



U. S. Cochrane Center Report

**North American Conference on Systematic Reviews**

**“Encompassing Diversity in Systematic Reviews”**

13-14 July 2006

Radisson Plaza Lord Baltimore

Baltimore, Maryland

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## 1. Executive Summary

This report summarizes the second meeting hosted by the US Cochrane Center (USCC) for US Cochrane contributors outside the annual meetings of the Cochrane Colloquium (conference program in Appendix A and Section 2 below). The Conference Planning Committee Members (see Appendix B) decided that, unlike the first meeting in 2004, systematic reviewers (Cochrane and non-Cochrane) from all of North America would be invited to participate in a conference that looked at the ways systematic reviews are being conducted and used across a wide variety of disciplines and organizations. The goal was to bring together these diverse groups producing and using systematic reviews to learn from each other and to provoke each other to think about their work in new ways. **“Encompassing diversity in systematic reviews,”** was chosen as the title of the conference to reflect the overall objectives, which were:

- To create and strengthen partnerships with others in the systematic review world as well as with policymakers, consumers, providers, educators, and others;
- To investigate ways to improve methodology and quality of systematic reviews; and
- To build a knowledge base through diversity in systematic reviews.

Speakers (see Appendix C) were invited to present on a variety of topics, including new methods being tested and used, ways in which evidence from systematic reviews is being used to inform health policy, and ethical issues associated with the intersection between systematic reviews and clinical research, among others. The conference agenda included plenary sessions, panel discussions, workshops, and poster sessions. The speakers -- and participants--hailed from the Cochrane and Campbell Collaborations, as well as other groups doing and using systematic reviews, government agencies, private foundations and organizations, advocacy organizations, journals, and educational and research institutions. They represent the fields of healthcare, social sciences, toxicology, biostatistics, health policy, and others. Based on personal and survey feedback, we believe the sessions and presentations included in this conference achieved the stated objectives.

This Conference provided a forum for systematic reviewers from diverse groups in North American and beyond to come together to discuss their work and address common questions. Common ground was established among systematic reviewers in that methods used for conducting systematic reviews are similar among many of the groups, although specific methods varied by question and discipline. Recurrent themes throughout the conference were on how to incorporate heterogeneous studies into systematic reviews and how to identify priority topics. The most common recurrent theme for users of systematic reviews was how to bridge the gap between a systematic review to EBHC and identify what clinicians need to make EBHC decisions in daily practice.

Continuing challenges of the US Cochrane Center include increasing awareness of the Cochrane Collaboration and Cochrane systematic reviews in the consumer and health professional communities, building on the potential of new relationships forged during the conference, increasing awareness and use of evidence-based healthcare, and obtaining financial support to continue the growth and development of the work of The Cochrane Collaboration in the United States.

## 2. Conference Agenda

**Thursday, July 13, 2006**

- 7:00 - 8:00 am      **Registration and continental breakfast**
- 8:00 - 9:30 am      **Pre-conference workshop:** *Introduction to systematic reviews*  
Hannah Rothstein, PhD
- 9:30 - 9:45 am      **Welcoming remarks**  
Kay Dickersin, PhD  
Mike Busch, State of Maryland, Speaker of House of Delegates
- 9:45 - 10:30 am     **Keynote address:** *The state of systematic reviewing in North America*  
Cynthia Mulrow, MD, MSc
- 10:30 - 10:45 am    **Break**
- 10:45 - 11:30 am    **Plenary:** *Mapping the landscape of what's happening in systematic reviews*  
**Chair:** Lorne Becker, MD  
*Government supported systematic reviews*  
Jeffrey Lerner, PhD  
*Non-government supported systematic reviews*  
Jesse Berlin, ScD  
*Open discussion*
- 11:30 am - 12:30 pm   **Panel:** *Different topics, different data, different audiences: What methods are appropriate?*  
**Chair:** Sally Morton, PhD  
**Panel members:**  
Randy Elder, PhD  
Michael Borenstein, PhD  
Hannah Rothstein, PhD  
Tracey Woodruff, PhD, MPH  
*Open discussion*
- 12:30 - 1:30 pm     **Lunch and concurrent poster session**

## North American Conference on Systematic Reviews (cont'd)

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- 1:30 - 2:15 pm     **Post-lunch think tank:** *Is there a common starting point for doing a systematic review?*  
**Chair:** Dan Fox, PhD  
*Is there a standard framework? Opinion*  
Mark Helfand, MD, MS, MPH  
*Is there a standard framework? Opinion*  
Julia Littell, PhD  
*Open discussion*
- 2:15 - 3:00 pm     **Plenary:** *Incorporation of systematic reviews into medical education*  
**Chair:** Luis Gabriel Cuervo, MD  
*Graduate medical education*  
Scott Richardson, MD  
*Undergraduate medical education*  
Frank Domino, MD  
*Open discussion*
- 3:00 - 3:20 pm     **Break**
- 3:20 - 5:00 pm     **Panel Discussion:** *Ethical dimensions and consequences of systematic reviews: A case study of apromin*  
**Chair and speaker:** Steve Goodman, MD, PhD  
*The (potential) role of systematic reviews in IRB oversight*  
Jeremy Sugarman, MD, MPH, MA  
*View of journals and journal editors*  
Trish Groves, MBBS, MRCPsych  
*View of funding agencies*  
Jean Slutsky, PA, MSPH  
*View of policy makers*  
Sean Tunis, MD, MSc  
*Open discussion*

### Friday, July 14, 2006

- 7:30 - 8:30 am     **Continental breakfast**
- 8:30 - 10:00 am     **Plenary:** *Everybody's problem: Ensuring quality and defending systematic reviews*  
**Chair:** Karen Robinson, MSc  
*Academic recognition*  
Kirby Lee, PharmD, MA  
*Conflicts of interest & outcomes of reviews*  
Joel Lexchin, MD  
*Heterogeneity of the evidence*  
Jeff Valentine, PhD  
*Quality of systematic reviews: what will it take to get a clinician to pay attention?*  
Richard Roberts, MD, JD, FAAFP, FCLM  
*Open discussion*
- 10:00 - 10:30 am     **Break**

## North American Conference on Systematic Reviews (cont'd)

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- 10:30 - 12:00 noon     **Plenary:** *Everybody's problem, continued: Ensuring quality and defending systematic reviews, cont'd*  
**Chair:** Eric Bass, MD, MPH  
*Assuring quality training: is there a gold standard and if so, how do we ensure it?*  
Kay Dickersin, PhD  
*Expanding capacity: How do we get more people well-trained?*  
Virginia A. Moyer, MD, MPH  
*The elephant in the room - When important reviews are not well done*  
Susan Norris, MD, MPH, MSc  
*Attacks on systematic reviews*  
Mark Gibson  
*Open discussion*
- 12:00 - 1:00 pm     **Lunch**
- 12:00 - 3:00 pm     **Concurrent poster session**
- 1:00 - 2:30 pm     **Simultaneous Workshops**
- Workshop 1.**     *Improving the quality of reviews submitted for publication*  
**Facilitators:** Steve Goodman, MD, PhD  
Cynthia Mulrow, MD, MSc
- Workshop 2.**     *Updating reviews*  
**Facilitators:** Lorne Becker, MD  
Roberta Scherer, PhD
- Workshop 3.**     *Drug Evaluation Review Project*  
**Facilitator:** Mark Gibson  
**Speakers:** Marian McDonagh, PharmD.  
Anthony V. Merola, RPh, MBA  
Duane Thurman
- 2:30 - 2:45 pm     **Break**
- 2:45 - 4:15 pm     **Panel discussion:** *Policy and practice based on best available evidence: The role of systematic reviews: A case study of implantable defibrillators and cost*  
**Chair:** Gil Ramirez, DrPH  
**Panel members:**  
Steve Phurrough, MD, MPA  
Naomi Aronson, PhD  
Barbara Warren, PsyD  
Gillian Sanders, PhD  
*Open discussion*
- 4:15 - 4:30 pm     **Close and evaluation**

### 3. Keynote Address

We were especially pleased to welcome **Cynthia Mulrow, MD, MSc, Professor, University of Texas Health Science Center at San Antonio and National Program Director, Robert Wood Johnson Foundation Generalist Physician Scholars Program**, as our keynote speaker.

During her address, “**The state of systematic reviewing in North America,**” Dr. Mulrow provided an overview of systematic reviewing in North America today. She addressed current signs of health, symptoms of illness, and suggested some remedies for the future in systematic reviewing.

Dr. Mulrow opined that synthesizing findings is as much a part of science as traditional research and that North Americans have long appreciated the need for systematic reviews, giving examples early research that fueled the development of methodological rigor in the conduct of a meaningful, objective review. Contributions by North Americans include the study of publication bias and techniques for quantitatively combining data. The growing impact of systematic reviews was shown by the increased number of reviews in MEDLINE and the increase in quality assessment from the 1960's to the present. She concluded that signs of health in systematic reviewing thus include a healthy appreciation of reviews, many resources on producing reviews, increasing numbers of reviews in the literature, improving quality and methodological advances.

The examples of the symptoms of “illness” in systematic reviewing that Dr. Mulrow presented were unpalatable presentation, inconsistencies in evaluating the quality of studies, lack of attention to the qualitative analysis, and over-adherence to theoretical methodological paradigms.

