National Institute for Health Research
Cochrane-National Health Service Engagement Award Scheme

Fit for purpose: centralised updating support for high-priority Cochrane Reviews

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Abbreviations

CCT, controlled clinical trial
CEU, Cochrane Editorial Unit
CRG, Cochrane Review Group
DALY, disability adjusted life-years
DH, Department of Health
DUETs, Database of Uncertainties about the Effects of Treatments
FPR, false positive rate
HTA, Health Technology Assessment
NETSCC, NIHR Evaluation, Trials and Studies Coordinating Centre
NHS, National Health Service
NICE, National Institute for Health and Clinical Excellence
NIHR, National Institute for Health Research
NHS, National Health Service
PCT, Primary Care Trust
RevMan, Review Manager
SIGN, Scottish Intercollegiate Guidelines Network
QIPP, Quality, Innovation, Productivity and Prevention
QOF, Quality and Outcomes Framework
RCT, randomised controlled trial
ROC, receiver operating characteristic
TPR, true positive rate
UK, United Kingdom
Executive Summary

The United Kingdom (UK) is a substantial user and funder of The Cochrane Library, and it is therefore important that the priorities of National Health Service (NHS) stakeholders are taken into account. Cochrane Reviews have a deserved reputation for high quality of conduct and reporting, and authors are expected to make a commitment to maintaining their Cochrane Reviews; however, updating is a continual and ever-increasing challenge. Inevitably, Cochrane Review Groups (CRGs) need to make choices on which updates to prioritise; understanding which Cochrane Reviews are most valued by stakeholders is important for informing Cochrane prioritisation processes. Additionally, the current one-size-fits-all Cochrane guidance for updating every two years is inconsistent with (a) the marked variation between topic areas in the speed with which new research is produced, and (b) the changing landscape of advancing clinical practice. Given the workload of CRGs and authors of Cochrane Reviews, a more evidence-based approach for updating Cochrane Reviews is needed. Moreover, the important drivers and challenges for updating Cochrane Reviews are largely unknown. Identifying efficiencies in the updating process could be valuable for overcoming these barriers.

During this year-long project funded by the National Institute for Health Research (NIHR), we developed two tools for prioritising Cochrane Review updates: one for identifying Cochrane Reviews that NHS stakeholders regard as the most important to update (the NHS prioritisation tool), and one for determining whether and when to update Cochrane Reviews (the decision tool). We also piloted a centralised updating service, where we identified efficiencies for updating Cochrane Reviews, and suggested improvements in the structure and processes for a potential centralised updating service. The recommendations for The Cochrane Collaboration following this project are detailed below.

Recommendations for The Cochrane Collaboration

Prioritisation

- The Cochrane Collaboration to pilot both the NHS prioritisation tool and the decision tool with two or three different CRGs.
- The pilot to consider whether the tools are useful and time-effective for identifying priority updates, whether the tools can be used within the context of CRGs’ and The Cochrane Collaboration’s current and future prioritisation processes, whether any modifications to the tools are required, and whether the tools are broadly applicable to all CRGs.
- The pilot to involve a prioritisation meeting with members of the CRG editorial team, consumers, and other relevant stakeholders.
- An information specialist from the CRG to gather background information relevant to the prioritisation meeting, and a statistician from the CRG to run the quantitative section of the decision tool.

Updating

- The Cochrane Collaboration to consider updating search efficiencies, including MEDLINE-only searching (when appropriate), peer-review of searches, and centralised storage of search strategies.
- The Cochrane Collaboration to consider storage of all other documents relevant to an update (e.g. search results, appraisal results, completed data extraction sheets, peer-review comments, and any notes about the Cochrane Review) in Archie (The Cochrane Collaboration’s central server for managing documents and contacts details).
- Authors and CRGs to consider the following methods for increasing efficiency of updating: appraising abstracts and full-text papers in Endnote, sharing full-text papers using online file-sharing services or Archie (where licensing agreements allow), sharing translations of abstracts or trials using online-sharing services or Archie (with the copyright holder’s permission), and using structured data extraction sheets (when produced by the Cochrane Editorial Resources Committee).
- The Cochrane Collaboration to consider rolling out an updating service, offering up to 30 hours of assistance per priority Cochrane Review update. If an updating service is to be rolled out, additional funding would need to be identified and secured.

The following bullet points outline the structure and processes for an updating service if it were to be rolled out.
- The updating service to employ staff gradually to avoid wasting available resources. In the initial stages, the updating service to employ a freelance approach.
- One project manager from the updating service to oversee all updates, and one member of the updating service to be assigned to each update for point of contact with the authors, for keeping up to date with progress, and for performing the updating tasks.
- A member of the updating service to make an initial assessment of tasks to be performed during the update.
• A member of the updating service to call the authors to discuss a schedule of work to be performed by both the author team and the updating service, to highlight information relevant to the update, and to identify any documents or Archie permissions required for the update.

• A member of the updating service to compile the agreed schedule of work and send it to the authors, and the authors to sign the work schedule. If the authors are not able to sign the agreement, assistance should not be given. If authors fail to meet deadlines or are unresponsive, updating assistance to be withdrawn and offered to another update.

• The updating service to perform the following tasks: appraising abstracts and full-text papers, obtaining full-text papers and translations, inputting references into Review Manager (RevMan), extracting data (outcome, trial characteristics and risk of bias), inputting extracted data into RevMan, and creating summary of findings tables.

• The authors to perform duplicate appraisal for abstracts and papers, and duplicate data extraction (outcome, trial characteristics and risk of bias).

Dissemination of findings and continued involvement of NHS stakeholders

• The Cochrane Editorial Unit (CEU) to disseminate the results of this project through the following means: the CEU website, the CEU monthly bulletin, the Cochrane Collaboration newsletter (CCInfo), an email to all entities, the Cochrane Colloquium 2011, the Cochrane mid-year meeting 2012, and Cochrane Methods Groups.

• The Cochrane Collaboration to keep the NHS prioritisation tool up to date, for example, by ensuring that the links in the tool are current.

• CRGs to encourage external stakeholders to be involved in prioritisation meetings and to make suggestions for changes to the NHS prioritisation tool.
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Introduction

The United Kingdom (UK) is a substantial user and funder of The Cochrane Library. Cochrane Reviews underpin many of the clinical guidelines that are used by healthcare workers in the UK; for example, at the beginning of 2008, 54 guidelines from the National Institute for Health and Clinical Excellence (NICE) included citations to 572 Cochrane Reviews; 49 Scottish Intercollegiate Guidelines Network (SIGN) guidelines included citations to 271 Cochrane Reviews; and 56 clinical practice guidelines from the Royal Colleges included citations to 226 Cochrane Reviews. Usage of The Cochrane Library in the UK is also high: in 2010, Cochrane Protocols and Reviews were accessed 994,985 times, representing 25% of global use (personal communication June 2011, Gavin Stewart, Associate Editor at Wiley Blackwell). The UK Government, through the National Institute for Health Research (NIHR), funds a national licence to The Cochrane Library, and is also the largest funder of entities in The Cochrane Collaboration (personal communication July 2011, Lucie Jones, Project Support and Business Communications Officer for The Cochrane Collaboration). It is therefore important that the priorities of National Health Service (NHS) stakeholders are taken into account.

NHS stakeholders who read Cochrane Reviews need to feel confident that the information available in them is the best and most up to date in order to inform practice. Failure to keep Cochrane Reviews up to date may lead to healthcare decision-makers acting on out-of-date or potentially misleading evidence. Cochrane Reviews have a deserved reputation for high quality of conduct and reporting, and Cochrane Review authors are expected to make a commitment to maintaining their Cochrane Reviews. Updating is, however, a continual and ever-increasing challenge for Cochrane Review Groups (CRGs) in the context of a rapidly changing information environment. There are currently 52 CRGs, who work to produce Cochrane Reviews on more than 4,500 topics. While the updating record of The Cochrane Collaboration is better than other producers of systematic reviews, a search in Archie (The Cochrane Collaboration’s central server for managing documents and contacts details) in July 2011 found that more than 3000 (two-thirds) Cochrane Reviews were out of date according to Cochrane Handbook guidance that Cochrane Reviews should be updated or appropriately categorised within two years of the latest publication.

Inevitably, CRGs need to make choices on which updates to prioritise. An internal audit of CRG processes carried out in 2010 identified variation in the ways that prioritisation was achieved, in particular, the extent to which external influence was incorporated. Understanding which Cochrane Reviews are most valued by stakeholders, particularly NHS stakeholders, is required to inform Cochrane prioritisation processes.

In addition to prioritising topics relevant to stakeholders, the current one-size-fits-all Cochrane guidance for updating every two years is inconsistent with (a) the marked variation between topic areas in the speed with which new research is produced, and (b) the changing landscape of advancing clinical practice, which renders some systematic review questions obsolete, while urgently demanding updated answers to others. A recent report assessing 100 systematic reviews, published between 1995 and 2005, found that 57% of reviews required updating within five years; however, 23% of them had signals of being out of date within two years, 15% within one year, and 7% at the time of publication. Given the workload of CRGs and authors of Cochrane Reviews, a more evidence-based approach for updating Cochrane Reviews is needed to replace the current ad hoc and arbitrary approach to updating.

Once a Cochrane Review has been identified as a stakeholder priority in need of updating, the most effective means for updating is currently unknown. The important drivers and challenges for updating, beyond an understanding that Cochrane Review authors are essentially volunteers and have limited time available, need to be identified. Activities involved in updating Cochrane Reviews include carrying out the search, screening abstracts and full-text papers for potentially eligible new articles, abstracting new articles that are identified, and analysing the results. Efficiencies in these stages, including a centralised approach to some tasks, should be investigated.

The purpose of this project was therefore three-fold:

1. To identify those Cochrane Reviews that NHS stakeholders regard as the most important to update.
2. To develop a decision tool for determining whether and when to update Cochrane Reviews.
3. To explore whether selected strategies can be centralised in delivering updated Cochrane Reviews that have been identified as a priority.

The value of this project to the NHS is that stakeholders will be able to influence CRG decisions on which Cochrane Reviews need to be prioritised for updating, supporting the use of current best evidence from systematic reviews in practice. This work will be further informed by the ongoing development of tools to identify those Cochrane Reviews that are most likely to require updating in order that their conclusions can be robustly relied upon. The centralised
work packages provided to a sample of CRGs will help to deliver more updates of Cochrane Reviews, and will identify efficiencies of scale and resource use that we anticipate we will be able to roll out across The Cochrane Collaboration, resulting in more effective updating in the future.
Part 1) Identifying Cochrane Reviews that NHS stakeholders regard as the most important to update

Background

The purpose of this section of the project was to allow NHS stakeholders to influence CRG decisions on which Cochrane Reviews need to be prioritised for updating. To formalise the process by which this influence can be felt, a panel of NHS stakeholders was convened to identify the Cochrane Reviews that are the most important to update from an NHS perspective. We describe herein the panel process and the resulting draft “NHS prioritisation tool”, along with a discussion about how the tool could be modified and used during the prioritisation process within individual CRGs.

Methods

Initially it was thought that a sequential approach could be taken to integrate the three central aims of the project. This approach would have involved the NHS stakeholder panel assessing the Cochrane Reviews published by each participating CRG, coming up with a prioritised list of Cochrane Reviews for each CRG, integrating these results with the CRGs’ own priority ranking based in part on Cochrane Review instability, leading to select those Cochrane Reviews for updating in the centralised updating pilot. However, after initiation of the project, it became clear that this sequential approach was unlikely to be achievable within the timescale available, and that an alternative approach would better enable the long-term integration of NHS priorities into Cochrane updating.

In this alternative approach, instead of the NHS prioritisation panel discussing each CRG’s Cochrane Reviews and coming up with a prioritised list, the panel would focus on developing a method by which CRGs in any clinical area could identify those Cochrane Reviews which are most likely to be priorities for the NHS. This was envisaged in the form of an “NHS prioritisation tool”, which would be relatively simple to use, and could be integrated by CRGs in any clinical area into their existing processes for deciding which Cochrane Reviews to update. Given that CRGs prioritise their own Cochrane Reviews, the tool was designed to be used within CRGs rather than across CRGs.

Formation of the panel and pre-meeting questionnaire

The cross-sector NHS stakeholder prioritisation panel was intended to be made up of current end-users of Cochrane Reviews, including nominated representatives with the following roles:

- Policy-makers
- Commissioners (including Primary Care Trust (PCT) prescribers)
- NHS Knowledge service managers
- Guideline developers, NICE National Collaborating Centres
- Health Technology Assessment (HTA) and healthcare service delivery and implementation researchers
- Public health practitioners
- James Lind Alliance (an initiative that involves patients, carers, and clinicians in identifying and prioritising uncertainties about the effect of treatment)
- Clinicians (clinical research network)

Following discussion with the Cochrane Editorial Unit (CEU) regarding suitable invitees, invitations were sent out to a range of individuals. The following agreed to participate on the prioritisation panel:

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Brice</td>
<td>NHS National Knowledge Service</td>
</tr>
<tr>
<td>Anne Mackie</td>
<td>UK National Screening Committee, Imperial College Healthcare NHS Trust</td>
</tr>
<tr>
<td>Bob Coates</td>
<td>South Central PCT</td>
</tr>
<tr>
<td>Don Sinclair</td>
<td>Solutions for Public Health</td>
</tr>
<tr>
<td>Ian Bullock</td>
<td>Royal College of Physicians</td>
</tr>
<tr>
<td>Lester Firkins</td>
<td>James Lind Alliance</td>
</tr>
<tr>
<td>Mark Fenton</td>
<td>NHS Evidence and James Lind Alliance</td>
</tr>
<tr>
<td>Matthew Thalanany</td>
<td>East of England Specialised Commissioning Group</td>
</tr>
<tr>
<td>Sadru Kheraj</td>
<td>Herne Hill Group General Practice</td>
</tr>
<tr>
<td>Tom Kenny</td>
<td>NHS London</td>
</tr>
</tbody>
</table>
Although panel members were selected for their roles within the NHS, their views may not represent the views of the organisations they work for. Formal approval from individual organisations was not sought as part of the project. Dates for meetings were chosen to try to ensure maximum attendance. However, not all panel members were able to attend the panel meetings.

Before the first meeting, a pre-meeting questionnaire was sent out (see Appendix 1). The aim of the questionnaire was to start panel members thinking in terms of (a) how they would prioritise a given list of Cochrane Reviews in order of updating need, and (b) the criteria they used to formulate their prioritised list. Results from the pre-meeting questionnaire were used to help start discussions during the first meeting.

First meeting

The aim of the first meeting was to generate and then prioritise a list of criteria suitable for identifying those Cochrane Reviews that, from an NHS perspective, are high priority for updating. Full details of the meeting are given in Appendix 2. In summary, the meeting went as follows:

1. Results were presented from the questionnaire, followed by brief discussion among the panel about the differences/similarities between the lists and the suggested criteria.
2. Discussion continued with suggestions of further possible prioritisation criteria.
3. Given the amount of overlap and different types of criteria chosen, the panel were invited to briefly “tidy up” the list by suggestions for where overlapping criteria/synonyms (e.g. “cost” and “affordability”) could be merged.
4. Each member of the panel then independently scored each criterion from 1 (low) to 6 (high) depending on how important they considered the criterion to be in deciding whether a Cochrane Review should be updated.
5. Scores for individual criteria were compiled.
6. Scores for individual criteria were presented for discussion by the panel. Further discussion revolved around suitable next steps (e.g. use of Delphi process); the clustering of criteria into domains (some of them may in effect measure similar things); how to use them in a prioritisation process (e.g. use of just the highest ranking criteria, ranking by individual versus by committee); and existing research prioritisation criteria (e.g. those used by the NIHR Evaluation, Trials and Studies Coordinating Centre (NETSCC), and NICE).
7. Notes from the meeting were compiled and circulated for comment to meeting attendees and panel members who could not attend. Proposed measureable/assessable criteria were drafted based on the results of the panel’s discussion. These were distributed to the panel before the second meeting for further discussion and consideration.

