies will be limited to trials published in peer-reviewed journals

For questions 23-25, please read the abstract from a Cochrane Review (presented on the following page):

**Abstract**

**Background**  
*Entamoeba histolytica* infection is common in developing countries, and up to 100,000 individuals with severe disease die every year. Adequate therapy for amoebic colitis is necessary to reduce the severity of illness, prevent development of complicated disease and extraintestinal spread, and decrease transmission.

**Objectives**  
 To evaluate antiamoebic drugs for treating amoebic colitis.

**Search strategy**  
 In September 2008, we searched the Cochrane Infectious Diseases Group Specialized Register, CENTRAL (2008, Issue 3), MEDLINE, EMBASE, LILACS, mRCT, and conference proceedings. We contacted individual researchers, organizations, and pharmaceutical companies, and checked reference lists.

**Selection criteria**  
 Randomized controlled trials of antiamoebic drugs given alone or in combination, compared with placebo or another antiamoebic drug for treating adults and children diagnosed with amoebic colitis.

**Data collection and analysis**  
 Two authors independently assessed the eligibility and methodological quality of trials, and extracted and analysed the data. We calculated clinical and parasitological failure rates, relapse, and adverse events as risk ratios (RR) with 95% confidence intervals (CIs), using a random-effects model. We determined statistical heterogeneity and explored possible sources of heterogeneity using subgroup analyses. We carried out sensitivity analysis using trial quality to assess the robustness of the results.

**Main results**  
 Thirty-seven trials, enrolling 4487 participants, met the inclusion criteria. Only one trial used adequate methods for randomization and allocation concealment, was blinded, and analysed all randomized participants. Only one trial used a *E. histolytica* stool antigen test. Tinidazole reduced clinical failure compared with metronidazole (RR 0.28, 95% CI 0.15 to 0.51; 477 participants, eight trials) and was associated with fewer adverse events. Compared with metronidazole, combination therapy resulted in fewer parasitological failures (RR 0.36, 95% CI 0.15 to 0.86; 720 participants, 3 trials).

**Authors' conclusions**  
 Tinidazole is more effective in reducing clinical failure compared with metronidazole and has fewer associated adverse events. Combination drug therapy is more effective in reducing parasitological failure compared with metronidazole alone. However, these results are based on trials with poor methodological quality so there is uncertainty in these conclusions. Further trials of the efficacy of antiamoebic drugs, with better methodological quality, are recommended. More accurate tests to detect *E. histolytica* are needed, particularly in countries where concomitant infection with other bacteria and parasites is common.

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- \_\_\_\_\_ 23. The number of trials included in this systematic review is:
- 1
  - 3
  - 8
  - 37
- \_\_\_\_\_ 24. The total number of patients included in the meta-analysis comparing tinidazole and metronidazole in 8 trials is:
- 477
  - 729
  - 2244
  - 4488
- \_\_\_\_\_ 25. Which of the following statement about this systematic review is true:
- Only randomized controlled trials comparing antiamebic drugs with placebo are included.
  - The main outcome was infection.
  - Both tinidazole and combination anti-amoebic drugs were found to be superior than metronidazole
  - Only good quality trials were included in this systematic review.

**Part 3: Facilitating Factors and Barriers to the Application of Cochrane Reviews or Systematic Reviews in General**

1. What do you think are the factors that facilitate the application of systematic reviews?

[You may choose more than one.]

- Efficient internet access
- Working knowledge of research methodology
- Working knowledge of how to critically appraise the medical literature
- Familiarity with the terms used in the review
- Others, specify

2. What do you think are the barriers to the application of Cochrane Systematic Reviews?

[You may choose more than one.]

- Inefficient access (internet, library, reviews)
- Poor knowledge of general research methodology
- Difficulty in understanding the reviews [complicated technical terms]
- Poor understanding of principles of EBM
- Costs
- Others, specify

**Thank you for your participation.**