Dr. Mulrow presented several remedies to improve the state of systematic reviewing:

- Pay more attention to expert craftsmanship and less to factory-like production of meta-analyses;
- Use more qualified reviewers who are experts in the field and who have historical perspective, objective value judgement, and are willing to do large volumes of sifting the evidence;
- Expand the field beyond reviews on therapy;
- Increase the transparency of the process (e.g. production of a data table for each review) ;  
and
- Sort out when and how to update reviews, and when to drop a topic.

Dr. Mulrow concluded that the state of systematic reviewing in North America showed multiple signs of health, some symptoms of illness, but that there were many possible remedies for those symptoms of ill-health.

## 4. Summary of Plenary Sessions

### 4.1. Thursday, July 13, 2006

#### 4.1.1. Mapping the landscape of what's happening in systematic reviews

**Chair: Lorne Becker**, *Emeritus Professor of Family Medicine, SUNY Upstate Medical University.*

**Government-supported systematic reviews.** **Jeffrey Lerner**, *President and Chief Executive Officer, ECRI.* Dr. Lerner outlined the range of studies that governmental agencies support that could be classified as systematic reviews. These range from technology assessments with qualitative synthesis to rigorous systematic reviews. Federal and state government agencies commission reviews and meta-analyses for specific needs and support research more generally. Dr. Lerner also described the role of evidence-based practice centers (EPCs), funded by the Agency for Health Care Research Quality (AHRQ), in the development of systematic reviews. EPC reviews provide information to resolve clinical issues, support federal and state decision-making on coverage, inform research endeavors, and support private-sector initiatives.

**Non-government supported systematic reviews.** **Jesse Berlin**, *Unit Chief, Research Promotion and Development, Johnson & Johnson Pharmaceutical Research and Development.* Dr. Berlin presented a case study on the use of meta-analytic methodology within industry to evaluate safety, the possible increased risk of mortality from erythropoietin use in breast cancer patients. Combining information across supportive anemia trials from three pharmaceutical companies suggests a dose response effect. Analysis of the results showed that the difference in response rates to the drug was associated with survival time difference. Dr. Berlin suggested that this type of cooperative investigation could be used more often, for example, to evaluate safety and surrogate outcomes.

#### 4.1.2. Different topics, different data, different audiences: What methods are appropriate?

**Chair: Sally Morton**, *Vice President, Statistics and Epidemiology, RTI International.*

**Randy Elder**, *Director, Community Guide Branch, National Center for Health Marketing, Centers for Disease Control and Prevention (CDC).* Dr. Elder described the approach taken by the CDC in preparing public health systematic reviews for the Community Guide. Challenges include the broadness of most public health questions, heterogeneity of interventions, outcomes, study designs, and the need to make a decision based on the results of the review. His group conceptualizes the analytic framework, searches for and retrieves relevant studies, rates the quality

of the evidence, synthesizes the available evidence, and presents the evidence to the Task Force for approval of a summary recommendation. Often the synthesis is qualitative rather than quantitative because of heterogeneity. Decision-making is shared among many individuals with an attempt to use the entire body of evidence. The overall objective is to provide a reasonable answer to the public health question and to document how that decision was made.

**Michael Borenstein**, *Director, Biostat, Inc.* Dr. Borenstein focused on the need to distinguish between problems inherent in meta-analytic methods and problems in the way meta-analysis is being used. He suggested that although many individuals view heterogeneity as a problem related to meta-analysis, it can be viewed as a strength because individual study results reflect the effect of the intervention in a specific population and setting. Even when studies are heterogeneous, a consistent treatment effect can frequently be observed. Variations in results should be examined for underlying explanations. Dr. Borenstein showed examples illustrating his points.

**Hannah Rothstein**, *Professor of Management, Baruch College Zicklin School of Business and Co-Chair of the Methods Group, Campbell Collaboration.* Dr. Rothstein discussed how to handle systematic reviews for which there are no randomized controlled trials (RCTs) available or for which there is significant heterogeneity across studies. When there are no RCTs, Dr. Rothstein suggested that a systematic review can be completed with non-RCTs as long as study quality is taken into account in the data synthesis. Reviewers do not need to conduct a meta-analysis if one isn't appropriate but must do a good job of explaining why it isn't appropriate. The reviewer should provide more than a narrative summary or vote count. For example, the effect sizes and confidence intervals and a discussion of power for each study reviewed should be provided or a sign test based on direction of results, not significance, should be used. In conclusion, Dr. Rothstein suggested a joint meeting of the Cochrane and Campbell Collaborations to discuss these issues and opined that the two groups had much to learn from, and to contribute to, each other.

**Tracey Woodruff**, *Senior Scientist and Policy Advisor, United States Environmental Protection Agency.* Dr. Woodruff described the approach to evidence synthesis taken by the United States Environmental Protection Agency (EPA). Generally, the EPA is directed to prevent or reduce harm from environmental sources by evaluating all available evidence. The available evidence includes many types of studies (e.g., animal studies, case studies, occupational exposure epidemiology studies) and other data. Outcomes tend to be dichotomized to "cancer" and "everything else" (e.g., non-cancer). Studies are evaluated using a loose set of questions rather than assessing study quality stringently. In cancer, a "dose response number" is developed, similar to an odds ratio. In most non-cancer evaluations of health effects, a number for a "safe" level is determined by evaluating the lowest dose of response and defining "adverse" in that setting. The EPA uses the "weight of evidence," in which evaluations are made on quality and quantity of the data; summary of key evidence and supporting conclusions; all key decisions and their basis; and any data, analyses or assumptions unusual for or new to the EPA. Dr. Woodruff compared the EPA

approach with that used in developing a typical systematic review. Systematic reviews use more robust methods for collecting and evaluating data, but the EPA approach, with the need to come to a decision, has refined the use of Bayesian techniques to arrive at risk assessments. These estimates tend to be similar to those using simpler methods. Dr. Woodruff concluded her talk by pointing out the current lack of overlap and interaction among environmental, biomedical, and policy fields and suggested that the use of more robust methods such as systematic reviews and an interdisciplinary approach would strengthen each field.

#### **4.1.3. Post-lunch think tank: Is there a common starting point for doing a systematic review?**

**Chair: Daniel Fox**, *President, Milbank Memorial Foundation.*

**Mark Helfand**, *Director, Oregon Evidence-based Practice Center, and Professor, School of Medicine, Division of Medical Informatics and Outcomes Research.* Dr. Helfand presented a three-phase process to completing a systematic review: 1) the “self-satisfaction” phase, or development of the systematic review (using the Cochrane Collaboration as an example); 2) the “cognition” phase, when people started to read systematic reviews; and 3) the “combat” phase, during which resource allocations are based on the results of systematic reviews. He believes that systematic reviews should be generated by patient care needs and that users should drive the way systematic reviews are conducted, including focus on outcomes of importance to patients. Review groups vary in standards used for conducting systematic reviews. Citing examples from the Drug Effectiveness Review Project, the Cochrane Collaboration, the EPC program and pharmaceutical companies, Dr. Helfand discussed the methodology of systematic reviews and the use of observational studies in reviews. Although there is necessary variation in conducting systematic reviews due to differences in disciplines, transparency and predictability are mandatory.

**Julia Littell**, *Associate Professor, Bryn Mawr College and Campbell Collaboration.* Dr. Littell, as editor and co-chair of the Campbell Collaboration’s social welfare group, works with the Cochrane Collaboration to identify differences in Cochrane and Campbell review practices. She noted that although the two frameworks for conducting systematic reviews are not entirely consistent, there are similarities and both produce methodologically sound reviews that are more rigorous than narrative reviews. Both organizations strive to produce reviews with minimal bias and sound scientific methodology. Dr. Littell also discussed differences between Cochrane and Campbell, using their approaches to problem formation and search strategies as examples. She discussed some of the problems that result from a lack of standardization, but acknowledged that providing options may serve the scientific community better than formulating a single standard model for conducting a systematic review.

#### 4.1.4. Incorporation of systematic reviews into medical education

**Chair: Luis Gabriel Cuervo**, *Unit Chief, Research Promotion and Development, Pan American Health Organization.*

**Undergraduate medical education. Frank Domino**, *Associate Professor of Family Medicine and Community Health, University of Massachusetts Medical School.* Dr. Domino described the increased attention to teaching evidence-based healthcare at the medical undergraduate level as arising from a 1999 Institute of Medicine (IOM) report, “To Err is Human”, where a substantial proportion of patient deaths due to medical error was reported. One IOM recommendation was to focus on better utilization of information technology. From this recommendation, the Liaison Committee on Medical Education (LCME) added three objectives to the Medical School Objectives Project: 1) Develop the ability to critically evaluate the knowledge base supporting good patient care; 2) Understand the gap between prevailing and best practices; and 3) Participate in closing the gap between prevailing and best practices. As a result, many medical schools now incorporate problem solving and use of “best evidence” teaching in the first 2 years of undergraduate medical education, with some formal instruction in evidence-based healthcare (EBHC) in the clinical years. These efforts have led to recognition of the validity of EBHC by many physicians, although there are still some sub-specialties that resist the concept. Dr. Domino ended his talk by expressing the hope that the evidence could be more easily accessible at bedside, that there could be more encompassing (“umbrella”) reviews, and that there could be more consumer involvement in development of EBHC practices.