Second meeting

The second meeting aimed to further develop the themes identified in the first meeting, with special reference to identifying possible specific, measurable criteria that could be used by CRGs when assessing each Cochrane Review. For example, in the first meeting “National Spend” was identified as an important criterion for assessing whether a Cochrane Review should be prioritised for updating or not. The second meeting aimed to further specify this criterion. For example, “National Spend” could refer to (among other things): 1) Spend on drug/intervention; 2) Spend on condition; 3) Spend on currently used alternative treatments. The panel were also asked to provide suggestions as to (online) resources where relevant information to judge each criterion could be found. Full details of the meeting are given in Appendix 3. In summary, the meeting went as follows:

1. Results were presented from the first meeting.
2. The panel worked their way through the list of criteria developed in the first meeting and discussed suggestions for how these criteria might be further defined and measured/assessed as outlined in Appendix 3.
3. Due to overlap between some criteria and further discussion about the importance of the various criteria, it was decided to merge or remove some criteria.
4. No scoring or ranking of these refined criteria was carried out, as it was decided that it would be a better use of time to focus discussion on ways in which criteria could be measured or assessed.
5. Discussion then revolved around how the refined criteria could be moulded into a useable scoring system that could generate a prioritised list of Cochrane Reviews. Various important points were noted:
   - It was necessary to be aware of what type of people would be doing the scoring – whether they be clinicians, researchers or editors, and whether they be joined by a representative(s) from patients groups, the NHS, or other stakeholders.
   - When using sources, websites, indices, etc. to score criteria, it could be helpful to the producers of these resources if the CRG scorers gave feedback to them about the relative usefulness of the resource.
• The NIHR have a useful “vignette” system, in which a researcher spends up to three days gathering data on, for example, spend, incidence, etc. for the topic under review, which are then provided to panel members in order to inform the prioritisation process.

• An audit trail of any prioritisation process is very important, as it allows others to repeat and/or critique the process.

• It might be helpful to have some initial, gated criteria, such as “Has any work been published on this since the last Cochrane Review?” If “No”, then there is little point in continuing the prioritisation process.

• The prioritisation scoring system could help decide not only whether a Cochrane Review requires a full update, but also whether it would be more useful, for example, to add another comparator, merge the Cochrane Review with another related topic, or split into more than one Cochrane Review.

The Proposed Draft Tool and Feedback

Based on the outcome of the first two panel meetings, a draft tool was constructed in Microsoft Excel. The results section describes the tool in more detail. The aim was for the tool to have a scoring method which would be transparent, based on easily accessible resources, and could be completed for multiple Cochrane Reviews within a reasonable timescale.

The draft tool was used to rank a sample of 19 Cochrane Reviews that had not been updated in the past two years, and therefore were in need of updating according to current Cochrane Handbook recommendations. These Cochrane Reviews came from three CRGs (Cochrane Musculoskeletal Group, 8 Cochrane Reviews; Cochrane Heart Group, 6 Cochrane Reviews; Cochrane Infectious Diseases Group, 5 Cochrane Reviews), and were selected by the CEU. The tool was used to rank these sample Cochrane Reviews in order of priority for updating.

Although initially a third meeting to test the tool and gain feedback was considered, owing to difficulties identifying dates when all panel members could attend in December 2010, and to heavy snowfall making ability to travel uncertain, the panel agreed that the final face-to-face meeting should be cancelled in favour of collecting feedback by email. Testing of the tool was carried out by Bazian, and feedback on the tool and test results were collected from the panel electronically.

The draft tool, results of the testing of the tool on the sample Cochrane Reviews, and a related questionnaire were sent to all panel members for feedback. The questionnaire addressed overall thoughts on the tool, its performance in ranking the sample Cochrane Reviews, and whether any improvements could be made (see Appendix 4).

Results and what has been accomplished

The proposed NHS prioritisation tool

A draft tool was constructed by Bazian following the prioritisation panel meetings, and further comment and feedback was gathered as described above. The tool is a Microsoft Excel file with four worksheets. The first worksheet (Figure 1) is a cover page that contains introductory text and suggestions as to how it might be used by the CRGs.

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1 Microsoft Excel file available from the authors
The second worksheet (Figure 2) consists of the main marking sheet. For each Cochrane Review under consideration, it is proposed that the CRG would ask each question on the scoring form, with each positive answer scoring a “1”, and a negative response a “0”. The final summed score for each Cochrane Review would therefore range from 0 to a maximum of 17. Each of the specific questions relates to a broader criteria area, as determined in the panel meetings: the criteria areas are: 1) Strategic Importance, 2) Patient Importance/Impact, 3) National Spend, 4) Incidence/Prevalence, and 5) Emerging Evidence/Remaining Uncertainty. Those Cochrane Reviews with the highest scores should be considered as priorities for update.

Worksheet numbers 3 and 4 (Figures 3 & 4) give descriptions and annotations of each broad criteria area and each specific question, respectively. Worksheet 4 also provides references and/or hyperlinks to further resources that can
be used to help answer the relevant question – for example, for question 1, which asks whether the Cochrane Review is about a condition that is listed on the Quality and Outcomes Framework (QOF) list, a hyperlink is provided to the relevant list of QOF Clinical Domains.

**Figure 3: Proposed tool, worksheet 3, criteria annotations**
Testing the proposed NHS prioritisation tool

The draft NHS prioritisation tool was tested by a single reviewer at Bazian on a sample of 19 Cochrane Reviews. Given that CRGs prioritise their own Cochrane Reviews, the tool was designed to be used within CRGs rather than across CRGs. Although the scores could feasibly be used to compare relative priorities between CRGs, we do not propose that it be used to do so. For example, some questions can only reasonably be answered in relation to other Cochrane Reviews in the same area being scored at the same time. Results of the test prioritisation are shown in Appendix 5, which shows the Cochrane Reviews for each of the three CRGs ranked in order of priority based on their total scores.

Three conclusions were drawn in terms of the usability of the tool as a result of the testing process:

1. There is a level of judgement when assigning scores. Therefore while the scores can be useful in terms of assigning relative levels of priority, they have to be treated cautiously, as there will always be a level of subjectivity.
2. A certain level of knowledge of the field is helpful when assigning scores. Spend, incidence/prevalence, patient impact and other criteria are often only judged in comparison to other conditions or interventions in the field.
3. As a consequence of the two observations above, it is recommended that the results of using the tool are discussed within the CRG to obtain agreement on the scoring of the individual items within the tool, with rationale behind scoring recorded. Such discussions could potentially include NHS stakeholders from outside the CRG, including patient representatives.

Feedback and Comments

Feedback and comments were received from six individuals. While feedback on the tool was broadly positive, we discuss below some of the themes that emerged from the panel’s feedback.

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**Figure 4: Proposed tool, worksheet 4, question annotations**

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<thead>
<tr>
<th>Question</th>
<th>Notes</th>
<th>Related Hyperlinks</th>
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<tr>
<td>Presence on QOF list</td>
<td>The Quality of Frameworks (QOF) consists of 66 indicators across 26 clinical areas. They are listed in response to the question “what is is QOF? What are domains?” on the QOF page listed in hyperlink section. Reviews that cover a condition in one of these clinical areas score a point.</td>
<td><a href="http://www.qof.nhs.uk/QOF_v2013.pdf">http://www.qof.nhs.uk/QOF_v2013.pdf</a></td>
</tr>
<tr>
<td>Presence on “Big 5” list</td>
<td>The Big Fifty list was prepared by the Do-Once and Share project and lists those conditions and presentations which make the biggest impact on health service resources. Reviews that cover a condition or the Big Fifty list scores a point.</td>
<td><a href="http://www.nhs.uk/DoOnce/DoOnceEvidence2007.pdf">http://www.nhs.uk/DoOnce/DoOnceEvidence2007.pdf</a></td>
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<tr>
<td>Other reasons why topic is of strategic importance</td>
<td>Reviews that cover an area considered to be strategically important for the NHS or the Do-Once should score one point.</td>
<td></td>
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<tr>
<td>Other reasons why intervention is of strategic importance</td>
<td>Reviews that cover an area considered to be strategically important for the NHS or the Do-Once should score one point.</td>
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<tr>
<td>Does review measure patient important outcomes?</td>
<td>Surrogates measures such as blood pressure or cholesterol should be considered less worthy of updating. Patients are interested in outcomes such as cardiovascular risk. Reviews measuring patient important outcomes should score one point.</td>
<td></td>
</tr>
<tr>
<td>Does intervention have a high potential impact on quality of life?</td>
<td>Interventions that are likely to bring a significant improvement in quality of life should score one point.</td>
<td></td>
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<tr>
<td>Does intervention potentially significantly lower mortality</td>
<td>Interventions that are likely to save lives should score one point.</td>
<td></td>
</tr>
<tr>
<td>High spend on condition (inc societal costs)?</td>
<td>If the condition requires a high spend, compared to others in the review group’s merit, then it should score a point. Take into account not only spend on management of the condition, but also broader societal costs.</td>
<td><a href="http://www.nbi.hpft.nhs.uk/healthinfo/global_burden_diseases/GBD_report_2004_allocation.pdf">http://www.nbi.hpft.nhs.uk/healthinfo/global_burden_diseases/GBD_report_2004_allocation.pdf</a></td>
</tr>
<tr>
<td>High spend on drug/intervention or on currently used alternative?</td>
<td>If the drug intervention, and/or the drug intervention that it potentially replaces is expensive, this should score a point here.</td>
<td></td>
</tr>
<tr>
<td>Reviews on list of 20 drugs which had the greatest number of items dispensed, OK highest net Ingredient cost in 2009 (2PL, UK)</td>
<td>Reviews on list of 20 drugs which had the greatest number of items dispensed, OK highest net Ingredient cost in 2009 (2PL, UK) should score one point.</td>
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<tr>
<td>High incidence?</td>
<td>If incidence is high compared to other conditions in the review group then it should score a point.</td>
<td></td>
</tr>
<tr>
<td>High prevalence?</td>
<td>If prevalence is high compared to other conditions in the review group then it should score a point.</td>
<td></td>
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<tr>
<td>Recent increase in incidence/prevalence?</td>
<td>If there is a trend towards an increase in incidence and/or prevalence, it should score a point here.</td>
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<tr>
<td>Current review conclusions reflect uncertainty?</td>
<td>If the current review uses terms in the conclusions such as “more evidence is required”, it should score a point here.</td>
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<tr>
<td>Significant RCTs/other eligible trials published since last update?</td>
<td>If relevant high quality trials have been published in the topic area since the last update then it should score a mark here. A simple PubMed search using, for example, the RCT filter, could be used for rapid assessment.</td>
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</table>
It was agreed that having a scoring element rather than just a list of criteria areas for discussion was useful, as it prompts users towards making a definite decision, and also makes the decision transparent and explicit. While raw scores may be overruled on the basis of broader expert judgement, they were still very useful and helped focus the mind. There was some disagreement on whether scores should be ‘weighted’ or not for different questions. Arguments for keeping a simple 0/1 unweighted system were that (a) it was simple and easy to use, and (b) because the scores were not necessarily the final factor in deciding what to prioritise for updating, the actual weighting is unimportant and that instead it is the direction of the outcome of the discussion that is critical.

From those individuals who favoured weighted scores, there were various suggestions for how the scores could be weighted. One person suggested that instead of using 0/1, it might instead be possible to have a Likert scale for each question, where the answer could be rated from 1 to 5. Another person suggested that perhaps weighting could be agreed at the beginning of each meeting, depending on the specialism of the CRG, although they were aware that weighting could be difficult to agree on and could lead to a lack of transparency. Another suggested that Cochrane Reviews should be prioritised where they scored well across a range of different criteria areas, rather than just heavily in one or two areas. Finally, it was suggested that the criteria in the area of “Emerging Evidence/Remaining Uncertainty” should be prioritised – for if these criteria are not met, others are perhaps irrelevant. For example, if no new evidence has been published since the last update, then arguably there is no point in updating the Cochrane Review, and therefore no reason to continue further along the prioritisation process.

The issue of ensuring real and meaningful patient input was one that was raised by more than one panel member. One aspect of the tool that could be developed was the insertion of questions relating to some of the work being done by UK Database of Uncertainties about the Effects of Treatments (DUETs) that aims to identify patients’ known uncertainties. A question addressing this could be added into the final section of the tool, “Emerging Evidence/Remaining Uncertainty”. It was considered that robust patient representation should be sought during all prioritisation meetings at the CRG level, and that the patient voice should be heard and allowed to “tell its story”; it was important to avoid patient-input tokenism.

The length and coverage of the tool were thought to be reasonable, and the wording of questions to be suitable. It was noted that if the tool were to be used by patient groups or non-specialists, it would be necessary to remove acronyms, such as HTAs (Health Technology Assessment), RCTs (randomised controlled trials) and DH (Department of Health), and generate a plain language version as necessary. While the tool was therefore considered generally fit for purpose, most commentators agreed that it would have to go through much user-testing in the Cochrane community. It was also suggested that it would be helpful if it could be tested more formally, by measuring inter- and intra-rater reliability, construct validity and content validity.

Discussion

How the NHS prioritisation tool could be used

It is suggested that the tool could be most appropriately used within the context of a CRG prioritisation panel meeting. We do not envisage the tool being used to prioritise the updating of Cochrane Reviews across different CRGs.

One scenario as to how the tool might be used in practice is for the information required for scoring the Cochrane Reviews that need updating to be gathered in by one or more information specialists or other researchers (e.g. information on drug spend, incidence and recent trials). This summarised information could be discussed at a CRG meeting, which would ideally involve information specialists, reviewers, clinicians, patient representatives and other topic specialists. Each Cochrane Review being considered for potential updating could be scored during the meeting, and those with the highest marks identified as priorities for updating.

Other issues relating to NHS priorities that are perhaps not captured in the scoring form may be raised and used to prioritise one or a handful of Cochrane Reviews, regardless of the scores they obtained from the scoring sheet. In such a case it is expected that the panel describe and justify their reasons for a lower-scoring Cochrane Review being prioritised.

The tool will need updating and reviewing, both in terms of capturing new strategic goals of evolving NHS policy, and in terms of ensuring that new resources are captured that could be used to score questions, and ensuring that hyperlinks in the tool are up to date. We suggest that in the first instance such updating and reviewing of the tool could occur annually.
**Future developments**

User-testing by CRGs across the Collaboration could be used to develop the tool further in order for it to become fit for purpose, including local adaptation across CRGs. There are a number of adaptations that could be made to the tool. For example:

- Using weighting scores for different questions.
- Using Likert scales rather than 0/1 for question responses.
- Adding or removing questions (particularly with reference to different needs of specialist CRGs).
- Modifying questions in order to concentrate on patient-defined outcomes.
- Having some key questions which lead to “definitely update” or “definitely do not update” decisions.
- Updating, adding-to and improving linked resources that can be used to answer questions (again, this is with particular reference to the needs of specialist CRGs).

The tool could be (a) a useful aid in making decisions, (b) an audit trail, to help increase transparency, and (c) an aid in justifying why certain prioritisation and related funding decisions were made. Of course, NHS priorities are not the only priorities that need to be considered when deciding which Cochrane Reviews are priorities for updating. Some CRGs already have in place their own systems for prioritising which Cochrane Reviews to update. How the tool for capturing NHS priorities can be integrated with other prioritisation tools in the CRGs’ prioritisation processes will need to be discussed and decided within The Cochrane Collaboration.

**Limitations of the tool and the method used to create it**

There are limitations with the tool and the process. They include the following: 1) NHS versus non-NHS priorities; and 2) difficulties with the panel process.