**Graduate medical education. Scott Richardson**, *Professor of Medicine at Wright State University Boonshoft School of Medicine.* Barriers to teaching EBHC at the post-graduate level include the limited number of hours available for teaching residents, faculty available to teach EBHC, and the overwhelming amount of medical information that must be absorbed during the post-graduate years. Dr. Richardson outlined three situations and three corresponding teaching models to teach EBHC effectively. The teaching situations are those where 1) an individual, 2) a small team, or 3) a majority of individuals are interested and involved in teaching and supporting EBHC. The teaching models include 1) role modeling, 2) “weaving”, and 3) “targeting”. Dr. Richardson suggested that each of the teaching models could be used in any of the situations. He concluded by questioning the stability of any effect observed from teaching EBHC, e.g., whether residents continue to practice EBHC after exposure and whether they use systematic reviews in practice.

#### **4.1.5. Ethical dimensions and consequences of systematic reviews: A case study of aprotinin**

**Chair: Steven Goodman**, *Associate Professor, Johns Hopkins Bloomberg School of Public Health and School of Medicine University.*

**Steven Goodman.** Dr. Goodman discussed lessons from the story of clinical trials conducted to test the effectiveness of aprotinin for reduction in bleeding after cardiac surgery. We know now that 64 randomized controlled trials were reported between 1987 and 2002, at least 52 after 1992, when the effectiveness of aprotinin was established. Why was no one keeping track of all RCT results and whose responsibility is this? Dr. Goodman contended that physicians are ethically obliged to treat patients in accordance with existing knowledge and a part of this process includes searching for relevant evidence before initiating treatment. A current topic of debate is the appropriate role of systematic reviews in proposing and reporting a randomized controlled trial. Suggestions included requiring systematic reviews before randomized controlled trials are funded and in conjunction with publication of trial results.

**Jeremy Sugarman**, *Harvey M Meyerhoff Professor of Bioethics and Medicine, Phoebe R. Berman Bioethics Institute and Johns Hopkins University School of Medicine.* Dr. Sugarman discussed the relationship of systematic reviews to doing ethical research. He noted that systematic reviews inform institutional review boards (IRBs) of the value of proposed research and the results from systematic reviews may refine the likely harm-benefit ratio. Requiring systematic reviews to accompany new applications for research and summarizing available results in informational documents provided to participants are possible approaches, but IRBs generally lack resources to appropriately interpret systematic reviews. Thus, systematic reviews are limited in their capacity to inform the IRB decision-making process.

Dr. Sugarman also suggested that investigators have obligations, including fiduciary obligations, to study participants and should take account of all available evidence in conducting research. Investigators should protect study participants, assure the credibility of study results, and remember the credo "I will help and at least not harm." Dr. Sugarman opined that he would add journals to the list of entities that have obligations to patients.

**Trish Groves**, *Deputy Editor, BMJ.* Dr. Groves discussed ethical considerations for investigators participating in randomized trials and for authors conducting systematic reviews. Research ethics committees should insist on systematic reviews of previous research, summaries of relevant systematic reviews for potential participants, registration of clinical trials at inception, and a commitment by investigators to making results public. Journal editors should request systematic reviews to accompany reports of clinical trials and discussions of the strengths and weaknesses of current research based on the results of these reviews. Systematic review authors have the expertise

to identify ethical lapses during the course of appraising identified research. This includes research misconduct, poorly designed research, and lack of informed consent or ethics approval. Dr. Groves suggested that systematic review authors discuss any ethical lapses that they discover with original authors as part of the systematic review.

**Jean Slutsky**, *Director, Center for Outcomes and Evidence, Agency for Healthcare Research and Quality*. Ms. Slutsky discussed the challenges of designing and conducting systematic reviews. Conflicts of interest and publication bias affect whether research findings are published and the exclusion of unpublished literature in systematic reviews may impact conclusions and recommendations for practice. A further challenge is identifying topics relevant to target audiences and topics that impact the decision-making process. Funding agencies use systematic reviews to identify gaps in research and to set funding priorities. Ms. Slutsky challenged authors to ask the right questions and establish systematic reviews as priority research.

**Sean Tunis**, *Founder and Director, Center for Medical Technology*. Dr. Tunis discussed the challenge of translating evidence into discrete policy decisions. Medicare offers coverage and pays for items and services deemed reasonable and necessary based on safety, efficacy, and evidence of improved outcomes. Dr. Tunis presented an example of Medicare coverage of the implantable cardioverter defibrillator (ICD) for the prevention of sudden cardiac death. Initially, Medicare coverage of ICDs was approved in June 2003 for a small group of patients based on results from a single trial. This trial may have had been biased in selecting unstable patients. Dr. Tunis presented the results of additional trials of ICDs and reported that coverage was expanded in 2004 after the results of meta-analyses revealed a treatment benefit. At the time of this presentation, data had just been released on 45,000 ICD implants. The revised Medicare coverage and payment policy currently is linked to submission of data to a national registry where the type of patients treated and complications rates will be tracked.

## **4.2. Friday, July 14, 2006**

### **4.2.1. Everybody's problem: Ensuring quality and defending systematic reviews (Part 1)**

**Chair: Karen Robinson**, *Deputy Director, Evidence-based Practice Center at the Johns Hopkins School of Medicine*.

**Academic Recognition. Kirby Lee**, *Assistant Professor of Clinical Pharmacology, University of California, San Francisco and US Cochrane Center, San Francisco Branch*. Dr. Lee discussed barriers to conducting a Cochrane or other systematic review from the perspective of an academician. He outlined the conventional ways to achieve advancement and promotion in academia (teaching and mentoring, clinical service, university and public service, and research and

publications) and the typical distribution of work time for clinician-investigators and clinician-educators. Barriers to conducting systematic reviews include lack of time, lack of funding, lack of academic recognition, and that publication in the Cochrane Database of Systematic Reviews (CDSR) currently is not associated with a journal impact factor. Dr. Lee discussed strategies to improve the efficiency of conducting systematic reviews and to find funding mechanisms to protect time to conduct systematic reviews.

**Conflicts of interest and outcomes of reviews.** **Joel Lexchin**, *Associate Professor, York University School of Health Policy and Management and Emergency Department, University Health Network, University of Toronto School of Medicine*. Dr. Lexchin reported that industry far outnumbers other sources in funding research, and, therefore, plays an important role in making the “rules” for clinical research. In addition, corporate funding is increasingly moving into the community. Industry-sponsored studies are more likely to show stronger positive effects of treatment than studies with other funding sources. Dr. Lexchin discussed examples of industry-funded studies that showed a higher level of conflict of interest when compared with similar studies with other sources of funding. He also discussed production of practice guidelines, in which there is a conflict of interest when an author relationships with industry predates the guideline process. Dr. Lexchin concluded that source of funding does influence the outcomes of reviews and that conflict of interest exists in recommendations from clinical research, production of guidelines and what appears in medical journals.

**Heterogeneity of the evidence.** **Jeffrey C. Valentine**, *Assistant Professor, Duke University and Co-Chair and Editor for the Methods Group, Campbell Collaboration*. Dr. Valentine began by stating that studies are based on samples and sample statistics vary due to sampling error, often resulting in heterogeneity, which can be calculated using standard tests. Dr. Valentine discussed the problems associated with a lack of an *operational* definition for heterogeneity, i.e., how much heterogeneity is too much. Without a standard operationalized definition, the analytic decision-making process could be biased or different researchers could reach different conclusions using results from the same studies. He recommended three strategies for deciding whether or not to conduct a meta-analysis: (1) when there are two or more studies; (2) when the statistical test for heterogeneity can be conducted fairly (i.e., under adequate statistical power); and (3) when a critical moderator tests can be conducted fairly (tests which reviewers identify *a priori* as being critical to the interpretation of their results). Dr. Valentine concluded by stating that reviewers should not ignore heterogeneity but also should not use undefined heterogeneity as a reason for not combining study results.

**Quality of systematic reviews: What will it take to get a clinician to pay attention?**  
**Richard Roberts**, *Professor of Family Medicine, University of Wisconsin School of Medicine and Public Health*. Dr. Roberts provided a clinical perspective on the usefulness of systematic reviews. Clinicians’ multiple responsibilities often prevent reading and acquiring knowledge of the evidence.

He discussed clinicians' suspicions about evidence-based medicine and the limitations of evidence-based medicine that are universal - and unique - to the practice of medicine. He suggested that systematic reviews could be improved in several ways: pick topics that matter; improve the evidence; engage clinicians and their groups; and develop user-friendly tools.

#### **4.2.2. Everybody's problem: Ensuring quality and defending systematic reviews (Part 2)**

**Chair: Eric Bass**, *Director, Evidence-based Practice Center, and Professor of Medicine, Johns Hopkins School of Medicine*. This session was continued after the break.

**Assuring quality training: Is there a gold standard and if so, how do we ensure it? Kay Dickersin**, *Director, United States Cochrane Center and Director and Professor, Center for Clinical Trials, Johns Hopkins Bloomberg School of Public Health*. Dr. Dickersin discussed available systematic review course resources and differentiated between courses *about* systematic reviews, which provide an overview of the field, and courses that describe *how to perform* systematic reviews. Typically, courses on how to perform reviews teach a single method, focus on exposure to tools, and offer opportunities to enhance technical competence. Teaching methods include didactic lectures, small group sessions, and one-on-one instruction. Dr. Dickersin described a basic structure for courses, but concluded that there is no evidence to suggest that there is a gold standard for teaching systematic review methodology.

**Expanding capacity: How do we get more people well-trained? Virginia A. Moyer**, *Professor, Center for Clinical Research and Evidence Based Medicine at the University of Texas, Houston Health Science Center*. Dr. Moyer discussed barriers to training researchers in systematic review methodology. Barriers include subsets of researchers who have not heard of systematic reviews or are unable to recognize quality reviews and perform good reviews. Establishing a demand for systematic reviews and rewarding those who undertake reviews are possible solutions to the problem. Dr. Moyer concluded that researchers will be well-trained "when the barriers are few enough and the demand and rewards are great enough."

**The elephant in the room – When important reviews are not well done. Susan Norris**, *Investigator, Evidence-Based Practice Center, Oregon Health and Science University*. Dr. Norris discussed how to define and assess the quality of reviews and ongoing efforts to improve the quality of systematic reviews. Reviewers should perform reviews using methods that minimize bias and address applicability. Tools for assessing quality include the QUOROM statement (Moher 2001), the 23 tools and 4 checklists identified by Shea (2000), and the Quality Assessment Questionnaire (OQAQ) (Oxman and Guyatt 1991). Dr. Norris concluded that stakeholders should be considered throughout the quality assessment process and reviews should be understandable and useful.

Additionally, understanding how to rate the evidence and widespread use of validated instruments are crucial to improving quality.

**Attacks on systematic reviews.** **Mark Gibson**, *Deputy Director, Center for Evidence-Based Policy at Oregon Health and Science University*. Mr. Gibson presented his recent experiences with the Drug Effectiveness Review Project (DERP) and his experience with attacks on systematic reviews. Attacks on DERP include (1) a narrow scope, inadequate to inform policy, (e.g., exclusive use of randomized controlled trials), and (2) insufficient attention to individual patient differences. Mr. Gibson noted that, in his experience, policy makers consider systematic reviews to be credible and often use them to help make difficult decisions. Policy makers appreciate good research but may require guidance on how to judge study quality.

#### **4.2.3. Policy and practice based on best available evidence: the role of systematic reviews: A case study of implantable defibrillators.**

**Chair: Gil Ramirez**, *Director and Professor, Urban Public Health Program, Charles R. Drew University of Medicine and Science and Cochrane Health Care of Older People Field*.

**Steve Phurrough**, *Director, Coverage and Analysis Group, Centers for Medicare & Medicaid Services*. Dr. Phurrough described the history of use of ICDs and assessment for coverage at the Centers for Medicare & Medicaid (CMS). The CMS office that decides on coverage is independent of the office funding the coverage, with most decisions to pay made at the local level. The principle used when deciding on coverage is whether the intervention is “reasonable and necessary.” If an intervention is determined to be important enough, a decision may be made for coverage at the national level. Cost isn’t considered when making the decision regarding coverage at the national level but it does come into play in determining reimbursement. Dr. Phurrough showed how, as more and more evidence became available, the decision to cover the costs associated with the use of ICDs changed.

**Naomi Aronson**, *Executive Director, Evidence-Based Practice Center at the Technology Evaluation Center for Blue Cross and Blue Shield Association*. The various Blue Cross and Blue Shield plans are independent companies and each makes independent decisions regarding medical policy, coverage policy and payment policy. The Technology Evaluation Center (TEC) does not determine coverage policy but is concerned with rigorous assessment of clinical evidence and systematic reviews (technology assessments). The Center solicits advice from an independent Medical Advisory Panel. Coverage decisions are not made based on cost. Although some conventions regarding cost effectiveness thresholds exist, they are of limited benefit and there are no standard, accepted cut-offs for determining coverage policy. Dr. Aronson displayed the evidence table developed by TEC for ICDs showing the number needed to treat for a benefit to be realized.

Dr. Aronson completed her talk by describing the gap between technology assessment and clinical utility and improved health.

**Gillian Sanders**, *Associate Professor of Medicine, Duke Clinical Research Institute*. Dr. Sanders described the cost effectiveness study she had completed on the use of ICDs in primary prevention of cardiac death and morbidity. Issues considered in the study of eight primary prevention trials include the substantial initial cost of the device, continuing costs for battery replacement, and quality of life with adjustments for age and current health. Prophylactic ICD use appears to be cost-effective in defined primary prevention populations. Two of eight trials found no mortality benefit; the remaining six found benefit of increased life expectancy and cost effectiveness ranging from \$34,000 to \$70,200 per quality-adjusted life year.

**Barbara Warren**, *Director, Organizational Development, Planning & Research of the Lesbian, Gay, Bisexual & Transgender Community Center*. Dr. Warren presented the viewpoint of the consumer. She posited that everyone is a consumer of healthcare at some point in time, and that there is an issue of access only when the consumer does not have the resources, either financial or other, to obtain necessary health services. Income has an impact on health care decisions. Most consumers are “indirect payers,” especially for higher cost procedures, using private or public insurance, which is a tax burden. Critical decisions regarding allocation of resources must be based on reality.

## 5. Workshops

Four workshops were offered to conference attendees. A pre-conference workshop aimed to provide a basic understanding of systematic reviews for those individuals with no or little experience in the field. Three simultaneous workshops were offered later in the conference to discuss publication, updating, and use of systematic reviews. Brief summaries of these workshops follow.

### 5.1. Thursday, July 13, 2006

#### 5.1.1. Introduction to systematic reviews

**Hannah Rothstein**, *Professor of Management, Baruch College Zicklin School of Business and Co-Chair of the Methods Group, Campbell Collaboration*. Dr. Rothstein provided participants with an overview of a systematic review, explaining a five-stage process to develop one. She emphasized the importance of identifying all relevant literature. Dr. Rothstein provided explicit examples of how reviews could be employed in clinical practice and decision making. She expressed concern that even high-quality systematic reviews from the Cochrane Collaboration often conclude that there is insufficient evidence to recommend an intervention. Additional discussion focused on

dissemination; the differences between social and scientific research; bias; methodologic details, including effect size, missing data, and choice of outcome variables; quantitative vs. qualitative synthesis; and sensitivity analysis.

## 5.2. Friday, July 14, 2006

### 5.2.1. Improving the quality of reviews submitted for publication

**Facilitators:** **Steven Goodman**, *Associate Professor, Johns Hopkins Bloomberg School of Public Health and School of Medicine University*; and

**Cynthia Mulrow**, *Professor, University of Texas Health Science Center at San Antonio and National Program Director, Robert Wood Johnson Foundation Generalist Physician Scholars Program*. The workshop began with Drs. Goodman and Mulrow polling the workshop participants for topics of interest to discuss during the workshop. The following ten topics were proposed:

- Mentorship and training;
- Word limits in major journals vs. electronic publications;
- Non-Cochrane standards for systematic reviews;
- How/when you know you are “done” with the research for a review;
- Bounding best evidence;
- Limitations of systematic reviews;
- Quality and quality assessment of observational studies for systematic reviews;
- Most important quality issues;
- Non-validated outcomes; and
- Search strategies and level of detail for presentation.

Dr. Goodman addressed the importance of assessing qualitative heterogeneity, the penultimate step before conducting statistical reviews for heterogeneity. He recommended strategies to incorporate qualitative synthesis into systematic reviews, to focus more on qualitative pooling than on the quantitative but also to present details of the pooled data. These aspects take account of the different demands that “clinical” and “methodological” readers have.

He explained that having expert participation in a systematic review to interpret results versus objective presentation of the results must be dealt with in a balanced way. The results of a review must be put in the context of the research, implementation and practitioner experience. The consensus was that reviews require participation of individuals with a deep knowledge of the topic, knowing that there is also a risk that experts may be biased (typically in favor of one treatment). Systematic reviews also require involvement of methodologists.

### 5.2.2. Updating Reviews

**Facilitators:** Lorne Becker, *Associate Director, Center for Medical Consumers; and*

**Roberta Scherer,** *Associate Director, US Cochrane Center, Johns Hopkins Bloomberg School of Public Health.*

Drs. Roberta Scherer and Lorne Becker discussed updating systematic reviews in the context of the Cochrane Collaboration. Dr. Becker noted that, typically, Cochrane reviews are updated every 2 years, some are updated more frequently, and those with no further updates required are “closed”. Triggers for updates include new studies, outcomes, indications, and disease classifications. Reviews are updated by repeating a search for studies, assessing new studies, and revising the qualitative and quantitative analyses as appropriate. Substantive updates have meaningful changes.