1. **NHS versus non-NHS priorities**: The tool reflects NHS priorities as reported by a range of NHS stakeholders, and therefore lacks an international element. The NHS serves the health needs of the UK population; The Cochrane Collaboration, on the other hand, is an international organisation whose Cochrane Reviews are used by healthcare funders and providers across the globe. Naturally, therefore, the tool may not reflect the needs and priorities of groups based outside the UK. The tool is easily adaptable, however, and we would suggest that it could be modified to reflect these concerns, or integrated into a wider prioritisation process.

2. **Difficulties with the panel process**: The panel process was successful in gathering a range of opinions from a diverse group of stakeholders. However, like any group of diverse stakeholders, consensus was at times difficult to come by. Also, the NHS is a vast and evolving institution: its priorities may change, and it may be difficult to capture all its facets based on a small sample of individuals. Nevertheless, through facilitated discussions the panel generated a strong lead towards the type of tool that would reflect NHS priorities. This information was used by Bazian to develop a pragmatic tool that met with widespread approval from panel members at the end of the process. It should be noted that although panel members were selected for their roles within the NHS, their views may not represent the views of the organisations they work for. Formal approval from individual organisations was not sought as part of the project.
Part 2) Decision tool for prioritising whether and when to update Cochrane Reviews

Background

Evidence on a particular subject or healthcare condition does not stand still. It changes and evolves as new research becomes available.\[6\] However, the decision to update a systematic review needs to be made carefully. Updating too soon may introduce bias, as there is evidence to show that trials with significant results are more likely to be completed sooner and published quicker than trials with negative or inconclusive results.\[2\] Furthermore, updating a Cochrane Review requires a significant investment in resources and doing this too soon might be an inefficient use of the already limited resources available to prepare and maintain Cochrane Reviews.

The current guidance for updating Cochrane Reviews is that this should be done every two years, but this guidance appears to be based more on the wish for findings to appear current and up to date by the end-user than evidence that this is an appropriate interval.\[8\] In reality, Cochrane Reviews in rapidly moving fields may need to be updated more often than every two years, and other Cochrane Reviews, for which the evidence is relatively stable, may require less frequent updating. A study examining the impact of updating Cochrane Reviews in 2002, found that conclusions for 9% of Cochrane Reviews were changed in the updated version of the Cochrane Review compared with the preceding version.\[9\] An analysis of data from January to December 2010 of The Cochrane Library found that the conclusions were reported to have changed in 189 of the 1062 (18%) updated Cochrane Reviews. Given the increasing workload of CRGs and Cochrane Review authors, there is a need to develop an evidence-based approach to updating Cochrane Reviews on the basis of priority rather than the current arbitrary and often unmet two years criterion.

The aim of this project was to develop and validate a decision tool to determine when Cochrane Reviews should be prioritised for updating. We have refined and amalgamated two complementary methodologies proposed for prioritising systematic review updates namely: 1) a qualitative tool based on a broad range of updating signals, including: publication of new study, information from existing studies, changes in methodology, user feedback, and clinical question;\[10\] and 2) formal statistical prediction methods that assess the impact on the inclusion of new studies and the likelihood a Cochrane Review’s conclusions will change, if updated, based on the primary or main outcome meta-analysis within the Cochrane Review.\[11\][12]

Methods

A principal task associated with developing the enhanced updating and prioritisation tool consisted of developing a prediction model to estimate the probability a Cochrane Review’s conclusions changing if the newly identified studies were to be included. The aim was to develop a prediction equation that would only include the signals from a candidate list of signals (drawn from the literature and our previous work in the area)\[11\][12] that had independent predictive ability, and to weight them to take account of different levels of importance.

The candidate list of quantitative signals is presented in Figure 5, and these were programmed in Stata (a data and analysis statistical software package) as a macro named metarank. These signals use minimal information about the new evidence (i.e. only the number of participants randomised into each arm of new studies). The macro can be applied to a collection of meta-analyses such as those of a CRG or to an individual Cochrane Review. As part of this project the existing software was also modified to allow the inclusion of meta-analyses with a continuous outcome measure such as the mean difference (previously only methods for binary outcome data were implemented).
1. Barrowman’s new participant ratio (≥ 5)
2. Evidence of small-study effects in the existing meta-analysis (p < 0.1)
3. Heterogeneity in the existing meta-analysis based on $I^2$ (> 50%)
4. Heterogeneity in the existing meta-analysis based on tau squared
5. New pivotal trial - study sample size $X$ times that of any of the previous studies (≥ 13)
6. The number of participants in a new study is greater than the number in any of the studies in the existing meta-analysis. This binary yes or no.
7. Ratio of the total number of participants (i.e. total number in both new and old trials) to the old total (≥ 1.5)
8. Number of new studies
9. Ratio of the total number of studies to the number of new studies (≥ 1.5)
10. Change in statistical significance at a specified alpha level (0.05)
11. Change in clinical significance given specified limits of clinical equivalence
12. Relative change in the magnitude of the effect (≥ 0.5 or ≥ 1.5, i.e., 50%)
13. Ratio of the total weight of the new studies to the total weight of the old studies in the updated meta-analysis (≥ 1.5)
14. Ratio of the standard error of the new effect size to that of the previous estimate (≥ 0.5)

With one exception, the signals are continuous measures to which thresholds can be applied to indicate whether or not they have been triggered. Default thresholds are shown in parentheses. For example, a threshold ≥ 1.5 represents an increase of 50%.

**Figure 5: Candidate list of quantitative signals**

The final prediction equation was derived from a best-fitting multivariable logistic regression model that was applied to a sample of updated Cochrane Reviews in which the full set of candidate signals had been evaluated using the same meta-analytic model as used by the original Cochrane Review authors. For this purpose, Cochrane Reviews flagged as updated during 2009 were identified. Owing to limited resources, a stratified sampling method was used to provide a sample of Cochrane Reviews in which the conclusions had, or had not, changed based on a new search and the inclusion of new studies. One sample consisted of all Cochrane Reviews flagged as “new search” in Issue 4, 2009 of The Cochrane Library, and the other sample consisted of all Cochrane Reviews flagged as “new search and conclusions changed” in Issues 1–4, 2009 (see Figure 6). For each Cochrane Review the following data were extracted 1) whether the conclusions of the update had changed (the outcome variable for the logistic regression); 2) the meta-analysis of the primary outcome or the main outcome of the Cochrane Review on which the conclusions of the Cochrane Review were based, and 3) the corresponding meta-analysis in the previous version of the Cochrane Review. In doing this, new trials added to the Cochrane Review in the most recent update were identified and metamrank was used to predict the impact of these “new” studies (based on only knowledge of the sample size of each new study) on each of the candidate signals.

Exploratory data analyses describing the distribution of each signal and their correlations (through appropriate numerical and graphical summaries) were conducted. Transformations were applied to signals when indicated. Ten of the 14 candidate signals were considered for the regression analyses because some signals are not always applicable. For example, Barrowman’s $n$ approach [13] is only applicable in situations where the existing meta-analysis is not statistically significant, and for the computation of tau-squared and regression tests for publication bias/small-study effects there must be at least two studies in the existing/oudated meta-analysis. Furthermore, tests for publication bias are not recommended for meta-analysis with fewer than ten studies. Also, we did not consider clinical significance because this requires knowledge of the limits of clinical equivalence (bounds set on the differences deemed practically important), which is subjective, based mainly on expert opinion.
The predictive ability of each of the ten variables was considered individually using univariate analysis. This estimates the strength of association between the conclusions changing and each signal. A criterion of \( p < 0.1 \) was used for variable selection. Multivariate logistic regression models were constructed using a stepwise selection technique to provide the optimal combination for predicting the need to update a Cochrane Review. Models were assessed using likelihood ratio tests and issues of model parsimony considered before concluding on a final model. The fit of the final model was assessed using the Hosmer-Lemeshow goodness-of-fit test. This compared the observed incidence of conclusions changing to the predicted probability from the model by quintile of predicted probability; statistically significant results indicate poor model fit. The area under the receiver operating characteristic (ROC) curve was used to evaluate the predictive accuracy of the model.

Other changes in the current version of each Cochrane Review (which might affect its conclusions) were also assessed, as required by the qualitative part of the decision tool; for example, exclusion of previously included studies, inclusion of additional data from existing studies, changes in methodology or Cochrane Review scope. Please note that cases where the conclusions changed owing to a serious error or methodological developments were excluded from our analysis, since the conclusions did not change as a result of the inclusion of additional evidence.

Following this, a user-friendly “front end” for the prediction equation was developed, and this was integrated with a modified qualitative decision tool and resulting guidance, so that one tool was created through the coherent melding of the qualitative and quantitative components.

Results and what has been accomplished

Piloting of statistical prediction tool

We identified 72 Cochrane Reviews (see Figure 6) where at least one new study had been added to the meta-analysis of the primary outcome (or the main outcome of the Cochrane Review on which the conclusions of the Cochrane Review were based) in the Issues 1–4, 2009 updated Cochrane Reviews. In six Cochrane Reviews data were not binary or continuous (log risk ratios or log hazard ratios were pooled), and in one Cochrane Review the outcome measure used was the standardised mean difference. Therefore, 65 Cochrane Reviews were included in the analysis; conclusions of the Cochrane Review changed in the updated version in 40 of the 65 Cochrane Reviews.

![Figure 6: Sample of Cochrane Reviews](image-url)

*meta-analysis of primary outcome or main outcome on which conclusions of Cochrane Review were based
Only eight of the Cochrane Reviews had a new pivotal trial based on a new study sample size ≥3 times that of any of the previous studies. Therefore, this signal was not investigated in the modelling. The six signals with p values less than 0.1 in univariate analysis were: 1) the ratio of the total weight of the new studies to the total weight of the old studies (weight ratio); 2) the ratio of the standard error of the new effect size to that of the previous estimate (standard error ratio); 3) the ratio of the total number of participants (i.e. total number in both new and old trials) to the total number in old trials (participant ratio); 4) the ratio of the total number of studies (old and new) to the total number of new studies (study ratio); 5) the number of new trials; and 6) whether or not the number of participants in a new trial was greater than the number in any of the trials in the old meta-analysis (large new trial). Some of the signals were strongly correlated, and this was taken into account in the multivariate modelling. Table 1 shows the results from the univariate and final multivariate models. The final model included the log transformed weight ratio (l_weight_ratio) and the number of new studies (N_new_trials). Internal validation performed using Jackknife cross validation techniques produced comparable estimates and standard errors. The Hosmer-Lemeshow test was not statistically significant (p=0.32) indicating good model fit. The prediction equation is:

\[
\text{logit}(p) = 0.1207 + 0.4101 \times \text{l_weight_ratio} + 0.1836 \times \text{N_new_trials}
\]

where \(\text{logit}(p)\) is the log odds and \(p\) is the probability conclusions change due to an update.

To obtain \(p\), back-transform using:

\[
\text{Probability conclusions change} = \frac{e^{\text{logit}(p)}}{1 + e^{\text{logit}(p)}}
\]

**Table 1: Univariate and multivariate odds ratios (ORs) and 95% confidence intervals (CIs) for the prediction of conclusions change in updated Cochrane Reviews**

<table>
<thead>
<tr>
<th>Signal (transformation)</th>
<th>Univariate OR (95% CI)</th>
<th>p</th>
<th>Final multivariate OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight ratio (log)</td>
<td>1.65 (1.12, 2.45)</td>
<td>0.011</td>
<td>1.51 (1.01, 2.25)</td>
<td>0.046</td>
</tr>
<tr>
<td>Standard error ratio (logit)</td>
<td>0.57 (0.37, 0.87)</td>
<td>0.009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant ratio (log)</td>
<td>4.25 (1.32, 13.62)</td>
<td>0.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study ratio (log)</td>
<td>3.89 (0.88, 17.12)</td>
<td>0.072</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of new trials</td>
<td>1.31 (0.99, 1.74)</td>
<td>0.060</td>
<td>1.20 (0.91, 1.59)</td>
<td>0.213</td>
</tr>
<tr>
<td>Large new trial</td>
<td>2.97 (1.05, 8.40)</td>
<td>0.040</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The ROC plot (Figure 7) shows the trade-off between the true positive rate (TPR; conclusions changed and classified as positive if the predicted probability was above a given threshold) and false positive rate (FPR; conclusions unchanged and classified as positive), as the threshold used for classification varies. For a threshold of 50%, the TPR was 83% and the FPR was 56%. This implies that in a hypothetical cohort of 100 Cochrane Reviews where the conclusions of 50 would change on update based on the addition of new studies to the meta-analysis of the primary outcome, nine Cochrane Reviews that should be updated would be missed and 28 Cochrane Reviews where conclusions are unlikely to change and hence of low priority would be updated. At a threshold of 50%, the FPR is high, but achieving a modest TPR at the expense of the FPR is preferable because the consequences are greater for missing a Cochrane Review in need of updating than for updating a Cochrane Review than may be of lesser priority. The area under the curve for the model was 0.72. This is the probability that a Cochrane Review in which conclusions will change when updated will rank higher than one where conclusions will not change.

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The solid square on the ROC curve represents the TPR (83%) and FPR (56%) at a threshold of 50%. The ROC curve for a model with no predictive power will lie along the straight diagonal line.

**Figure 7: ROC curve for the prediction model based on weight ratio and number of new studies**

The prediction equation was added to the metarank macro and the macro prioritises updating according to the computed probability such that the Cochrane Review with the highest probability has the highest priority for updating. Figure 8 shows the user interface that has been created to facilitate ease of use of the macro (see Appendix 6 for user guide).

**Figure 8: User interface for executing the metarank macro in Stata**

![User interface](image)

The new statistical prediction model has now been incorporated into the revised decision tool and resulting guidance. A brief outline to using the tool is provided below.

**Using the decision tool**

The decision tool (see Figure 9) provides a set of criteria that can be used to assess whether to update a Cochrane Review. The tool can be applied to a single Cochrane Review or can be used to prioritise a suite of Cochrane Reviews such as those from an individual CRG. If used to prioritise a suite of Cochrane Reviews the statistical prediction tool...
will rank the Cochrane Reviews in order of the probability that a Cochrane Review’s conclusions will change based on the inclusion of new studies. The decision tree has three steps; an assessment is required at each stage.

**Figure 9: Decision tool for prioritising whether and when to update Cochrane reviews**

1. **Is the clinical question already answered by the available evidence or is the clinical question deemed no longer relevant?**
   If it is expected that there will never be any further information that could change the findings of the Cochrane Review, the current evidence is deemed conclusive, or if it is expected that the clinical question is deemed no longer relevant, this should be discussed within the editorial team. A decision can be made to flag the Cochrane Review as “Current question; No longer being updated” or “Historical question; No longer being updated”, as appropriate. The reason for this decision should be reported in the Cochrane Review.

2. **Are there any new factors relevant to the existing Cochrane Review to consider?**
   These might include: 1) information from existing included studies, for example information about new treatment regimes, population subgroups, harms, economic data, or outcome measures, including data from ongoing studies or previously missing data; 2) new methodology, for example new statistical techniques, or changes in the Cochrane Handbook [4] or Review Manager (RevMan); 3) response to feedback from users of the Cochrane Review; 4) inclusion in policy decision-making or clinical practice guidelines, for example, it might be important to update a Cochrane Review to include in a new clinical guideline. If any such factors (termed “updating signals”) are identified, then a judgement is made on whether or not a signal for updating is likely or unlikely to change the results or conclusions of the Cochrane Review. This step will involve a degree of subjectivity and should involve all members of the Cochrane Review team and/or editorial team. The process should be briefly described to provide clarity and transparency for readers.