Dr. Scherer presented the results of a systematic review conducted by Moher *et al* (2006) of studies assessing how and when to perform updates to systematic reviews. The protocol was published in *Cochrane Database of Methodology Reviews* 2006, Issue 2 of *The Cochrane Library*. Moher *et al* identified five strategies for maintaining an updated review and two statistical methods for updating reviews. Three general strategies included a commitment from authors to perform updates every two years, eligibility criteria for new studies based on the original protocol, and using in-progress citations for updating reviews. Cumulative meta-analyses and a test for identifying null meta-analyses that require updating were the two statistical methods. Moher *et al* concluded that there are limited descriptions of methods for updating reviews, no information on the cost of updating, and statistical methods only apply to quantitative syntheses. An expert group working on updating systematic reviews (Cochrane Updating Working Group) was convened in March 2006 (Rob Sholten, Convenor). The group developed a provisional model for updating reviews to “incorporate concepts and explain how people make decisions.” The group suggested that the model be used to frame future discussions, that the responsibility to update reviews should be promoted at professional meetings, that more methodological research is required, and that partnerships between organizations and investigators should be formed to encourage timely updates. A question and answer period followed.

### 5.3.2. Drug Effectiveness Review Project (DERP)

**Facilitator:** Mark Gibson, *Deputy Director, Center for Evidence-based Policy at Oregon Health and Science University.*

**Speakers:** Marian McDonagh, *Drug Review Director, Evidence Based Practice Center, Oregon Health and Science University.;*

**Anthony V. Merola**, *Pharmacy Consultant, Pharmacy Policy and Operations Unit, Office of Medicaid Management, New York State Department of Health; and*

**Duane Thurman**, *Director, Prescription Drug Program, Washington Health Care Authority.*

The DERP workshop provided information about the effects of the project on the pharmaceutical industry and state and local governments. Mr. Gibson reported that DERP reviews evidence on effectiveness of drugs in the same class, scores the quality, and makes the information available to the public and policymakers. State and local governments, in their efforts to be cost-efficient and to provide evidence-based healthcare, use DERP to determine preferred drugs for coverage. Additionally, DERP is having an effect on pharmaceutical companies interested in scoring well on the quality assessment.

## **6. Posters**

Posters, grouped by topic area, are summarized below.

### **6.1. Survey of North American activities**

**6.1.1. Ervin AM.** Baltimore, Maryland. **The Cochrane Eyes and Vision Group (CEVG).** The author described the goals of the CEVG and training opportunities for those interested in evidence-based healthcare and systematic review preparation. The CEVG, US Satellite offers support to systematic reviewers and workshops on systematic review preparation, evidence-based ophthalmology and optometry, handsearching, and peer review.

**6.1.2. Cumpston MS, Grimshaw JM, Schaafsma M,** Toronto Ontario. **The Cochrane Collaboration in Canada.** The activities of the Cochrane Collaboration in Canada and the influence of Cochrane reviews in Canadian healthcare decision making were summarized. Canadian researchers have contributed approximately 10% of the systematic reviews published in *The Cochrane Library* and led nine of the top 50 Cochrane reviews accessed in February 2005.

**6.1.3. Hamilton M for CUE,** Baltimore, Maryland. **Consumers United for Evidence-based Healthcare (CUE): A model for building a national consumer advocacy coalition.** The formation and vision of CUE was presented. The 16 current CUE members are united by a common interest in integrating understanding and interpretation of evidence-based healthcare into their advocacy activities. Members work to strengthen the voices of consumers and provide leadership in healthcare research and provide a unique and valuable input to the activities and mission of the Cochrane Collaboration.

**6.1.4. Trudeau KJ, Falzon L, and Davidson KW**, New York, New York. **Aiming Towards Outreach: [www.cochranebehaviormed.org](http://www.cochranebehaviormed.org)**. The authors described the aims of the Cochrane Behavioral Medicine Field (registered February 27, 2006) and their efforts to achieve these aims. Information is provided to others using comprehensive search strategies and outreach by developing and maintaining an Internet website, which was presented. Feedback was invited from Cochrane affiliates about how to best inform and engage colleagues in the Cochrane mission.

## **6.2. Systematic reviews and policy**

**6.2.1. Sledge I<sup>1</sup>; Estok R<sup>1</sup>; Gunnarsson C<sup>2</sup>** Medford, Massachusetts<sup>1</sup> Cincinnati, Ohio<sup>2</sup>. **Integrating a systematic review of the bariatric literature into a web-based portal to facilitate evidence-based decisions in the surgical management of morbid obesity**. The authors described integration of a comprehensive database of information from the bariatric surgery literature into a web-based portal for access by multiple stakeholders. The web-based portal provides stakeholders with a comprehensive, current, and easily accessible resource to inform evidence-based decisions on the future direction of surgical treatment for morbid obesity.

**6.2.2. Abrami PC, Bernard RM**, Montreal, Quebec. **Systematic reviews, policy and practice: Issues in the development of an argument catalogue**. An Argument Catalogue was proposed as a tool to systematically compile evidence on a topic of interest. The Argument Catalogue is used to analyze and characterize documents from multiple sources, including the print media, practitioners, policy makers, reviewers of research and primary researchers.

**6.2.3. Freeman SR, Dellavalle RP**. Denver, Colorado. **Case report of an experience with co-publication of a Cochrane systematic review**. The authors described journal resistance to co-publishing a published Cochrane systematic review in a print journal.

## **6.3. Challenges in conducting a systematic review**

**6.3.1. Mohan P**, Houston, Texas, **Asim O**, Oxford, UK. **The effect of patient isolation measures for infants with *Candida* colonization or infection on the transmission of *Candida***. The authors described methods for conducting a systematic review of the effect of patient isolation measures for infants with *Candida* colonization or infection, as an adjunct to routine infection control measures in a neonatal unit. Trials in this area typically use cluster randomization with the unit of randomization being the neonatal care unit.

**6.3.2. Pennick V, Kennedy C, Wang A, Widdrington H, Sinclair S, Irvin E, Mahood Q, Guzman J**, Toronto, Ontario. **Using the GRADE approach to summarize the evidence from systematic reviews and clinical practice guidelines in chronic low back pain**. The authors described their experience using GRADE to extract and synthesize data on patient-centered

outcomes from high quality guidelines and systematic reviews. This work was done in the context of an update of a 1998 review on the treatment of chronic low-back pain for the Ontario Workplace Safety and Insurance Board's Program of Care (POC) for Chronic Pain. The authors concluded that the GRADE approach offers a more informative way of presenting patient-centered outcome data for decision-making.

#### **6.4.4. Evidence practice gap**

**6.4.1. Torres SR, Nikitakis NG, Anjum S, Meiller TF, Baltimore, Maryland. *Candida* colonization in oral lichen planus lesions.** This systematic review investigated the frequency of *Candida* colonization in *oral lichen planus* (OLP) lesions and the efficacy of antifungal treatment (AFT) for OLP management for this condition. The authors concluded that although *Candida* colonization is significantly associated with OLP lesions and AFT appears justified in *Candida*-positive OLP patients, more objective measures of treatment outcomes are necessary.

**6.4.2. Gartlehner G<sup>1</sup>, Hansen RA<sup>1</sup>, Nissman D<sup>2</sup>, Thieda P<sup>1</sup>, Lohr KN<sup>3</sup>, Carey TS<sup>1</sup>, Chapel Hill, North Carolina<sup>1</sup>, Charleston, South Carolina<sup>2</sup>, Research Triangle Park, North Carolina<sup>3</sup>. A simple and valid tool to distinguish effectiveness from efficacy studies.** The authors conducted validation studies on a 7-item instrument to distinguish effectiveness (pragmatic) from efficacy (explanatory) trials. The authors found that, applied in a standardized matter, the proposed items provided for a valid and simple tool to distinguish effectiveness from efficacy studies.

**6.4.3. Yen H-R, Chang H-H, Taoyuan, Taiwan. From experience-based toward evidence-based: Application of evidence-based traditional Chinese medicine in Chang Gung Memorial Hospital, Taiwan.** The authors described the process of applying evidence-based traditional Chinese medicine (TCM) in a university-affiliated tertiary medical center in Taiwan. Although TCM has been widely used for centuries, there has been little scientific characterization of components of TCM. Starting in 2006, the Center for TCM in Chang Gung Memorial Hospital has been using clinical trial methodologies to test TCM so as to foster evidence-based patient care.

#### **6.5. Assessing systematic review quality**

**6.5.1. Plaut D, Portland, Oregon and McGraw KA, Chapel Hill, North Carolina. An analysis of the reporting of search strategies in Cochrane systematic reviews.** The authors examined search strategies of 30 of 83 Cochrane reviews published in Issue 1, 2006. None of the reviews included all seven components of the search strategy description as described in the Cochrane Handbook. The authors conclude that Cochrane guidelines for reporting search strategies are not being consistently followed.

**6.5.2. Zhang W<sup>1</sup>, Moskowitz RW<sup>2</sup>, Nuki G<sup>3</sup>, Abramson S<sup>4</sup>, Altman RD<sup>5</sup>, Arden N<sup>6</sup>, Bierma-Zeinstra<sup>7</sup>, Brandt KD<sup>8</sup>, Croft P<sup>9</sup>, Doherty M<sup>1</sup>, Dougados M<sup>11</sup>, Hochberg M<sup>12</sup>, Hunter DJ<sup>13</sup>, Kwoh K<sup>14</sup>, Lohmander S<sup>16</sup>, Tugwell P<sup>17</sup> for the Osteoarthritis Research Society International (OARSI).** Nottingham, UK<sup>1</sup> Cleveland Ohio<sup>2</sup>, Edinburgh, UK<sup>3</sup>, New York, New York<sup>4</sup>, Los Angeles, California<sup>5</sup>, Southampton, UK<sup>6</sup>, Rotterdam, Netherlands<sup>7</sup>, Indianapolis, Indiana<sup>8</sup>, Keele, UK<sup>9</sup>, Paris, France<sup>11</sup>, Baltimore, Maryland<sup>12</sup>, Boston, Massachusetts<sup>13</sup>, Pittsburgh, Pennsylvania<sup>14</sup>, Lund, Sweden<sup>16</sup>, Ottawa, Ontario.<sup>17</sup> **Quality and utility of Cochrane reviews in the development of evidence-based, international consensus guidelines for the management of hip and knee osteoarthritis.** The authors compared the quality and utility of Cochrane reviews on management of hip and knee osteoarthritis with other published systematic reviews and meta-analyses. Sixty out of 282 reviews found in the literature search met the authors' inclusion and exclusion criteria. Although not all Cochrane reviews were rated as excellent, they provide useful evidence for the development of international consensus recommendations for the management of hip and knee osteoarthritis.

**6.5.3. Stevens KA,** San Antonio, Texas. **Quality of research synthesis in the nursing literature: An EPB research study.** The author described a pilot study to critically appraise the quality of systematic reviews in the nursing literature. Recommendations to improve quality included training in conducting systematic reviews, establishment of specific publication guidelines to assist reviewers and editors in making better-informed decisions to publish, and issuing notices to clinicians about the quality of systematic reviews found in the general nursing literature.

## **6.6. Assessing and incorporating study quality in systematic reviews**

**6.6.1. Abrami PC and Bernard RM,** Montreal Quebec. **Statistical control versus classification of study quality in systematic reviews.** The authors looked at various methods used to assess study quality in a systematic review. These included using methodological quality as an inclusion criterion; classifying included studies and reporting separate findings; weighting studies by methodological quality; and treating methodological quality as a predictor of effect size by removing its influence from the collection of evidence. Two regression methods were explored through a common example, treating methodological quality either as a quasi-continuous predictor or as a categorical variable with dummy coding. It was concluded that although meta-regression approaches have both advantages and drawbacks, they allow greater flexibility than treating study quality as an inclusion criterion.

**6.6.2. Treadwell JR, Tregear SJ, Reston JT,** Plymouth Meeting, Pennsylvania. **Rating the strength and stability of evidence in systematic reviews.** The authors presented a system that provides a systematic framework to incorporate judgments about study quality, the size of the evidence base, the magnitude of reported treatment effects, the consistency of findings across trials, and the robustness of these findings into the systematic review process. Ratings were assigned based

on strength and stability of evidence-based findings. Similar to the GRADE approach, this system allows for flexibility in drawing qualitative and quantitative conclusions about the efficacy of an intervention.

**6.6.3. Vaidyanathan L, Vasquez JJ, Stead LG, Rochester, Minnesota. Importance of foreign literature inclusion in systematic reviews.** The authors compared the conclusions of a Cochrane review published in 2004 using English-only articles and a subsequent review that included non-English language articles. For the topic of hyperbaric oxygen in the treatment of cerebrovascular ischemia, conclusions using the two approaches did not agree, and the authors urged that systematic reviews should be done without language limitations.

## **6.7. Case study**

**6.7.1. Vaidyanathan L, Gilmore RM, Stead LG, Rochester, Minnesota. Percutaneous clot removal devices in acute ischemic stroke: A systematic review.** The authors described methods and results of a systematic review of clot removal devices for acute ischemic stroke.

## **6.8. General meta-analytic methods**

**6.8.1. Fahrbach KR, Medford, Massachusetts. Methods for calculating empirically correct confidence intervals in meta-analysis.** The author proposed a new method of calculating confidence intervals that uses standard meta-analytic outputs rather than methods that require additional computation and customized software. The new method of confidence-interval generation was shown to provide excellent empirical coverage, even when the number of studies in the meta-analysis was small, and was equal or superior in performance to all methods previously proposed. The authors concluded that future work on confidence interval coverage should explicitly stratify by the ratio of the average population within-study variation to the population between-study variation.

## **6.9. Quality improvement in resources and services for authors**

**6.9.1. Pennick V<sup>1</sup>, Gillespie L<sup>2</sup>, Maxwell L<sup>3</sup>, A Mayhew A<sup>3</sup>, Toronto, Ontario<sup>1</sup>, York UK<sup>2</sup>, Ottawa, Ontario<sup>3</sup>. A tale of four review groups.** This poster described a survey of authors contributing to four Cochrane Review Group (CRGs) (Back; Musculoskeletal; Bone, Joint and Muscle Trauma; and Effective Practice and Organisation of Care Groups) to examine the authors' perception of the effectiveness of the "support" offered by CRGs during the development, production and maintenance of reviews. Out of 286 surveys distributed, 120 authors responded (42%). Overall, authors who responded indicated that they used the support and resources offered by Cochrane and the CRGs, and were pleased with them.

## 7. Summary of Participant Evaluations

The 141 individuals who attended the conference represented a broad range of experience and disciplines, including clinicians, researchers, policymakers, librarians and information technology specialists, consumer advocates, and funding agency representatives. Participants were asked to complete an evaluation overall and for each session attended over the 2 days of the meeting (see Appendices D and E). Overall, respondents were enthusiastic about their experience, rating most aspects of the meeting 5.00 to 3.50 on a scale where 5 = excellent, 4 = very good, 3 = good, 2 = fair, and 1 = poor. The most frequent (open ended) comment was that the meeting was informative with very good to excellent speakers. Suggestions for improvement included a better meeting room (acoustics, size and temperature), better arrangement for poster presenters, and increasing the number of interactive sessions. Overwhelmingly, comments lauded the variety and choice of topics covered during the conference.

Seventy-three evaluations were returned on Day One evaluation and 48 on Day Two. Of those responding to the question “Did the meeting meet your expectations?”, 95% (63/66) on Day One and 92.8% (39/42) on Day Two responded positively, with the remaining respondents checking “Not Certain.” Similar numbers of respondents believed that the meeting was free from commercial bias (65/66, 98% for Day One; 37/42, 88% for Day Two) .

Mean scores for each segment of the meeting are reported in Table 1. Overall, most plenary sessions scored between 5 and 4 on “Informative content” and “Objectives met.” Sessions scored less well on “Time allotted.” Mean scores for Workshops were similar, but a smaller number of surveys were completed.

**Table 1. Mean evaluation scores by session of the North American Conference on Systematic Reviews, 2006<sup>1</sup>**

Plenary sessions	Informative content	Adequate time allotted	Objectives met
	mean (n)	mean (n)	mean (n)
Mapping the landscape of what's happening in systematic reviews	3.50 (44)	3.64 (44)	3.5 (43)
Different topics, different data, different audiences: What methods are appropriate?	4.18 (57)	3.26 (57)	4.09 (56)
Post-lunch think tank: Is there a common starting point for doing a systematic review	4.10 (60)	3.69 (61)	3.97 (59)
Incorporation of systematic reviews into medical education	4.27 (56)	4.14 (56)	4.27 (55)
Panel discussion: Ethical dimensions and consequences of systematic reviews: A case study of aprotinin	4.48 (62)	4.16 (62)	4.35 (60)
Everybody's problem: Ensuring quality and defending systematic reviews	4.21 (42)	3.98 (42)	4.35 (42)
Policy and practice based on best available evidence: The role of systematic reviews: A case study of implantable defibrillators and cost	3.72 (29)	3.90 (29)	3.67 (27)
<sup>1</sup> 5 = excellent, 4 = very good, 3 = good, 2 = fair, 1 = poor			
Workshops	Informative content	Adequate time allotted	Questions answered
Introduction to systematic reviews	4.21 (29)	3.98 (29)	4.35 (29)
Improving the quality of reviews submitted for publication	3.90 (29)	3.82 (28)	3.89 (28)
Updating reviews	5.00 (2)	4.50 (2)	5.00 (2)
Drug Effectiveness Review Project	5.00 (9)	4.67 (9)	4.78 (9)

5 = excellent, 4 = very good, 3 = good, 2 = fair, 1 = poor

Participant comments generally reflected the high evaluation scores, with many positive comments (see Appendices F and G). Several themes indicated opportunities for improvement in future meetings. Participants expressed a desire for notes or copies of presentations to be made available, either online or as handouts at the meeting.