3. **Are there new studies?**
   If potential new studies are identified for inclusion in the meta-analysis of the primary outcome (or the main outcome of the Cochrane Review on which the conclusions of the Cochrane Review were based), then the statistical prediction tool can be applied (see Appendix 6 for user guide). The probability (given as a percentage) of this new evidence changing the results or conclusions of the Cochrane Review is calculated based on the size and number of new studies added. The results of our formal piloting showed that a threshold of 50% was sufficient to dictate the need to update the Cochrane Review.
Signal unlikely to change conclusions:
If an updating signal or new studies are identified and deemed unlikely to change the conclusions of the Cochrane Review, then the decision can be made not to update the Cochrane Review and flag it as “Current question; Considered to be up to date”. In this case, the “What’s new” section of the Cochrane Review should be updated citing any new studies, if appropriate, and why these have not been included at this time. Details of any new studies should also be added to the “Studies awaiting classification” section of the Cochrane Review. If appropriate, the description of the search methods in both the Cochrane Review’s abstract and body of the text, and the search strategies listed in the Appendix of the Cochrane Review, should be revised.

Signal likely to change conclusions:
Alternatively, if a signal or new studies are identified which are likely to change the conclusions of a Cochrane Review, and there is an author team available, the Cochrane Review should be updated as soon as possible. If a Cochrane Review team is not currently available, then the Cochrane Review should be flagged as a “Priority for updating”.

Discussion

This current project has resulted in the development of a decision tool that incorporates both quantitative and qualitative methods to guide decisions of whether, and when, to update Cochrane Reviews. Most organisations involved in the funding and production of systematic reviews recognise the importance of updating systematic reviews, although the majority have no formal policy in place for conducting such updates. Confidence in the conclusions of systematic reviews that are not regularly updated will diminish over time and may result in the withdrawal of such reviews from the public domain, as is the case with Cochrane Reviews. When applying the decision tool, it is important to recognise that there is a trade-off between the time spent checking whether to update a Cochrane Review (or suite of Cochrane Reviews) and when to update, as this is likely to reflect whether the topic area is moving at a fast or slow pace. Thus monitoring of literature should be seen as a key part of the updating process.

Shojania et al.[5] in exploring optimal approaches to updating concluded that methods for identifying systematic reviews in need of updating based on surveillance for new evidence hold more promise than relying on features of the original systematic review. Updating systematic reviews with new evidence can affect the direction, magnitude and precision of the estimate of treatment effects.9,14 Some CRGs, such as the Cochrane Infectious Diseases Group, keep literature searches up to date for each Cochrane Review they maintain, and basic details of new trials can be extracted relatively quickly from abstracts. Where regular updating of all Cochrane Reviews is not possible, clear prioritisation and timetabling could ensure that Cochrane Reviews most sensitive to change are updated regularly. A range of factors based around characteristics of the clinical problem, the nature of the evidence that is available at the time of the systematic review, the likely pattern of accumulation of further evidence in the future, the likelihood of new evidence changing recommendations and conclusions substantially, all need to be taken into account. Systematic reviews of rapidly changing topics are likely to be challenging and resource-intensive to maintain.

Prediction models are typically overoptimistic when developed, and this model will benefit from external validation in a different sample of Cochrane Reviews. Variation in the definition of what constitutes a change in conclusions across different CRGs may have affected the predictive ability of the model; we plan to explore this in more detail as some preliminary analyses indicate that the flag “updated conclusions changed” might be applied inconsistently across CRGs. Nevertheless, it is envisaged that the prediction tool will provide a means of channelling limited resources into updating Cochrane Reviews on which new evidence is likely to have the greatest impact. The software produced is flexible, allowing the use of any meta-analytic model and outcome measure commonly used in practice. Other issues external to a systematic review would need to be taken into account such as the rate at which new evidence on a topic evolves and its public health significance, and hence the synergy with the qualitative aspect of the decision tool cannot be over emphasised.

Traditionally, comments to the effect that more evidence is required are usually included at the end of a systematic review where uncertainty still exists as to the benefit of an intervention, but review authors do not provide a guide as to the amount of information required. Based on the available software, it is hoped that Cochrane Reviews will incorporate a short section towards the end that summarises the likelihood of new evidence overturning conclusions of the Cochrane Review. This will take into account ongoing studies as well as providing more explicit information with respect to further research needed, such as the number of new trials and the number of participants.

In conclusion, we anticipate that this decision tool will aid updating at the appropriate time and will minimise the need for unnecessary updating. We believe that the use of this tool could result in change from current Cochrane guidance that Cochrane Reviews should be updated every two year to a more evidence-based approach. This in turn should
lead to improvements in the quality and reliability of healthcare decisions made on the basis of current evidence. No attempt has been made in this part of the project to address criteria to establish when enough evidence has accrued on a given topic and systematic review that it is deemed decisive and not worth conducting further primary research. This issue could be investigated in a future study.
Part 3) Centralised strategies for updating Cochrane Reviews

Background

This section of the project aimed to explore whether targeted consultancy for a small number of CRGs could facilitate updating priority Cochrane Reviews, and to identify whether efficiencies could be made in the updating process.

We aimed to build upon the findings from the Updating Officer project,[15] which employed one full-time Updating Officer (two part-time experienced systematic reviewers) over one year (2007–2008) to assist in updating Cochrane Reviews. The Updating Officer project updated seven Cochrane Reviews, and each update took an average of 6.4 months to complete (range 3–11 months). The Updating Officer project reported that the main barriers to updating Cochrane Reviews were lack of familiarity with methodology, out-of-date methodology, and lack of author commitment. In the current NIHR-funded project, we aimed to provide short and focused periods of assistance, rather than assisting authors with the whole update of each Cochrane Review. This targeted work was aimed to incentivise authors, and to address some of the barriers to updating Cochrane Reviews. The intended approach was to retain both the responsibility for producing the update within the author teams, and editorial support for updates within the CRGs.

We also aimed to look specifically at identifying efficiencies and improving quality in the search for the updating process. Recent work has suggested that the search stage could be streamlined by performing MEDLINE-only searches for updating carefully selected Cochrane Reviews, and centrally storing searches, and that quality of searches could be improved by peer reviewing searches.[5][16][17][18][19] In this project we piloted these previously developed methodologies.

Methods

The project began at the beginning of July 2010. We initially approached three CRGs to be involved (Cochrane Musculoskeletal Group (July 2010), Cochrane Pain, Palliative and Supportive Care Group (September 2010), and the Cochrane Infectious Disease Group (September 2010)). A telephone call was held with each CRG to run through the purpose of the project, to discuss barriers to updating Cochrane Reviews, and to rank the importance of possible tasks that a centralised updating service could provide (see Appendix 7). We identified the following barriers to updating from a CRG perspective: authors do not have the time to work on the update; authors can find new methodology difficult; finding new author teams if the original team is not available can be challenging; insufficient editorial base resources; and fast-moving topics/fields. We also found that CRGs considered all the tasks presented to them would be valuable for updating, with some CRGs indicating that searching and appraisal of abstracts would not be as helpful as other tasks, as these tasks were already performed by the Trials Search Co-ordinators within CRGs. After consideration of the responses, and discussion among the people providing the updating service (Rachel Marshall, Toby Lasserson, Ruth Foxlee (CEU), Tamara Rader (Cochrane Musculoskeletal Group), and Alicia White (Bazian)), a final list of tasks to be offered was created (see Appendix 8). We assigned estimates for how long we thought each task would take based on previous experience, to enable us to predict how much we could achieve in the time available.

We then held a second call with the CRGs to discuss the individual Cochrane Reviews. We requested that these Cochrane Reviews were a priority for updating, as identified by the CRG’s own prioritisation processes (we did not use the prioritisation processes identified in other areas of this project, as the prioritisation section had not been completed by the time the updating phase was due to begin; see Part 1 of this report). In the call we let the groups know that we could offer them around 37 days’ of full-time assistance between November 2010 and April 2011 per CRG; we identified the tasks that we could perform; and we discussed timeframes for the updates. The number of Cochrane Reviews that the CRGs suggested for updating ranged from one to six, with nine Cochrane Reviews put forward in total. We then emailed the authors of the Cochrane Reviews, outlining the purpose of the project and offering them assistance. All authors we emailed agreed to be involved in the project.

We were unable to start working on all the Cochrane Reviews straightaway because some authors were not ready. We also did not receive as many Cochrane Reviews for updating as we had first anticipated (we had expected around six Cochrane Reviews per CRG). We therefore invited a further three CRGs to participate (Cochrane Wounds Group, Cochrane Neonatal Group and Cochrane Airways Group), and we recruited a further five Cochrane Reviews.

We worked with authors and CRGs to assign tasks to members of the updating service on a weekly basis. Submission of tasks from authors and CRGs, assigning tasks to members of the updating service, communicating with CRGs, and
keeping up to date with progress of the updates, was managed by one person (Rachel Marshall, and Giovanna Ceroni in her absence). Communication with authors was mostly through the project manager; however, other members of the updating service occasionally communicated with authors about specific queries relating to updates. We held regular conference calls between the CEU, the Cochrane Musculoskeletal Group and Bazian to keep each other informed of the status of the updates, and also other areas of the NIHR-funded project. Each person contributing to the updating service was asked to record how long each task took, so that accurate measurements from this pilot could contribute to estimating the cost of a central updating service for The Cochrane Collaboration. We took the decision not to provide a small honorarium to CRGs on delivery (as we had suggested in the project proposal), because we did not think this would be sustainable in an ongoing updating model for the Cochrane Collaboration. The updating phase was due to finish at the end of April 2011; however, we continued to work on tasks that had already been assigned, and work is still ongoing on two Cochrane Reviews (as of June 2011).

At the end of the updating period, an evaluation form was emailed to all CRGs and authors involved in the project (see Appendix 9).

**Results and what has been accomplished**

We worked on 14 Cochrane Review updates, with most updating tasks performed between November 2010 and April 2011 (six months). The mean time spent on each update was 35.5 hours (median 26.71 hours, range 4.5 to 109.75 hours). The individual tasks that were performed for each Cochrane Review, and the time taken per task, are available in Appendix 10. From this information we revised the estimates of time taken per task with the actual times taken (see Appendix 8); however, these revised estimates should be interpreted with caution, given the small sample size and the non-random selection of Cochrane Reviews. In general, we were quicker than expected at performing the search (MEDLINE-only searching), appraising abstracts, obtaining papers, and appraising papers, but took longer than expected at traditional database searching, inputting references into RevMan, extracting data (outcome, trial characteristics and risk of bias), inputting extracted data into RevMan, and creating summary of findings tables. For some tasks (assisting authors with the interpretation of results, discussion, abstract, and plain language summary; addressing peer-review comments; checking text for sense, spelling and grammar; and finding new author teams or peer-reviewers), we were not able to calculate the time taken, either because the task was not performed, or it was performed infrequently and with very variable timings.

**Status of the Cochrane Reviews in June 2011**

By June 2011, of the 14 updates we worked on, four updates had been submitted for CRG approval. Of the remaining ten updates, the text was being revised for submission to the CRG on three updates, extracted data were being inputted into RevMan for two updates, data were being extracted for two updates, abstract screening was ongoing for two updates, and we did not receive a status update for one Cochrane Review, as the author did not respond to CRG correspondence (see Appendix 10 for status of each Cochrane Review). The stage at which we started working on the Cochrane Reviews varied, but for most updates we started working from the search or abstract screening stage onwards. Given that most of the updating work was performed within six months, and members of the updating service worked on this project and other work, the progress made in the time available was good; however, some updates did not progress as quickly as we had expected because of lack of author involvement.

**Assessment of the tasks performed**

**SEARCHES**

**MEDLINE-only searches**

Before a MEDLINE-only update search could be carried out, an assessment was required to determine if this type of search was suitable. Criteria for suitability were that the previous version of the Cochrane Review had to include: at least four studies that were indexed in MEDLINE; at least 80% of participants in the studies were from MEDLINE-indexed studies; a comprehensive search had been conducted previously (at least one bibliographic database besides MEDLINE, CENTRAL/CRG specialised register, and at least one non-database method, for example, contacting authors, checking reference lists); and only randomised controlled trial (RCT) study designs. Once a Cochrane Review had been deemed appropriate for MEDLINE-only searching, a two-stage simplified search was carried out. The first stage (the Boolean search) was a MEDLINE search of the ‘condition’ and ‘intervention’, combined with the Boolean operator ‘AND’. The Boolean search was limited to the year of the previous search and publication type ‘randomized controlled trial’. The second stage was a ‘related articles’ search in PubMed. The three largest and the three newest studies from the previous version of the Cochrane Review were identified (the seed articles), located in PubMed, and then combined using the Boolean operator ‘OR’. If any of the seed articles were the same, additional studies were not identified; where there were multiple reports of one seed article, the one that appeared to be the
main report was selected; and if one of the seed articles was not indexed in PubMed, it was dropped as a seed and not replaced. A related article search was then performed, again limiting to the year of the previous search and publication type ‘randomized controlled trial’. The results from both the Boolean and related article searches were then added to a bibliographic database, duplicates were removed, and the results were sent to the authors. When we received a request for search assistance, we prospectively extracted from each Cochrane Review the MEDLINE-only searching suitability criteria (described above), the seed articles, and the search date. The extracted information was stored in a spreadsheet, which was saved centrally using Dropbox (a file-hosting service). This method is described in an Agency for Health Quality and Research review,[5] and further details about how to perform the MEDLINE-only searches are provided in Appendix 11. We received eight requests from two CRGs to perform update searches for Cochrane Reviews. The assessments to determine whether these Cochrane Reviews were suitable for a MEDLINE-only search took less than one hour each (data not shown in Appendix 10). Of the eight Cochrane Reviews assessed, three were suitable for MEDLINE-only searching; however, one of these Cochrane Reviews did not receive a MEDLINE-only search, as the CRG involved declined to participate owing to lack of experience of using this approach, and instead received a standard search. Of the two MEDLINE-only searches performed, the time taken to perform the searches was very quick when compared with the multi-database searches (2 versus 7 hours).

**Peer-review of searches and centralised storage of results**

For Cochrane Reviews that did not meet the criteria for a MEDLINE-only update, traditional multi-database update searches were performed according to Cochrane Handbook methods,[4] and four of these six traditional searches were peer-reviewed. We performed the peer review using the Peer Reviewed Electronic Search Strategy (PRESS) forum, which uses the PRESS Checklist (see Appendix 12).[20] The PRESS forum is a wiki-based online system for librarians to obtain peer review of searches, and it has received support and participation from the information science community and the Cochrane Information Retrieval Methods Group. The objective of PRESS is to help ensure the methodological quality of systematic reviews by contributing an evidence-based scale for the peer review of the electronic search strategy.[19] We peer-reviewed four searches using the PRESS forum. A note was added to the forum before the search was submitted, to ensure a peer-reviewer was available and could allocate time to return the search with comments promptly. The time taken to perform the peer review was around two hours, and comments were returned in one to two days. We did not receive recommendations from the peer-reviewers to make major changes to the searches.

**Centralised storage of searches**

Peer-reviewed searches were stored centrally in the PRESS forum, where they were accessible to the information specialists working on the updates. Central storage of this type means that authorised staff can access the search strings at the time of the scheduled update, searches can be grouped by their topic similarity, and other searches can also be consulted to improve quality of a new search. Details and documentation related to the update searches, as well as the search results, were also stored centrally in Dropbox, which facilitated easy access to the documents required by those working on the Cochrane Review update.