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Appendix A. Conference Program

**North American Conference on Systematic Reviews  
Encompassing Diversity in Systematic Reviews**

**Thursday, July 13, 2006**

- 7:00 - 8:00 am      **Registration and continental breakfast**
- 8:00 - 9:30 am      **Pre-conference workshop:** *Introduction to systematic reviews*  
Hannah Rothstein, PhD
- 9:30 - 9:45 am      **Welcoming remarks**  
Kay Dickersin, PhD  
Mike Busch, State of Maryland, Speaker of House of Delegates
- 9:45 - 10:30 am     **Keynote address:** *The state of systematic reviewing in North America*  
Cynthia Mulrow, MD, MSc
- 10:30 - 10:45 am    **Break**
- 10:45 - 11:30 am    **Plenary:** *Mapping the landscape of what's happening in systematic reviews*  
**Chair:** Lorne Becker, MD  
*Government supported systematic reviews*  
Jeffrey Lerner, PhD  
*Non-government supported systematic reviews*  
Jesse Berlin, ScD  
*Open discussion*
- 11:30 am - 12:30 pm **Panel:** *Different topics, different data, different audiences: What methods are appropriate?*  
**Chair:** Sally Morton, PhD  
**Panel members:**  
Randy Elder, PhD  
Michael Borenstein, PhD  
Hannah Rothstein, PhD  
Tracey Woodruff, PhD, MPH  
*Open discussion*
- 12:30 - 1:30 pm    **Lunch and concurrent poster session**
- 1:30 - 2:15 pm      **Post-lunch think tank:** *Is there a common starting point for doing a systematic review?*  
**Chair:** Dan Fox, PhD  
*Is there a standard framework? Opinion*  
Mark Helfand, MD, MS, MPH  
*Is there a standard framework? Opinion*  
Julia Littell, PhD  
*Open discussion*

## North American Conference on Systematic Reviews Program (cont'd)

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- 2:15 - 3:00 pm     **Plenary: *Incorporation of systematic reviews into medical education***  
**Chair:** Luis Gabriel Cuervo, MD  
*Graduate medical education*  
      Scott Richardson, MD  
*Undergraduate medical education*  
      Frank Domino, MD  
*Open discussion*
- 3:00 - 3:20 pm     **Break**
- 3:20 - 5:00 pm     **Panel Discussion: *Ethical dimensions and consequences of systematic reviews: A case study of aprotinin***  
**Chair and speaker:** Steve Goodman, MD, PhD  
*The (potential) role of systematic reviews in IRB oversight*  
      Jeremy Sugarman, MD, MPH, MA  
*View of journals and journal editors*  
      Trish Groves, MBBS, MRCPsych  
*View of funding agencies*  
      Jean Slutsky, PA, MSPH  
*View of policy makers*  
      Sean Tunis, MD, MSc  
*Open discussion*

### Friday, July 14, 2006

- 7:30 - 8:30 am     **Continental breakfast**
- 8:30 - 10:00 am   **Plenary: *Everybody's problem: Ensuring quality and defending systematic reviews***  
**Chair:** Karen Robinson, MSc  
*Academic recognition*  
      Kirby Lee, PharmD, MA  
*Conflicts of interest & outcomes of reviews*  
      Joel Lexchin, MD  
*Heterogeneity of the evidence*  
      Jeff Valentine, PhD  
*Quality of systematic reviews: what will it take to get a clinician to pay attention?*  
      Richard Roberts, MD, JD, FAAFP, FCLM  
*Open discussion*
- 10:00 - 10:30 am   **Break**

## North American Conference on Systematic Reviews Program (cont'd)

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- 10:30 - 12:00 noon     **Plenary:** *Everybody's problem, continued: Ensuring quality and defending systematic reviews, cont'd*  
**Chair:** Eric Bass, MD, MPH  
*Assuring quality training: is there a gold standard and if so, how do we ensure it?*  
Kay Dickersin, PhD  
*Expanding capacity: How do we get more people well-trained?*  
Virginia A. Moyer, MD, MPH  
*The elephant in the room - When important reviews are not well done*  
Susan Norris, MD, MPH, MSc  
*Attacks on systematic reviews*  
Mark Gibson  
*Open discussion*
- 12:00 - 1:00 pm     **Lunch**
- 12:00 - 3:00 pm     **Concurrent poster session**
- 1:00 - 2:30 pm     **Simultaneous Workshops**
- Workshop 1.** *Improving the quality of reviews submitted for publication*  
**Facilitators:** Steve Goodman, MD, PhD  
Cynthia Mulrow, MD, MSc
- Workshop 2.** *Updating reviews*  
**Facilitators:** Lorne Becker, MD  
Roberta Scherer, PhD
- Workshop 3.** *Drug Evaluation Review Project*  
**Facilitator:** Mark Gibson  
**Speakers:** Marian McDonagh, PharmD.  
Anthony V. Merola, RPh, MBA  
Duane Thurman
- 2:30 - 2:45 pm     **Break**
- 2:45 - 4:15 pm     **Panel discussion:** *Policy and practice based on best available evidence: The role of systematic reviews: A case study of implantable defibrillators and cost*  
**Chair:** Gil Ramirez, DrPH  
**Panel members:**  
Steve Phurrough, MD, MPA  
Naomi Aronson, PhD  
Barbara Warren, PsyD  
Gillian Sanders, PhD  
*Open discussion*
- 4:15 - 4:30 pm     **Close and evaluation**

**North American Conference on Systematic Reviews  
Encompassing Diversity in Systematic Reviews  
July 13 - 14, 2006  
Baltimore, Maryland**

**Conference Planning Committee**

**Lisa Bero, PhD**

*Co-Director, US Cochrane Center, San Francisco Branch, and Professor of Clinical Pharmacy & Health Policy, University of California, San Francisco*

**Peter Briss, MD, MPH**

*Captain, US Public Health Service, Science Officer, CCEHIP, Centers for Disease Control and Prevention*

**Kay Dickersin, PhD**

*Director, US Cochrane Center, and Director and Professor, Center for Clinical Trials, Johns Hopkins Bloomberg School of Public Health*

**Dan Fox, PhD**

*President, Milbank Memorial Fund*

**Steve Goodman, MD, PhD**

*Associate Professor, Johns Hopkins Bloomberg School of Public Health and School of Medicine*

**Joseph Lau, MD**

*Director, US Cochrane Center, Boston Branch, Institute for Clinical Research and Health Policy Studies, Tufts-New England Medical Center*

**Kelly Manos, MAS**

*Project Director, US Cochrane Center*

**Sally Morton, PhD**

*Vice President, Statistics and Epidemiology, RTI International*

**Cindy Mulrow, MD, MSc**

*Professor, University of Texas Health Science Center at San Antonio and National Program Director, Robert Wood Johnson Foundation Generalist Physician Faculty Scholars Program*

Appendix B. Conference Planning Committee

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**Hannah Rothstein, PhD**

*Professor of Management, Baruch College Zicklin School of Business and Co-Chair of the Methods Group, Campbell Collaboration*

**Roberta Scherer, PhD**

*Associate Director, US Cochrane Center, and Associate Scientist, Johns Hopkins School of Public Health*

**Jean Slutsky, PA, MSPH**

*Director, Center for Outcomes and Evidence, Agency for Healthcare Research and Quality*

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Appendix C. Invited Speakers

**Conference Invited Speakers for the  
North American Conference on Systematic Reviews  
Encompassing Diversity in Systematic Reviews  
July 13 - 14, 2006  
Baltimore, Maryland**

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Naomi Aronson, PhD. *Executive Director, Evidence-Based Practice Center at the Technology Evaluation Center for Blue Cross and Blue Shield Association*

Eric Bass, MD, MPH. *Director, Evidence-Based Practice Center, and Professor of Medicine, Johns Hopkins School of Medicine*

Lorne Becker, MD. *Emeritus Professor of Family Medicine, SUNY Upstate Medical University*

Jesse Berlin, ScD. *Unit Chief, Research Promotion and Development, Johnson & Johnson Pharmaceutical Research and Development*

Michael Borenstein, PhD. *Director, Biostat, Inc.*

Mike Busch, *State of Maryland, Speaker of House of Delegates*

Luis Gabriel Cuervo, MD, MSc. *Unit Chief, Research Promotion and Development, Pan American Health Organization*

Kay Dickersin, PhD. *Director, United States Cochrane Center, and Director and Professor, Center for Clinical Trials, Johns Hopkins Bloomberg School of Public Health*

Frank Domino, MD. *Associate Professor of Family Medicine and Community Health, University of Massachusetts Medical School*

Randy Elder, PhD. *Director, Community Guide Branch, National Center for Health Marketing, Centers for Disease Control and Prevention*

Dan Fox, PhD. *President, Milbank Memorial Foundation*

Mark Gibson. *Deputy Director, Center for Evidence-Based Policy at Oregon Health & Science University*

Steve Goodman, MD, PhD. *Associate Professor, Johns Hopkins Bloomberg School of Public Health and School of Medicine*

Trish Groves, MBBS, MRCPsych. *Deputy Editor, BMJ*

Mark Helfand, MD, MS, MPH. *Director, Oregon Evidence-based Practice Center, and Professor, School of Medicine, Division of Medical Informatics and Outcomes Research*

Kirby Lee, PharmD, MA. *Assistant Professor of Clinical Pharmacology, University of California, San Francisco and US Cochrane Center, San Francisco Branch*

Appendix C. Conference Invited Speakers (cont'd)

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Jeffrey Lerner, PhD. *President and Chief Executive Officer, ECRI*

Joel Lexchin, MD, MSc. *Associate Professor, York University School of Health Policy and Management and Emergency Department, University Health Network, University of Toronto School of Medicine*