**Appraising abstracts and full-text papers**

We received the searches and abstracts from CRGs in either Microsoft Word or Endnote. We initially tried using Distiller (a web-based systematic review software) for the appraisal of abstracts for one update, but we abandoned this method as our experience on an unrelated project found that it would take a long time to train the authors to use the software. We then tried using spreadsheets for recording appraisal decisions, which required inputting a grid of references and selection criteria into Microsoft Excel. Creating the spreadsheets and filling them in was very time-consuming; however, the authors of the Cochrane Reviews liked receiving the appraisals in this format, as the reconciliation of duplicate appraisals was quick and simple. For searches that were received in Microsoft Word, we found that colour-coding the abstract text (blue for full-text appraisal/red for exclude) was a quicker way of recording appraisal decisions; however, the reconciliation of duplicate appraisals was slower for the author. For searches that were received in Endnote files, appraising in Endnote was the most efficient use of time. We had some problems sharing Endnote files with members of the updating team who did not have an Endnote licence but had Reference Manager software instead. In these cases we exported Endnote files into ‘RIS’ format. For appraisal of the full-text papers, we used Endnote, Microsoft Excel, or direct correspondence over email, if we were appraising only a few full-text papers. Appraising the abstracts and full-text papers was straightforward in most cases, although some authors noted that they wanted a content expert to perform the duplicate appraisal.

**Obtaining full-text papers**

Papers were obtained via subscriptions to various journals, inter-library loans, and from the British and Canadian Libraries. In one update there were several Chinese papers that were difficult to obtain, but for most updates there
were no problems obtaining papers. For papers that were not in English, we had these papers translated. We did have some difficulties sharing papers and translations between the CRGs, authors and members of the updating service. Emailing papers was difficult because of the size of attachments (even when compressed). We tried using Google docs, but noted there was a limit on the number of PDFs that could be stored. We also used Dropbox and Microsoft SkyDrive, which were both equally easy to use. Zotero (an open-source reference management software) was not an option we explored. Owing to the copyright issues of saving and storing PDFs of journal articles, we have now deleted the files from Dropbox and SkyDrive.

**INPUTTING THE SELECTED REFERENCES INTO REVMAN**

Selected references were added to RevMan with no problems. We also added some excluded references to RevMan, which took slightly longer than included references because of adding the reasons for exclusion.

**EXTRACTING DATA**

Before starting data extraction, we asked authors to send us the data extraction forms used in the previous version of the Cochrane Review. In several cases authors had not used data extraction forms in the previous version, and we therefore adapted generic data extraction sheets (e.g. the Cochrane Airways Group template data extraction form) with input from the authors. Where data extraction forms were provided by the authors, these forms were used. Members of the updating service thought that data extraction sheets could be improved if they were available in RevMan with automatic entry into the data and analyses section (once reconciled with the duplicate extractor), or if the forms exactly followed the structure of data required for adding into RevMan for easy copy and pasting. Reconciliation of duplicate data extraction was performed over email or Skype.

**INPUTTING DATA INTO REVMAN**

Inputting extracted data into RevMan was reasonably uncomplicated, except where the data extraction sheets did not match the structure required for RevMan, or if the Cochrane Review was a multi-comparison Cochrane Review and the comparisons in the study were not clear. For multi-comparison Cochrane Reviews, input from the authors was required to ensure correct data entry.

**PERFORMING THE RISK OF BIAS ASSESSMENTS**

Risk of bias assessments were performed in Microsoft Word using the template from Table 8.6a in the Cochrane Handbook. We found duplicate assessment of the risk of bias by the author (or a content expert) over email or Skype was beneficial, as they were able to make informed judgements about whether specific aspects of the study design would bias the data. On more than one occasion, when we were asked to perform risk of bias assessments for new studies, we noted that for already included studies there were sometimes no risk of bias assessments or the assessments were incomplete. In these cases we offered to perform the retrospective assessments. These instances highlighted to us that some authors might not be aware of changes in methodology or software since the last update, or were not clear on whether new methodologies should be applied retrospectively.

**ASSISTING AUTHORS WITH THE INTERPRETATION OF RESULTS AND THE DISCUSSION**

We were asked to help authors update the text of their Cochrane Review on only three occasions (data not shown for two of these Cochrane Reviews in Appendix 10; tasks still ongoing). We felt that interpretation of the analyses and writing up the discussion was a major task, which ideally should be written by someone with expert knowledge. The time required to perform this task was not easy to predict, which made allocation of resources difficult. The task was very time-consuming, and required lots of communication with the author. Given the unpredictable but likely long length of time to perform this task, and the lack of in-depth clinical knowledge within the updating service, we felt that performing this task was not necessarily the best use of time for a centralised updating service. We also felt that if authors completed this task themselves, they would maintain ownership of their Cochrane Review.

**ASSISTING AUTHORS WITH ADDRESSING PEER-REVIEW COMMENTS**

We were asked to help authors address peer-review comments on one occasion (task still ongoing). The peer-review comments were extensive, and this task (which was essentially several tasks) is still being handled by a member of the updating service. We think that addressing peer-review comments for most Cochrane Reviews would be a lengthy process, and may not be the best use of time for a centralised updating service.

**CREATING THE SUMMARY OF FINDINGS TABLES**

Summary of findings tables were drafted for authors for three Cochrane Reviews. Members of the updating service discussed with authors the outcomes they would like to include before commencing. When creating summary of
findings tables, some problems arose with respect to relevant data not being available, and the structure of the comparisons not being compatible with summary of findings tables. In these cases additional work needed to be done before the tables could be created. Although creating the summary of findings tables posed challenges, members of the updating service thought that it was a valuable service for authors who did not have experience of creating these tables or using the GRADE software.

Assessment of project management and communication with CRGs and authors

In the initial consultation with the CRGs, we discussed the time the updating service could commit, timeframes for the updates, and the aim of the project. However, some CRGs had an expectation that the updating service could work on all parts of Cochrane Reviews until publication. More clarity was needed from the updating service at the beginning and throughout the process about what the updating service aimed to offer.

In our initial email with authors, we stated that we could not take responsibility for the Cochrane Review update and that we did not expect to be listed as authors, but that we could offer assistance in performing discrete tasks. However, we did not explicitly set out the author expectations and agree a schedule of work before committing to work on the update. The commitment of authors varied considerably, from those who were unresponsive or unable to work on the Cochrane Reviews, to very enthusiastic and motivated authors. We found that motivated authors tended to be those that had already contacted their CRGs requesting assistance with their update.

The project management was handled by one person. Having one person in control of the project was beneficial in that authors and members of the updating service knew who to contact with queries, and one person was aware of the status of all the Cochrane Reviews; however, managing so many Cochrane Reviews, authors and updating members was very time-consuming (approximately 1 day per week), with extensive communication via email and Skype, and there were occasional delays in responding to author queries. We also noted that some authors may have been confused about the role of the updating service, and considered members of the updating service to be part of the CRG (e.g. we received requests for CRGs such as Archie log-in details). The communication between the project manager, CRGs and authors often went well, but a relatively common problem was that the CRG or author did not always clearly define the task, and the relevant documentation to complete the task was not always sent in the first email. We also found that we did not always receive sufficient information about changes that had been made to the Cochrane Review since the last published version, and members of the updating service had to spend time going through the Cochrane Review and its history to get up to date. Another problem was that we were sometimes asked to perform tasks, but when members of the updating service went to complete the work, they thought that other tasks needed to have been done first (e.g. completing data extraction before embarking on the summary of findings table), or some issues with the existing data needed resolving (e.g. updating incomplete risk of bias in old studies before starting on new studies).

Communication within the updating team went well, and we had regular telephone meetings to discuss the updates and any problems. An issue we did face was resource allocation. Although we attempted to maintain a consistent level of work to be completed, at some points in the project, especially in the early stages, we struggled to get authors to send us tasks or respond to tasks we had completed. Later in the project we had several weeks where we had double the number of hours requested that we could offer. We also realised that if we were asked to complete more than one task on a Cochrane Review, it would be more efficient if the same person could do both tasks on the Cochrane Review rather than involving a new person; however, it was not always possible to assign to the same person, if they had already been assigned work on another Cochrane Review.

Feedback from the CRGs and authors on the updating service

Of the 14 authors we contacted, 12 completed the evaluation form, one managing editor responded on behalf of the author to say he would not be able to complete the form as he was on holiday, and one author did not respond. Of the six managing editors we contacted, six completed the evaluation form.

For the quantitative questions in the form, the mean scores for authors were 1.6 for author motivation, 1.6 for speed of update, 1.8 for quality of update, and 1.44 for overall impression of assistance (scale of 1–5, where 1 corresponded to greatly improved and 5 corresponded to greatly worsened). The mean scores for managing editors were 1.8 for author motivation, 2.5 for speed of update, 2.75 for quality of update, and 1.5 for overall impression of assistance (same 1–5 scale). All authors and managing editors who responded to the question on rolling out an updating service for The Cochrane Collaboration were in favour of an updating service, although two managing editors did not respond. One author commented: “This is essential for keeping reviews up to date – the task is now too big for any review group and will continue to get worse if we do not look after it now”.

For the qualitative sections of the evaluation form, the responses from the authors on the service provided were mostly very positive (see Box 1).

**BOX 1: SAMPLE OF COMMENTS FROM AUTHORS**

“"The service was excellent."

""They are so accommodating – very professional and efficient. I would work with the team again, if given an opportunity to update additional reviews."

""The assistance was greatly appreciated and has really helped us progressing both reviews."

""I think it was the ongoing support, drive and motivation of the updating team. Their reading and understanding of the studies almost made me think they were burn clinicians."

"Dealing with more than two people” (in response to the question “What was the worst aspect of the assistance provided?”)

When asked about the worst aspect of the service, seven authors either did not respond, or said ‘not applicable’, or responded that there were no negative aspects. One author commented that there was sometimes a delay in answering questions, another said that they sometimes had to deal with more than two people, one author commented that they wished they had more time to contribute to the update, and one author requested further assistance with another Cochrane Review. A common theme in the comments from authors was not having enough time to contribute to updates, and feeling guilty about not keeping Cochrane Reviews up to date. Some authors did not respond to all questions, as they had received only limited assistance and did not feel able to comment. When asked about improving the service, one author suggested that the updaters should request author commitment with deadlines for completing specific tasks. Another author suggested that if authors have more than one Cochrane Review to update, it might be time efficient to work on more than one update at the same time, especially if authors have a block of protected time to work on Cochrane Reviews.

The responses from managing editors to the updating service in the qualitative sections of the evaluation form were also largely positive (see Box 2).

**BOX 2: SAMPLE OF COMMENTS FROM MANAGING EDITORS**

""I am most grateful to you all for taking one of the most time consuming parts of updating away from [the author] to allow him to concentrate on some other priority topics – it was a huge relief for me as I was beginning to worry he had too much on and that a big update on top of it all might be the straw that broke the camel’s back.”

""Assistance with risk of bias assessment (especially of included studies in the previous version) and summary of findings table. These new methods seem to be daunting to authors who have not used them previously." (In response to the question “What was the best aspect of the assistance provided?”)

""All authors were working on their update but I am certain the intervention of additional assistance resulted in the update process kick-starting.”

""There is potential for a disconnect between the review authors, the CRG, the CEU and the updater. Whilst the general communication was excellent, I did not get a sense that if the author went back to ‘silent’ mode there was anyone monitoring this to ensure the momentum was maintained. In addition in one review an included study was missed (although it was picked up by the review authors) and there is the possible danger that too many people are involved.”

Three managing editors did not feel able to comment on all qualitative sections of the form, as they had not seen the Cochrane Reviews since they had received input from the updating service. When asked about the worst aspect of the updating service, three managing editors did not respond, one said there was no negative aspect, one highlighted the potential for losing information if lots of people are involved, and a lack of follow-up with authors (see last quote in Box 2), and one thought that the process seemed overly complex to begin with. One managing editor also commented on the challenges of prioritising updates, and highlighted that the needs of CRGs may differ. When asked about improving an updating service, one managing editor commented that it would be good to tailor the service to individual CRG’s needs, and another editor suggested that there should be one project manager for each Cochrane
Review who is responsible for co-ordinating the update, and ensuring that the momentum of the update is maintained. They also suggested a detailed agreement at the start of the project concerning exactly what is proposed in terms of tasks to be undertaken, who is going to do what, and a realistic timeline.

Discussion

This pilot updating service found that targeted assistance given to committed authors can improve author motivation for updating Cochrane Reviews, and increase the speed of the updating process. Where authors are not committed to the update, assistance provided may not improve motivation or increase the speed of the update. We found that all authors and CRGs involved in the project were appreciative of the assistance provided, and most would support an updating service being rolled out across The Cochrane Collaboration.

We recommend that an updating service for The Cochrane Collaboration should offer up to 30 hours of assistance per priority Cochrane Review for updating. Clear information about what is being offered to authors would be required for a Collaboration-wide updating service. If rolled out, we recommend that the authors and a member of the updating team have a call to discuss a schedule of work to be performed by both the author team and the updating service. Ideally the member of the updating service should make an initial assessment of the Cochrane Review before the call to get an idea of the tasks that need to be performed, and assess whether any changes in methodology since the last version would affect the update; this assessment could take approximately 2–4 hours. The discussion with authors should clarify the tasks that need to be performed, and should raise any information or changes to the Cochrane Review relevant to the update (e.g. changes to the protocol since the last version was published). The discussion should also identify any documents that are required for the update, or permissions required in Archie, which should be arranged before updating begins. After the discussion the authors should be sent a written copy of the agreed tasks, which should be signed to signify commitment to the work schedule; if the authors are not able to sign the agreement, assistance should not be given. We also recommend that if authors fail to meet the deadlines agreed, or do not respond to email correspondence or telephone calls, then the updating assistance is withdrawn and offered to another priority Cochrane Review update from the same CRG.

We suggest that an updating service should perform the following tasks: appraising abstracts and full-text papers, obtaining full-text papers (including translations), inputting references into RevMan, extracting data (outcome, trial characteristics and risk of bias), inputting extracted data into RevMan, and creating summary of findings tables. We do not think that tasks such as interpretation of results, addressing peer-review comments, checking text, or finding new author teams or peer-reviewers should be performed by a centralised updating service. Members of the updating service would probably lack the clinical expertise in the Cochrane Review topic required for these tasks. The amount of time to perform the tasks is also considerable, and performing them may not be as effective as performing other tasks for motivating authors to update Cochrane Reviews. With regard to performing the search, we found that in general this was not a barrier to authors updating their Cochrane Reviews, as several CRGs already have Trials Search Co-ordinators in house to perform the search. However, some of the methods assessed in this project identified potential efficiencies in searching, although we should note that the number of searches performed in this project was low, and the results should be interpreted with caution. At present we do not recommend that a centralised updating service performs the search, but we do recommend that CRGs are encouraged to consider ways in which their searches could be made quicker and more specific, and for considering centralisation within their CRG. We note that it may be difficult to gain wide acceptance from CRGs of changes to methodology, especially if changes have not been included in the Cochrane Handbook [4]. We suggest that the Cochrane Information and Retrieval Methods Group considers these potential areas for efficiency, and makes recommendations for changes (if necessary) to the Cochrane Handbook.

During the pilot we identified several other areas where efficiencies could be made by a centralised updating service, for example, appraising abstracts and full-text papers in Endnote, sharing full-text papers and translations using online file-sharing services or Archie (if permitted by the copyright holder), and using data extraction sheets that are structured in the same way as RevMan. It should be noted that the Cochrane Editorial Resources Committee is working on a generic data extraction sheet that could be used across the Collaboration (personal communication, Miranda Cumpston, Convenor of the Editorial Resources Committee, June 2011). We also noted that for any tasks that are required in duplicate (e.g. appraising abstracts or papers, and extracting data), it was most efficient if the duplication of the task could be performed by the author wherever possible.

The pilot updating service identified challenges in managing several updates at the same time. A discussion with the authors and agreed work schedule (as outlined above) would overcome several of the challenges, such as large amounts of email correspondence. With regard to who performs the project management, we think that one person
should oversee all updates, but that each update is assigned to one member of the updating service. This member would be the sole point of contact for the author and CRG, would keep up to date with the progress, and would provide status reports to the project manager. Ideally the assigned member would also perform all the tasks for this Cochrane Review. This approach would limit the number of people involved on the update, reducing potential confusion for the author about who to contact, and reducing the risk of information being lost in communication.

With regard to documentation required for the update, although authors could email documents to the updating service at the beginning of the process, it would be most efficient if all documents relating to an update (e.g. searches, results of appraisals, papers, data extraction sheets, peer-review comments, and any notes about the review) could be stored centrally (such as Archie) and associated with a Cochrane Review version. For this storage of information to be efficient for an updating service, it would need to be adopted consistently by all CRGs. We also recommend that after a member of the updating service has finished a task, that detailed notes about this task are kept in Archie.

Regarding the cost of rolling out a centralised updating service, this would depend on how many Cochrane Reviews are to be updated. As of June 2011, there were 4622 Cochrane Reviews in The Cochrane Library. In 2010, 448 Cochrane Reviews were updated, indicating that around 20% of Cochrane Reviews are updated every two years. If we wanted to update an additional 20% of Cochrane Reviews every two years, using the model suggested of 30 hours of assistance from an updating service per update, this would cost £400,000 every year in additional funding (see Box 3). The number of Cochrane Reviews to update could be increased or decreased, based on available funding. We recommend that if an updating service were to be rolled out, staff would be employed gradually as demand increased, to avoid wasting available resources. In the initial stages a freelance approach might be most flexible.

**Box 3: Cost of Updating an Additional 920 (20%) of Cochrane Reviews Every Two Years**

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Result</th>
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<tr>
<td>20% of 4622 Cochrane Reviews = 920 to update every two years = 460 to update every year</td>
<td></td>
</tr>
<tr>
<td>460 Cochrane Reviews x 30 hours’ assistance each = 138,000 hours of updating assistance per year</td>
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<tr>
<td>138,00 hours’ assistance / 1700 hours per year per full-time employee = 8 full-time employees</td>
<td></td>
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<tr>
<td>8 full-time employees x £50,000 annual salary = £400,000</td>
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</table>
Conclusions

During this project we have developed two tools: one for identifying Cochrane Reviews that NHS stakeholders regard as the most important to update (the NHS prioritisation tool), and one for determining whether and when to update Cochrane Reviews (the decision tool). We have also identified areas where efficiencies could be made in updating Cochrane Reviews, and outlined a structure and process for a potential centralised updating service.

In developing the tools we noted some areas of overlap between them, for example, the NHS prioritisation tool includes an item “Emerging evidence/remaining uncertainty”, which is also covered in questions two and three of the decision tool. This overlap is perhaps is not surprising, given that NHS stakeholders and The Cochrane Collaboration are both likely to be interested in whether a Cochrane Review has robust and current conclusions. Although overlap between the tools has been identified, no duplication of effort should be required if CRGs choose to use both tools together. We also noted that there were some potential prioritisation issues of interest to The Cochrane Collaboration that were not covered directly by either of these two tools. For example, the number of times a Cochrane Review is accessed/cited/highlighted in the media, and issues around health equity, were not included in either tool. Both tools could be adapted to include additional items that CRGs feel are relevant to their prioritisation processes, or weighted to give some items higher priority, while still maintaining the core issues identified as relevant to NHS stakeholders.

Both tools should be tested to determine whether they are useful and time-effective for identifying priority updates, and to consider how these tools can be used within the context of CRGs’ and The Cochrane Collaboration’s current and future prioritisation processes. A pilot could be carried out with two to three CRGs that are different in terms of the number of Cochrane Reviews, scope of topic area, and number of paid staff, so that broad applicability to different CRGs can be determined. It is envisaged that the pilot would involve a prioritisation meeting per CRG, including members of the CRG editorial team, consumers, and other relevant stakeholders. The tools could be used in sequence in this prioritisation meeting, using the NHS decision tool first. As already suggested, an information specialist could gather much of the background information relevant to answering prioritisation questions before the meeting takes place. To use the quantitative aspect of the decision tool, the CRG will need access to Stata, and this section of the process should ideally be performed by a statistician.

With regard to updating, we found that limited assistance given to committed authors can improve motivation and increase the speed of the updating process; however, assistance may not improve motivation or increase the speed of updating for authors who are not able to commit any time. We recommend that a centralised updating service is rolled out, which ensures commitment of authors via a signed schedule of work before updating begins. To roll out this updating service, The Cochrane Collaboration would need to identify and secure additional funding. We also identified possible methods for improving efficiency, and these should be communicated and discussed with CRGs. There is also evidence that many CRGs already have in place effective methods for improving the rate of updating, as identified in the 2011 Cochrane Monitoring and Registration Committee reports; these methods should also be shared with other CRGs. The CEU has planned a workshop at the Madrid Colloquium to discuss areas for updating efficiency.

Dissemination and sustainability beyond the funding period

The results of this work will be disseminated widely throughout The Cochrane Collaboration. Initially, we intend to post this report on the CEU website, and highlight it through the CEU monthly bulletin, the Cochrane Collaboration newsletter (CCInfo), and in an email to all entities within The Cochrane Collaboration. The results of this project will also be reported at the Cochrane Colloquium 2011 in Madrid, in a workshop on updating, and in an abstract on the decision tool. At the 2012 Cochrane Collaboration mid-year meeting in Paris, the CEU will hold a strategic session on Cochrane content. We intend to make recommendations for The Cochrane Collaboration on a variety of issues, including prioritisation and updating; on these issues we will draw largely on the findings of this project, and the work conducted in the intervening period. The CEU will also work with the relevant Cochrane Methods Groups to highlight the results of this project.

The NHS engagement aspect of this project has involved the development of a tool, and therefore the influence of the NHS engagement will affect prioritisation processes for as long as the tool is used. We intend to keep the tool up to date, for example, by ensuring that the links in the tool are current. It is also hoped that CRGs will involve external stakeholders, for example, NHS stakeholders, in their prioritisation meetings. During these meetings, stakeholders should be encouraged to suggest changes to the tool.

Recommendations for The Cochrane Collaboration
Prioritisation

- The Cochrane Collaboration to pilot both [the NHS prioritisation tool](#) and [the decision tool](#) with two or three different CRGs.
- The pilot to consider whether the tools are useful and time-effective for identifying priority updates, whether the tools can be used within the context of CRGs' and The Cochrane Collaboration's current and future prioritisation processes, whether any modifications to the tools are required, and whether the tools are broadly applicable to all CRGs.
- The pilot to involve a prioritisation meeting with members of the CRG editorial team, consumers, and other relevant stakeholders.
- An information specialist from the CRG to gather background information relevant to the prioritisation meeting, and a statistician from the CRG to run the quantitative section of the decision tool.

Updating

- The Cochrane Collaboration to consider updating search efficiencies, including MEDLINE-only searching (when appropriate), peer-review of searches, and centralised storage of search strategies.
- The Cochrane Collaboration to consider storage of all other documents relevant to an update (e.g. search results, appraisal results, completed data extraction sheets, peer-review comments, and any notes about the Cochrane Review) in Archie.
- Authors and CRGs to consider the following methods for increasing efficiency of updating: appraising abstracts and full-text papers in Endnote, sharing full-text papers using online file-sharing services or Archie (where licensing agreements allow), sharing translations of abstracts or trials using online-sharing services or Archie (with the copyright holder’s permission), and using structured data extraction sheets (when produced by the Cochrane Editorial Resources Committee).
- The Cochrane Collaboration to consider rolling out an updating service, offering up to 30 hours of assistance per priority Cochrane Review update. If an updating service is to be rolled out, additional funding would need to be identified and secured.

The following bullet points outline the structure and processes for an updating service if it were to be rolled out.

- The updating service to employ staff gradually to avoid wasting available resources. In the initial stages, the updating service to employ a freelance approach.
- One project manager from the updating service to oversee all updates, and one member of the updating service to be assigned to each update for point of contact with the authors, for keeping up to date with progress, and for performing the updating tasks.
- A member of the updating service to make an initial assessment of tasks to be performed during the update.
- A member of the updating service to call the authors to discuss a schedule of work to be performed by both the author team and the updating service, to highlight information relevant to the update, and to identify any documents or Archie permissions required for the update.
- A member of the updating service to compile the agreed schedule of work and send it to the authors, and the authors to sign the work schedule. If the authors are not able to sign the agreement, assistance should not be given. If authors fail to meet deadlines or are unresponsive, updating assistance to be withdrawn and offered to another update.
- The updating service to perform the following tasks: appraising abstracts and full-text papers, obtaining full-text papers and translations, inputting references into RevMan, extracting data (outcome, trial characteristics and risk of bias), inputting extracted data into RevMan, and creating summary of findings tables.
- The authors to perform duplicate appraisal for abstracts and papers, and duplicate data extraction (outcome, trial characteristics and risk of bias).

Dissemination of findings and continued involvement of NHS stakeholders

- The CEU to disseminate the results of this project through the following means: the CEU website, the CEU monthly bulletin, the Cochrane Collaboration newsletter (CCInfo), an email to all entities, the Cochrane Colloquium 2011, the Cochrane mid-year meeting 2012, and Cochrane Methods Groups.
- The Cochrane Collaboration to keep the NHS prioritisation tool up to date, for example, by ensuring that the links in the tool are current.
- CRGs to encourage external stakeholders to be involved in prioritisation meetings and to make suggestions for changes to the NHS prioritisation tool.
Appendices

Appendices to Part I

Appendix 1: Pre-meeting questionnaire

Below is the questionnaire sent to panel members to be completed and returned in advance of the first panel meeting.

ABOUT YOU

Name:

Role title:

Which category(ies) do you belong to (delete those that do not apply):

- Policy-maker
- Commissioner
- PCT prescriber
- NHS Knowledge service manager
- Guideline developer, NICE National Collaborating Centres
- HTA and healthcare service delivery and implementation researcher
- Public health practitioner
- Clinician (clinical research network)
- Consumer/patient or patient group representative
- Other (please specify)

Please list your clinical specialty/special interest area(s) (e.g. cardiovascular, neurology etc):

ABOUT YOUR COCHRANE USAGE

1. Do you use/have you used Cochrane Reviews? (Yes/No, delete as appropriate)
2. If you answered NO to Q1, what are the reasons why you don’t use them?

If you answered YES to Q1 please answer the following questions:

3. Which Cochrane Reviews do you use? (broad categories e.g. “musculoskeletal reviews” are fine rather than a list)
4. What do you use the Cochrane Reviews for?
5. How often do you use the Cochrane Reviews?
6. Which Cochrane Reviews are the most useful/important to you?
7. Why are these Cochrane Reviews the most useful/important to you?
8. Are there any Cochrane Reviews which you have used which you think need updating, and if so which one(s)?
9. If you answered YES to Q8, why do you think these Cochrane Reviews need updating?

PRIORITISATION EXERCISE

We would like you to complete a short prioritisation exercise to start you thinking about prioritising Cochrane Reviews for updating. Below is a list of eight Cochrane Reviews which we would like you to prioritise for updating (abstracts for these Cochrane Reviews are provided on the next page). In the table provided we would like you to rank these Cochrane Reviews from 1 to 8 in order of how important they would be to update from your perspective, with number 1 being the most important and 8 the least important. We would also like you to note what factors you considered in making your decisions. There are no correct answers to this exercise, it is simply meant to start you thinking about what factors would be important to you in deciding which Cochrane Reviews were most important to update.

- Omega 3 fatty acid for the prevention of dementia (search date 2005)
- Cognitive behaviour therapy for chronic fatigue syndrome in adults (search date 2005)
- Rituximab as maintenance therapy for patients with follicular lymphoma (search date 2007)
- Acupuncture for shoulder pain (search date 2003)
- Combined inhaled anticholinergics and beta2-agonists for initial treatment of acute asthma in children (search date 2000)
- Rosiglitazone for type 2 diabetes mellitus (search date 2007)
- Carotid endarterectomy for carotid stenosis in patients selected for coronary artery bypass graft surgery (search date 2008)
- Screening for prostate cancer (search date 2005)

[Abstracts for the Cochrane Reviews were provided, but are not reproduced here]

**Appendix 2: Full report of the first NHS Engagement Prioritisation Meeting (6 September 2010)**

<table>
<thead>
<tr>
<th>TABLE 2: ATTENDEES TO THE FIRST MEETING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Mark Fenton</td>
</tr>
<tr>
<td>Don Sinclair</td>
</tr>
<tr>
<td>Ian Bullock</td>
</tr>
<tr>
<td>Bob Coates</td>
</tr>
<tr>
<td>David Tovey</td>
</tr>
<tr>
<td>Alan Lovell</td>
</tr>
<tr>
<td>Alicia White</td>
</tr>
<tr>
<td>Vivek Muthu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 3: APOLOGIES TO THE FIRST MEETING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Anne Brice</td>
</tr>
<tr>
<td>Anne Mackie</td>
</tr>
<tr>
<td>Lester Firkins</td>
</tr>
<tr>
<td>Tom Kenny</td>
</tr>
<tr>
<td>Matthew Thalanany</td>
</tr>
<tr>
<td>Sadru Kheraj</td>
</tr>
</tbody>
</table>

**Pre-meeting Exercise**

All panel members (attendees and non-attendees of the first meeting) were sent the meeting agenda and the pre-meeting questionnaire (see Appendix 1) before the first meeting. Results of the questionnaire can be seen below. Responses to the prioritisation exercise (Table 4) were used to initiate the first part of the discussion in the first meeting – brainstorming a list of criteria.

**Outline of proceedings**

- Participants introduced themselves and the facilitator (Alan Lovell) explained the structure of the meeting.
- David Tovey gave an introduction to Cochrane and the project. Attendees asked questions, including about the funding of The Cochrane Collaboration in the UK, which is largely from the Department of Health (DH).
- Alicia White presented results from the online questionnaire, followed by brief discussion among the panel about the differences/similarities between the lists and the suggested criteria.
- Discussion continued with suggestions of further possible prioritisation criteria noted. The full list at the end of this section is shown below.
- Given the amount of overlap and different types of criteria chosen, the panel were invited to briefly “tidy up” the list by suggestions for where overlapping criteria/synonyms (e.g. “cost” and “affordability”) could be merged. The tidied-up list is shown below (Table 5), along with explanations.
- The tidied-up list was used to populate the Criteria Scoring Form detailed below (Table 6). Each member of the panel then independently scored each criterion from 1 (low) to 6 (high), depending on how important they consider the criterion to be in deciding whether a Cochrane Review should be updated.
- Scores for individual criteria were then compiled and presented for discussion by the panel. Further discussion revolved around suitable next steps (e.g. use of Delphi process); the clustering of criteria into domains (some of them may in effect measure similar things); how to use them in a prioritisation process (e.g. use of just the highest ranking criteria, ranking by individual versus by committee); and existing research prioritisation criteria (e.g. those used by the NETSCC and NICE).
- Finally there was a meeting round-up and discussion of suitable course for the following two meetings.

**Questionnaire responses**
Six respondents submitted responses to the questionnaire, although only five responses were received for each question. All five participants reported having used Cochrane Reviews, 40% (two respondents) reported using Cochrane Reviews every couple of months, with one participant reporting using them daily, one reporting weekly use, and one monthly use.

Six responses were received, and the vote tallies were as shown in Table 4 (with Cochrane Reviews ordered according to priority for updating, with highest priority Cochrane Reviews at the top and lowest priority Cochrane Reviews at the bottom of the table).

**Table 4: Results of the prioritisation exercise**

<table>
<thead>
<tr>
<th>Cochrane Review</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Responses</th>
<th>Average ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rituximab as maintenance therapy for patients with follicular lymphoma</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Combined inhaled anticholinergics and beta2-agonists for initial treatment of acute asthma in children</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Rosiglitazone for type 2 diabetes mellitus</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>Screening for prostate cancer</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>3.7</td>
</tr>
<tr>
<td>Omega 3 fatty acid for the prevention of dementia</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>5.4</td>
</tr>
<tr>
<td>Carotid endarterectomy for carotid stenosis in patients selected for coronary artery bypass graft surgery</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>Cognitive behaviour therapy for chronic fatigue syndrome in adults</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>5.7</td>
</tr>
<tr>
<td>Acupuncture for shoulder pain</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>5.7</td>
</tr>
<tr>
<td>Responses</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Initial brainstorm list of criteria**

Participants were asked to list any factors that they took into account in ranking the Cochrane Reviews in the questionnaire. Factors listed were presented at the start of the criteria brainstorming session in the first meeting to stimulate discussion.