Julia Littell, PhD. *Associate Professor, Bryn Mawr College and Campbell Collaboration*

Marian McDonagh, PharmD. *Drug Review Director, Evidence Based Practice Center, Oregon Health & Science University*

Anthony V. Merola, RPh, MBA. *Pharmacy Consultant, Pharmacy Policy and Operations Unit, Office of Medicaid Management, New York State Department of Health*

Sally Morton, PhD. *Vice President, Statistics and Epidemiology, RTI International*

Virginia A. Moyer, MD, MPH. *Professor, Center for Clinical Research and Evidence Based Medicine at the University of Texas, Houston Health Science Center*

Cynthia Mulrow, MD, MSc. *Professor, University of Texas Health Science Center at San Antonio and National Program Director, Robert Wood Johnson Foundation Generalist Physician Faculty Scholars Program*

Susan Norris, MD, MPH, MSc. *Investigator, Evidence-Based Practice Center, Oregon Health & Science University*

Steve Phurrough, MD, MPA. *Director, Coverage and Analysis Group, Centers for Medicare & Medicaid Services*

Gil Ramirez, DrPH. *Director and Professor, Urban Public Health Program, Charles R. Drew University of Medicine and Science and Cochrane Health Care of Older People Field*

Scott Richardson, MD. *Professor of Medicine, Wright State University Boonshoft School of Medicine*

Richard Roberts, MD, JD, FAAFP, FCLM. *Professor of Family Medicine, University of Wisconsin School of Medicine and Public Health*

Karen Robinson, MSc. *Deputy Director, Evidence-based Practice Center at the Johns Hopkins School of Medicine*

Hannah Rothstein, PhD. *Professor of Management, Baruch College Zicklin School of Business and Co-Chair of the Methods Group, Campbell Collaboration*

Gillian Sanders, PhD. *Associate Professor of Medicine, Duke Clinical Research Institute*

Roberta Scherer, PhD, *Associate Director, United States Cochrane Center, and Associate Scientist, Johns Hopkins Bloomberg School of Public Health*

Appendix C. Conference Invited Speakers (cont'd)

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Jean Slutsky, PA, MSPH. *Director, Center for Outcomes and Evidence, Agency for Healthcare Research and Quality*

Jeremy Sugarman, MD, MPH, MA. *Harvey M Meyerhoff Prof of Bioethics and Medicine, Phoebe R. Berman Bioethics Institute and Johns Hopkins University School of Medicine*

Duane Thurman. *Director, Prescription Drug Program, Washington Health Care Authority*

Sean Tunis, MD, MSc. *Founder and Director, Center for Medical Technology Policy*

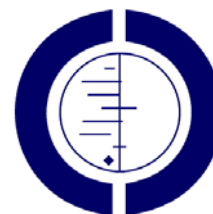
Jeffrey C. Valentine, PhD. *Assistant Professor, Duke University and Co-Chair and Editor for the Methods Group, Campbell Collaboration*

Barbara Warren, PsyD. *Director, Organizational Development, Planning & Research of the Lesbian, Gay, Bisexual & Transgender Community Center*

Tracey Woodruff, PhD, MPH. *Senior Scientist and Policy Advisor, United States Environmental Protection Agency*

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**North American Conference on Systematic Reviews  
Encompassing Diversity in Systematic Reviews**



**Program Evaluation for DAY ONE  
July 13, 2006**

**Pre-conference Workshop: Introduction to Systematic Reviews**

Objective: Provide an introduction to systematic reviews

Check here if you did not attend this session

OR Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Questions answered to satisfaction	5	4	3	2	1
Objectives were met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Hannah Rothstein	5	4	3	2	1

**Plenary I: Mapping the landscape of what's happening in systematic reviews**

Objectives: Describe types of systematic reviews being conducted in North America  
Describe uses of systematic reviews in North America

Check here if you did not attend this session

or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Questions answered to satisfaction	5	4	3	2	1
Objectives were met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Government supported systematic reviews - Jeffrey Lerner	5	4	3	2	1
Non-government supported systematic reviews - Jesse Berlin	5	4	3	2	1

## Evaluation DAY ONE, continued

**Panel Discussion:** Different topics, different data, different audiences: What methods are appropriate?  
**Objective:** Compare and contrast methods used by different groups to conduct systematic reviews

Check here if you did not attend this session   
 or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Objectives were met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Panel Chair - Sally Morton	5	4	3	2	1
Panel member - Randy Elder	5	4	3	2	1
Panel member - Michael Borenstein	5	4	3	2	1
Panel member - Hannah Rothstein	5	4	3	2	1
Panel member - Tracey Woodruff	5	4	3	2	1

**Think Tank: Is there a common starting point for doing a systematic review?**  
**Objective:** Discuss whether there should be a gold standard for methods of conducting systematic reviews

Check here if you did not attend this session   
 or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Objectives were met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Discussant - Mark Helfand	5	4	3	2	1
Discussant - Julia Littell	5	4	3	2	1

**Evaluation DAY ONE, continued**

**Plenary II: Incorporation of systematic reviews into medical education**  
**Objective:** Describe the current state of medical education with respect to systematic reviews

Check here if you did not attend this session

or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Questions answered to satisfaction	5	4	3	2	1
Objective was met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Graduate medical education - Scott Richardson	5	4	3	2	1
Undergraduate medical education - Frank Domino	5	4	3	2	1

**Panel Discussion: Ethical dimensions of systematic reviewing: Research, publication and policy - a case study of aprotinin**  
**Objective:** Discuss the ethical dimensions of proceeding with a trial without

Check here if you did not attend this session

or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Objective was met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Chair and case presentation - Steve Goodman	5	4	3	2	1
The (potential) role of systematic reviews in IRB oversight - Jeremy Sugarman	5	4	3	2	1
View of journals and journal editors - Trish Groves	5	4	3	2	1
View of funding agencies - Jean Slutsky	5	4	3	2	1
View of policy makers - Sean Tunis	5	4	3	2	1

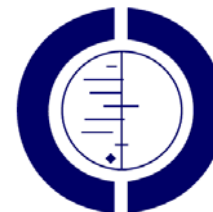
**Evaluation DAY ONE, continued**

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<b>Overall Evaluation for DAY ONE</b>
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	<b>Yes</b>	<b>No</b>	<b>Not Certain</b>
1. The program was presented without evident commercial bias or influence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The program for DAY ONE met my expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Please provide comments or suggestions: _____			
_____			
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**North American Conference on Systematic Reviews  
Encompassing Diversity in Systematic Reviews**



**Program Evaluation for DAY TWO  
July 14, 2006**

**Plenary I: Everybody's problem: Ensuring quality and defending systematic reviews**  
**Objective:** Identify issues related to quality of systematic reviews

Check here if you did not attend this session   
 or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Objective was met	5	4	3	2	1
<b>B. Quality of presentation by speaker: Session 1</b>					
Academic recognition - Kirby Lee	5	4	3	2	1
Conflicts of interest and outcomes of reviews - Joel Lexchin	5	4	3	2	1
Heterogeneity of the evidence - Jeff Valentine	5	4	3	2	1
Quality of systematic reviews: what will it take to get a clinician to pay attention? - Richard Roberts	5	4	3	2	1
<b>C. Quality of presentation by speaker: Session 2</b>					
Assuring quality training: is there a gold standard and is so, how do we achieve it? - Kay Dickersin	5	4	3	2	1
Expanding capacity: How do we get more people well-trained? - Virginia Moyer	5	4	3	2	1
The elephant in the room - when important review are not well done - Susan Norris	5	4	3	2	1
Attacks on systematic reviews - Mark Gibson	5	4	3	2	1

## Evaluation DAY TWO, continued

### Three Simultaneous Workshops

#### Workshop # 1. Improving the quality of reviews submitted for publication

Check here if you did not attend this workshop   
or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Questions were answered to satisfaction	5	4	3	2	1

#### Workshop # 2. Updating reviews

Check here if you did not attend this workshop   
or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Questions were answered to satisfaction	5	4	3	2	1

#### Workshop # 3. Drug Evaluation Review Project

Check here if you did not attend this workshop   
or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Questions were answered to satisfaction	5	4	3	2	1

**Evaluation DAY TWO, continued**

**Panel Discussion:** Policy and practice based on best available evidence. The role of systematic reviews: A case study of implantable defibrillators and cost

**Objective:** Discuss the role of systematic reviews in determining policy and clinical practice

Check here if you did not attend this session

or Circle the best answer for each item.

	Excellent	Very Good	Good	Fair	Poor
<b>A. Quality of session</b>					
Informative content	5	4	3	2	1
Adequate time allotted	5	4	3	2	1
Objectives was met	5	4	3	2	1
<b>B. Quality of presentation by speaker</b>					
Panel member - Steve Phurrough	5	4	3	2	1
Panel member - Naomi Aaronson	5	4	3	2	1
Panel member - Barbara Warren	5	4	3	2	1
Panel member - Gillian Sanders	5	4	3	2	1

**Overall Evaluation for DAY TWO**

	Yes	No	Not Certain
1. The program was presented without evident commercial bias or influence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The program for DAY TWO met my expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Please provide comments or suggestions: _____			
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