Criteria are listed in no particular order

- Search date
- Remaining uncertainty in the Cochrane Review
- Ongoing study(ies) on the topic
- Number of studies published since search date
- How common a reason for consultation (e.g. with a GP)
- Importance to patients and clinicians
- Burden of disease in the UK
- Cost
- Likelihood of new evidence demonstrating whether there is a clinical benefit for the treatment, or if it is cost-effective
- Pressure to provide intervention despite poor evidence of clinical effectiveness
- Definitiveness of conclusions
- NICE have/have not reviewed existing policy
- Large volume of interventions – therefore high cost
- Information already available to guide policy (e.g. disinvestment)
- Relevance for guideline development
- Health problem
- Known uncertainties/degree of uncertainty
- Size of problem
- Need to plan primary research
- Government priorities
- Clinical variation
- Inequalities (e.g. ethnicity, learning difficulties, etc.)
- NICE quality standards programme
- Likelihood of dropping out of use (e.g. rosiglitazone likely to be banned/discontinued)
- Effectiveness
• Safety
• Patient experience
• Possibility of feeding results into appropriate places (e.g. HTA, safety reporting)
• “Done to death” – Evidence saturation (flip-side that new evidence will affect conclusion)
• Absence of evidence
• Clinical versus statistical significance
• Direct or indirect evidence applications (e.g. acupuncture could be used for different conditions but a single drug may not)
• Population need
• Is it the right question?
• Does the topic matter now?

**Table 5: Tidied brainstorm list of criteria**

*Criteria are listed in no particular order*

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Comments/definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence/prevalence</td>
<td>The national incidence or prevalence (whichever is more appropriate) of the condition. More common conditions would be given precedence over less common conditions</td>
</tr>
<tr>
<td>National Spend</td>
<td>Spend on the drug, intervention or condition, whichever is more appropriate. Drugs/interventions/conditions with high spends would be given precedence over Drugs/interventions/conditions with low spends</td>
</tr>
<tr>
<td>Patient importance/impact</td>
<td>How much impact the condition has on the patient’s quality of life. Conditions with major impact on quality of life could be prioritised over conditions with less impact on quality of life</td>
</tr>
<tr>
<td>Remaining uncertainty in the Cochrane Review</td>
<td>Whether the Cochrane Review has been able to come to robust conclusions regarding the questions it posed. Cochrane Reviews with less robust conclusions would be given precedence over those with more robust conclusions. For example, this could be measured by number of studies in the Cochrane Review, number of participants, or confidence intervals in the previous meta-analysis</td>
</tr>
<tr>
<td>Emerging evidence (ongoing/completed trials)</td>
<td>What new evidence has become available since the last update? For example, updates should be a priority in areas where new, high-quality evidence (e.g. large RCTs) has recently become available</td>
</tr>
<tr>
<td>Inequalities (impact of intervention thereon)</td>
<td>Whether the intervention might reduce health inequalities. For example, interventions targeting populations, communities or individuals with unequal access to care or poorer outcomes would be given precedence over those which are not expected to have an impact on health inequalities</td>
</tr>
<tr>
<td>Speed of evolution of field</td>
<td>How rapidly innovations are being introduced in the field and/or how rapidly the body of research evidence on the topic is changing. Cochrane Reviews would be given precedence for more frequent updating if they are in fields where new interventions, drugs, procedures or devices are rapidly coming onto the market, or where many research papers were being published</td>
</tr>
<tr>
<td>Potential clinical impact/disruptive technology</td>
<td>Whether the intervention has the potential to cause changes/be disruptive to normal NHS clinical practice. Cochrane Reviews would be given priority for updating where interventions they cover have the potential to be disruptive</td>
</tr>
<tr>
<td>Variation in practice</td>
<td>Whether clinical practice in the area covered by the Cochrane Review shows variability. Cochrane Reviews could be prioritised when they cover a technology or condition that has variable application in practice</td>
</tr>
<tr>
<td>Quality of existing evidence base</td>
<td>Number, methodological quality, and size of studies already included in the Cochrane Review. For example, Cochrane Reviews would be a lower priority if they already include a number of large, high-quality RCTs</td>
</tr>
<tr>
<td>Already covered by NICE/other HTA/guideline</td>
<td>Whether a Cochrane Review topic has been covered more recently by NICE or other reliable guideline/HTA group. If the topic has been covered it would be considered a lower priority for updating</td>
</tr>
<tr>
<td>Strategic importance</td>
<td>Strategic importance of the condition/intervention to the DH or the NHS. Cochrane Reviews in areas considered to be of high strategic importance would be given higher priority</td>
</tr>
</tbody>
</table>

**Criteria scoring form**

Participants were asked to complete the following scoring form to indicate how important each criterion would be to the NHS in determining the priority of a Cochrane Review for updating. **Table 6** below indicates the average score obtained for each criterion.

**Table 6: Criteria scoring form**

<table>
<thead>
<tr>
<th>Item</th>
<th>Criteria</th>
<th>Average score (1 low, 6 high)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Incidence/prevalence</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>National Spend</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patient importance/impact</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---------------------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Remaining uncertainty in the Cochrane Review</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Emerging evidence (ongoing/completed trials)</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Inequalities (impact of intervention thereon)</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Speed of evolution of field</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Potential clinical impact/disruptive technology</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Variation in practice</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Quality of existing evidence base</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Already covered by NICE/other HTA/guideline</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Strategic importance</td>
<td>5.5</td>
<td></td>
</tr>
</tbody>
</table>

### Appendix 3: Full report of the second NHS Engagement Prioritisation Meeting (21 September 2010)

**Table 7: Attendees to the second meeting**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Fenton</td>
<td>NHS Evidence and James Lind Alliance</td>
</tr>
<tr>
<td>Ian Bullock</td>
<td>Royal College of Physicians</td>
</tr>
<tr>
<td>Bob Coates</td>
<td>South Central PCT, NHS Southampton City</td>
</tr>
<tr>
<td>Anne Brice</td>
<td>NHS National Knowledge Service</td>
</tr>
<tr>
<td>Alan Lovell</td>
<td>Bazian</td>
</tr>
<tr>
<td>Alicia White</td>
<td>Bazian</td>
</tr>
<tr>
<td>Vivek Muthu</td>
<td>Bazian</td>
</tr>
</tbody>
</table>

**Table 8: Apologies to the second meeting**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don Sinclair</td>
<td>Solutions for Public Health, NHS Milton Keynes</td>
</tr>
<tr>
<td>Anne Mackie</td>
<td>UK National Screening Committee, Imperial College Healthcare NHS Trust</td>
</tr>
<tr>
<td>Lester Firkins</td>
<td>James Lind Alliance</td>
</tr>
<tr>
<td>Tom Kenny</td>
<td>NHS London</td>
</tr>
<tr>
<td>Matthew Thalanany</td>
<td>East of England Specialised Commissioning Group</td>
</tr>
<tr>
<td>Sadru Kheraj</td>
<td>Herne Hill Group General Practice</td>
</tr>
</tbody>
</table>

**Outline of proceedings**

- Participants introduce themselves and facilitator (Alicia White) explained the structure of the meeting.
- Facilitator presented results from the first meeting, along with an introduction to the proposed format for the second meeting.
- The panel worked their way through the list of criteria and the suggestions for measureable/assessable criteria as outlined below. **Table 9** notes the key themes that emerged from discussions around each criterion.
- No scoring or ranking of criteria was carried out, as it was felt that such a process would be unhelpful given the current stage of the process. It was instead decided that it would be more helpful to focus discussion on ways in which criteria could be measured or assessed.
- It was decided to merge or remove some criteria. The resulting refined list of criteria is shown below (**Table 10**).
- Discussion then revolved around how we could begin to think about moulding the criteria into a useable scoring system. It was noted:
  - It is necessary to be aware of what type of people would be doing the scoring – whether they be clinicians, researchers or editors, and whether they be joined by a representative(s) from patients groups, the NHS, or other stakeholders.
  - When using sources, websites, indices, etc. to try to score certain criteria, it would be helpful to the producers of said resources if the CRG scorers gave feedback to them about the relative usefulness of the resource.
  - The NIHR have a useful “vignette” system, in which a researcher spends up to three days gathering data on, for example, spend, incidence, etc. for the condition under review to inform the prioritisation process.
  - An audit trail of any prioritisation process is very important, as it allows others to repeat and/or critique the process.
  - It might be helpful to have some initial, gated criteria, such as “Has any work been published on this since the last Cochrane Review?” If “No”, then there is little point in continuing the prioritisation process.
The prioritisation scoring system could help decide not only whether a Cochrane Review requires a full update, but also whether it would be more useful, for example, to merge the Cochrane Review with another related topic, or split into more than one Cochrane Review.

Finally there was a meeting round-up and discussion of suitable course for the final meeting in December 2010.

**Discussion on Criteria**

The panel discussed each criterion from the first meeting in turn and offered suggestions on their relative importance and how they might best be assessed or measured. Table 9 below records the main points that were made for each criterion.

**Table 9: Comments on criterion**

<table>
<thead>
<tr>
<th>Criteria from 1st meeting</th>
<th>Average 1st round score (1 low, 6 high)</th>
<th>Comments from the Panel on how each criterion might be assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic importance</td>
<td>5.5</td>
<td>DH website</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Top 60” conditions – Burden of Disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NICE are talking of generating a “top 150” conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to do now as DH in middle of re-organisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>As any tool designed is likely to be an intra-group tool, this criterion might not helpful? e.g. “cardiovascular disease” might be an area of strategic importance but this might cover all the Cochrane Reviews done by the Cochrane Heart Group “Quality standards”? “National quality board”?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e.g. does it appear on two or more of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. NHS Commissioning board (not yet in existence)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. National quality board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. QOF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. National Public Health Service/Health Protection Agency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. National Screening Committees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. DH National Programmes of Delivery or work programmes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Quality, Innovation, Productivity and Prevention (QIPP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Synergy e.g. NICE reviews are coming up therefore SRs would be useful. Ask NICE/SIGN what are coming up...</td>
</tr>
</tbody>
</table>

| Patient importance/Impact | 5.3 | Depending on how this criterion is defined, WHO average disability weights (i.e. Global Burden of Disease) may not be very suitable for this purpose, i.e. if we are referring to patient-rated importance of a condition, etc. Disability Adjusted Life Years (DALYs) could be used to contribute to the overall assessment of the burden of the disease. Include aspirational note in final report (e.g. including suggestions to include patient important outcomes in the Cochrane Reviews themselves) Generally though, there are not simple resources available to assess patient importance |

| National Spend           | 5.3 | 1. Spend on drug/intervention (£ per year in the NHS) |
|                         |     | 2. Spend on condition (£ per year in the NHS)         |
|                         |     | 3. Spend on currently used alternative interventions (£ per year in the NHS) |
|                         |     | 4. Societal costs?                                    |
|                         |     | The information can be sourced from searches of e.g.  |
|                         |     | PubMed Search                                        |
|                         |     | Guidelines                                            |
|                         |     | NHS prescription cost analysis                        |

| Incidence/prevalence     | 4.9 | 1. Incidence (x cases per y of population per z time) |
|                         |     | 2. Prevalence (x cases per y of population)           |
|                         |     | 3. Change of incidence/prevalence over time         |
|                         |     | The information can be sourced from searches of e.g.  |
|                         |     | PubMed Search                                        |
|                         |     | Websites such as “wrong diagnosis”                   |
|                         |     | Guidelines                                            |

| Variation in practice    | 4.4 | Is this important enough on its own to be a criterion? Relationship to other criteria? It may relate to uncertainty in the evidence base, but may alternatively represent poor implementation of a robust evidence base. An impractical criterion? UK DUETs? |
Emerging evidence (ongoing/ completed trials)  4.3  1. Number of RCTs published since Cochrane Review (e.g. tagged as such in MEDLINE)  
2. Number of RCTs published since Cochrane Review with an (e.g.) N>50  
3. Safety profiles/concerns  
4. Trial registers. Cochrane should list ongoing trials in each Cochrane Review, so can look to see if they have “gone live” since last Cochrane Review  
Safety/efficacy comes before cost-effectiveness  
Useful go/no go criteria (perhaps after strategic importance) – if there is nothing new, no point updating Cochrane Review (regardless of importance in other areas)  
Must include reviews outside of Cochrane  
DARE  
Can get information from:  
CRGs’ own trial registers (first port of call)  
WHO database  
NHS Evidence  
PubMed

Potential clinical impact/ disruptive technology  4.1  To judge this criterion it would be really important to have a clinician in the field available for discussion at the review stage  
1. Judgement call? Yes/No  
2. Need for new equipment etc. Impact not only on clinical practice but also commissioning impact etc. E.g. Percutaneous aortic valve replacement (PAVR) and resulting shifting turf wars.

Remaining uncertainty in the Cochrane Review  3.7  Clinical versus statistical significance. Something may be statistically significant but not clinically significant.  
Need to take into account all reviews (not just Cochrane Review).  
Could be merged into another criterion

Inequalities (impact of intervention thereon)  3.7  No universal scale, but remains important.  
Public Health Guidance from NICE may be a useful resource  
Often end up in grey literature, time-consuming work to do  
Clinical judgement  
Could be put into other criteria (e.g. DH strategic importance, variation in practice etc.)

Speed of evolution of field  3.6  Place into other criteria (e.g. emerging evidence etc. Horizon scanning)

Quality of existing evidence base  3.3  Collapse with remaining uncertainty

Already covered by NICE/ other HTA/ guideline  2.6  Collapse this criterion with above, possibly with variation in practice too  
NICE website  
NHS Evidence - National Library of Guidelines

Possible new criteria  License/ unlicensed use of drug  N/A  Lot of meds (particularly paediatrics) used outside of licence  
Could go in another criterion variation in practice, or clinical impact?  
e.g. Avastin  
The Cochrane Collaboration could play an important role that is difficult for national funded bodies  
Safety very important here

**REFINED LIST OF CRITERIA (POST-SECOND MEETING)**

The resulting list of refined criteria and suggestions for how they may be measured or assessed after the second meeting is shown in **Table 10**. After the second meeting, these criteria and methods of assessing them were tested out on a sample of Cochrane Reviews, and pragmatic decisions made about how the criteria might be assessed using easily available resources and in a reasonable timescale.

**TABLE 10: REFINED LIST OF CRITERIA**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Comments/definition</th>
<th>Resource/website</th>
<th>How/what to measure</th>
</tr>
</thead>
</table>
| Emerging evidence (ongoing/ completed trials) | 4.3 | 1. Number of RCTs published since Cochrane Review (e.g. tagged as such in MEDLINE)  
2. Number of RCTs published since Cochrane Review with an (e.g.) N>50  
3. Safety profiles/concerns  
4. Trial registers. Cochrane should list ongoing trials in each Cochrane Review, so can look to see if they have “gone live” since last Cochrane Review  
Safety/efficacy comes before cost-effectiveness  
Useful go/no go criteria (perhaps after strategic importance) – if there is nothing new, no point updating Cochrane Review (regardless of importance in other areas)  
Must include reviews outside of Cochrane  
DARE  
Can get information from:  
CRGs’ own trial registers (first port of call)  
WHO database  
NHS Evidence  
PubMed | | | |
| Potential clinical impact/ disruptive technology | 4.1 | To judge this criterion it would be really important to have a clinician in the field available for discussion at the review stage  
1. Judgement call? Yes/No  
2. Need for new equipment etc. Impact not only on clinical practice but also commissioning impact etc. E.g. Percutaneous aortic valve replacement (PAVR) and resulting shifting turf wars. | | |
| Remaining uncertainty in the Cochrane Review | 3.7 | Clinical versus statistical significance. Something may be statistically significant but not clinically significant.  
Need to take into account all reviews (not just Cochrane Review).  
Could be merged into another criterion | | |
| Inequalities (impact of intervention thereon) | 3.7 | No universal scale, but remains important.  
Public Health Guidance from NICE may be a useful resource  
Often end up in grey literature, time-consuming work to do  
Clinical judgement  
Could be put into other criteria (e.g. DH strategic importance, variation in practice etc.) | | |
| Speed of evolution of field | 3.6 | Place into other criteria (e.g. emerging evidence etc. Horizon scanning) | | |
| Quality of existing evidence base | 3.3 | Collapse with remaining uncertainty | | |
| Already covered by NICE/ other HTA/ guideline | 2.6 | Collapse this criterion with above, possibly with variation in practice too  
NICE website  
NHS Evidence - National Library of Guidelines | | |
| Possible new criteria License/ unlicensed use of drug | N/A | Lot of meds (particularly paediatrics) used outside of licence  
Could go in another criterion variation in practice, or clinical impact?  
e.g. Avastin  
The Cochrane Collaboration could play an important role that is difficult for national funded bodies  
Safety very important here | | |
<table>
<thead>
<tr>
<th>Strategic importance</th>
<th>Strategic importance of the condition/intervention/area to the DH or the NHS. Cochrane Reviews in areas considered to be of high strategic importance would be given higher priority</th>
<th>Top 60 conditions based on WHO burden of disease work QOF National quality board National Public Health Service/Health Protection Agency National Screening Committees DH National Programmes of Delivery or work programmes QIPP Resources indicating whether health inequalities exist in the area that could be impacted by the intervention</th>
<th>e.g. If the condition/intervention appears in two or more lists, this gets a “Yes”; if not, “No” Alternatively, those identified as strategic priorities in more of these resources are prioritised over those with less evidence of strategic importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient importance/impact</td>
<td>How much impact the condition has on the patient’s quality of life. For example, conditions with major impact on quality of life could be prioritised over conditions with less impact on quality of life</td>
<td>BMJ article: Speight and Barendse, United States of America Food and Drug Administration guidance on patient reported outcomes, 2010 King’s Fund – Jocelyn Cornwell? Institute of Medicine 2001 definition of patient-centred care?</td>
<td>e.g. Evidence of the importance of a condition to patient from the research literature could be used to support the prioritisation of a Cochrane Review. However, may be difficult to assess.</td>
</tr>
<tr>
<td>National spend</td>
<td>Spend on the drug, intervention or condition, whichever is more appropriate. Drugs/interventions/conditions with high spends would be given precedence over lower-spend conditions</td>
<td>Cochrane Review Guidelines NHS prescription costs MEDLINE Embase</td>
<td>e.g. 1. Spend on drug/intervention (£ per year in the NHS) 2. Spend on condition (£ per year in the NHS) 3. Spend on currently used alternative treatments (£ per year in the NHS) 4. Societal cost</td>
</tr>
<tr>
<td>Burden of disease</td>
<td>The national burden associated with the disease/condition, including its incidence or prevalence (whichever is more appropriate), and disability associated with the condition. Conditions associated with greater burden would be given precedence over less common conditions</td>
<td>Cochrane Review Guidelines MEDLINE Embase WHO Global Burden of Disease disability weights for diseases and conditions</td>
<td>e.g. 1. Incidence (x cases per y of population per z time) 2. Prevalence (x cases per y of population) 3. Change in incidence/prevalence in recent time 4. DALYs associated with the condition</td>
</tr>
<tr>
<td>Emerging evidence</td>
<td>What new evidence has become available since the last update, and how rapidly is the field evolving. For example, updates should be a priority in areas where new, high-quality evidence (e.g. large RCTs) has become recently available. For areas with other more recent high-quality systematic reviews these would be lower priority</td>
<td>CENTRAL/CRG specialised register Other trial registries e.g. WHO database Guideline portals NHS Evidence MEDLINE Embase CRD</td>
<td>e.g. 1. Number of RCTs published since Cochrane Review (e.g. tagged as such in MEDLINE) 2. Number of RCTs published since Cochrane Review with (e.g.) N&gt;50 3. Number of new UK RCTs published since Cochrane Review 4. Rate of publication of new RCTs since Cochrane Review 5. Existence of any new safety warnings about the treatment 6. New systematic reviews or guidance on the review question</td>
</tr>
</tbody>
</table>
Potential clinical impact/disruptive technology
Whether the intervention has the potential to cause changes/be disruptive to normal NHS clinical practice. Cochrane Reviews would be given priority for updating where interventions have the potential to be disruptive.

Necessary to have a clinician make a judgement call based on existing practice

Cochrane Review
Other systematic reviews
UK DUETs
Resources assessing variation in clinical practice

Remaining uncertainty in the Cochrane Review area
Whether the Cochrane Review (or other systematic review) has been able to come to robust conclusions regarding the questions it posed. Cochrane Reviews with less robust conclusions would be given precedence over those with more robust conclusions.

Appendix 4: Draft tool feedback questionnaire (in lieu of an NHS Engagement Prioritisation Meeting)
The following questionnaire was sent to panellists via email along with the draft prioritisation tool and the results of the trial prioritisation of 19 sample Cochrane Reviews.

- What are your overall thoughts on the tool?
- Is it sensible to have a scoring element, or should it just list areas to discuss?
- Should some questions have “weighted” scores – if so, which ones do you think are most important?
- Similarly, should some questions lead to “definitely update” or “definitely do not update” decisions?
- Do the questions adequately reflect important areas of consideration for identifying NHS priorities?
- Is the tool too long/complicated (or indeed too simple)?
- Should any questions be removed, reworded or added?
- Are the resources we refer to (e.g. presence/absence on certain lists) reasonable and fit for purpose?
- Did the tool successfully prioritise the most important Cochrane Reviews? If not, what order of priority do you think the Cochrane Reviews should be placed in?
- If no to the question above, do you think this is due to the questions in the prioritisation tool, or of our judgement when answering questions?
- Any other comments?

Appendix 5: Results of the test prioritisation
The Cochrane Reviews are ranked in order of priority based on their total scores in Tables 11, 12 and 13. The Microsoft Excel file summarising the breakdown of the scoring is available on request from the authors. (The full text of the Cochrane Reviews can be found on The Cochrane Library website).

<table>
<thead>
<tr>
<th>Score</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Posterior versus lateral surgical approach for total hip arthroplasty in adults with osteoarthritis</td>
</tr>
<tr>
<td>11</td>
<td>Multidisciplinary rehabilitation for older people with hip fractures</td>
</tr>
<tr>
<td>11</td>
<td>Intraarticular corticosteroid for treatment of osteoarthritis of the knee</td>
</tr>
<tr>
<td>10</td>
<td>Paracetamol versus nonsteroidal anti-inflammatory drugs for rheumatoid arthritis</td>
</tr>
<tr>
<td>8</td>
<td>Acupuncture and electroacupuncture for the treatment of rheumatoid arthritis</td>
</tr>
<tr>
<td>8</td>
<td>Patient education for adults with rheumatoid arthritis</td>
</tr>
<tr>
<td>5</td>
<td>Methotrexate for treating rheumatoid arthritis</td>
</tr>
<tr>
<td>4</td>
<td>Calcium and vitamin D for corticosteroid-induced osteoporosis</td>
</tr>
</tbody>
</table>
**Table 12: Results of the Test Prioritisation for the Cochrane Heart Group**

<table>
<thead>
<tr>
<th>Score</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Influenza vaccines for prevention of coronary heart disease</td>
</tr>
<tr>
<td>12</td>
<td>Low glycaemic index diets for coronary heart disease</td>
</tr>
<tr>
<td>12</td>
<td>Smoking cessation for secondary prevention of coronary heart disease</td>
</tr>
<tr>
<td>10</td>
<td>Hawthorn extract for chronic heart failure</td>
</tr>
<tr>
<td>8</td>
<td>Dual versus single chamber ventricular pacemakers for sick sinus syndrome and atrioventricular block</td>
</tr>
<tr>
<td>8</td>
<td>Beta-blockers for hypertension</td>
</tr>
</tbody>
</table>

**Table 13: Results of the Test Prioritisation for the Cochrane Infectious Diseases Group**

<table>
<thead>
<tr>
<th>Score</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Polymer based oral rehydration solutions for acute watery diarrhoea</td>
</tr>
<tr>
<td>7</td>
<td>Prophylactic antimalarial drugs for preventing malaria in travellers</td>
</tr>
<tr>
<td>6</td>
<td>Corticosteroids for tuberculous pleurisy</td>
</tr>
<tr>
<td>6</td>
<td>Antibiotics for salmonella gut infections</td>
</tr>
<tr>
<td>5</td>
<td>Vaccines for anthrax</td>
</tr>
</tbody>
</table>
Appendices to Part 2

Appendix 6: Metarank user guide

SOFTWARE REQUIREMENTS:
StataCorpLP (minimum version 9.0)
Stata commands:
- **metan** (minimum version 1.0)
- **metabias** (minimum version 2009)
- **rnd**
- **cii**
The program folder contains four programs (**metarank**, **metapows**, **metasign** and **metagens**), the help file (**metarank.hlp**), and dialog file (**metarank.dlg**).

The accompanying sample data folder contains four datasets—two with continuous data and two with binary data. The files ending in x are the files where event numbers, or mean and standard deviation, in new studies have been deleted to allow for simulation of the missing values.

INSTALLATION
The process is outlined in the following steps:
1. Open Stata.
2. Type “sysdir” into the command window and press return. A list of pathnames is printed to the results window. One of the pathnames will be preceded by PERSONAL
3. Using Window Explorer, locate this personal folder.
4. Copy the contents of the program folder into your personal folder.
5. In Stata open one of the datasets in the “sample data” folder or open your own dataset.
6. Type **metarank** followed by the variable list and required options (see help **metarank**) into the command window and press return. E.g.
   ```stata
   metarank treatment_ss treatmentmean treatmentsd control_ss controlmean controlsd, show(old_estimate old_p new_estimate new_p) by(reviewid) new(newid) sstat(stat) model(model) signal(probability) nit(1) ndisplay
   ```
7. To use the dialogue box, type **db metarank**. The dialogue box shown in **Figure 10** should appear:

![Figure 10: Dialogue box in Stata](image)

To install the dialog box in User>Statistics menu via Stata commands type:
```stata
.window menu append item "stUserStatistics" "meta&rank (Signals for prioritising updates of meta-analyses)" "db metarank"
.window menu refresh
```
To permanently install, place the commands in your -profile.do- file.
Appendices to Part 3

Appendix 7: Initial CRG questionnaire on updating

- What factors impede the updating of Cochrane Reviews?
- Please rank these factors by negative impact on updating
- Are these factors mostly the responsibility of the CRG, the author, or others?
- If the Cochrane Collaboration was to offer central updating support for priority out-of-date Cochrane Reviews, do you think that your CRG would use it?
- If so, what would be the key features that would make you want to use it?
- What do you think a central updating support system could do to increase the number of priority Cochrane Reviews being published, and to increase the speed of priority Cochrane Reviews through the editorial process?

| TABLE 14: CRG QUESTIONNAIRE FOR RANKING PROCESSES THAT COULD BE PERFORMED BY A CENTRAL UPDATING SUPPORT SYSTEM |

Please score the following processes, that could be performed by a central updating support system, by ability to increase the number of priority Cochrane Reviews being published and to increase the speed of priority Cochrane Reviews through the editorial process (from 0 to 5, where 0 is no impact at all, and 5 is greatest positive impact).

<table>
<thead>
<tr>
<th>For authors (CRG score of ability to affect number of Cochrane Reviews being published, and speed of publication)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For CRGs (CRG score of ability to affect number of Cochrane Reviews being published, and speed of publication)</td>
</tr>
</tbody>
</table>

Appendix 8: List of tasks offered (Table 15)

<table>
<thead>
<tr>
<th>TABLE 15: LIST OF TASKS OFFERED IN THE CENTRAL UPDATING SERVICE, WITH ESTIMATED TIMES PER TASK Before the Project Began, and REVISED ESTIMATED TIMES PER TASK After the Project Finished*</th>
</tr>
</thead>
</table>

---

Page 44 of 66
Performing the search | At least 4 hours | Traditional search: 7 hours (6 Cochrane Reviews) MEDLINE-only search: 2 hours (2 Cochrane Reviews)
---|---|---
Appraising the abstracts for inclusion/exclusion, recording the information and sending to author | 5 mins per paper | 2.6 mins per paper (9 Cochrane Reviews)
Obtaining full-text papers and sending to author | 15 mins per paper | 9.2 mins per paper (8 Cochrane Reviews, 148 papers)
Appraising full-text papers for inclusion/exclusion, recording the information and sending to author | 30 mins per paper | 12.5 mins per paper (8 Cochrane Reviews, 173 papers)
Inputting the selected references into RevMan | 5 mins per paper | 6.7 mins per paper (1 Cochrane Review, 18 papers)
Extracting data, recording data extraction, and reconciling data extraction with the author | 2 hours per paper | 4.1 hours per study for the combined extraction of outcome data, characteristics data and risk of bias data (5 Cochrane Reviews, 35 studies)
Performing the risk of bias, recording data extraction, and reconciling data extraction with the author | 30 mins per paper | 40.8 mins per paper (3 Cochrane Review, 54 papers)
Inputting extracted data or risk of bias assessments into RevMan | 30 mins per paper | 7.6 mins per paper for risk of bias (2 Cochrane Reviews, 27 papers) 56.3 mins per study for combined outcome data, characteristics data and risk of bias data (2 Cochrane Reviews, 8 papers)
Assisting authors with the interpretation of results and the discussion | 1 day | Not estimable (too variable and too few data)
Assisting authors with the abstract and plain language summary | 1 day | Not estimable (not performed)
Assisting authors with addressing peer-review comments | 0.5 days | Not estimable
Creating the summary of findings tables | 1 day | 20 hours (3 Cochrane Reviews)**
Checking text for sense, spelling and grammar before being sent to the CRG | 0.5 days | Not estimable (not performed)
Finding names for possible new author teams to update an existing Cochrane Review | 2 hours per 5 names | Not estimable (not performed)
Finding names for possible referees | 2 hours per 5 names | Not estimable (not performed)

*Not all tasks performed in the updating phase contributed to the revised estimated times, as on some occasions several tasks were performed together, but only one time was recorded.

**Creating Summary of Findings tables in one Cochrane Review unexpectedly involved duplicate data extraction of the withdrawal outcome, obtaining consensus data, entry of these data into RevMan, and meta-analysis of the results.

Appendix 9: CRG and author questionnaire evaluating the updating service

**PLEASE TICK (1–5) HOW YOU THINK THE ASSISTANCE AFFECTED THE AUTHORS’ MOTIVATION TO UPDATE(S) THE COCHRANE REVIEW(S).**

1) The assistance greatly improved author motivation to update the Cochrane Review(s)  
2) The assistance improved author motivation to update the Cochrane Review(s)  
3) The assistance did not affect author motivation to update the Cochrane Review(s)  
4) The assistance lessened author motivation to update the Cochrane Review(s)  
5) The assistance greatly lessened author motivation to update the Cochrane Review(s)  

Comment: ______________________________________

**PLEASE TICK (1–5) HOW YOU THINK THE ASSISTANCE AFFECTED THE SPEED OF THE COCHRANE REVIEW UPDATE(S).**

1) The assistance greatly improved the speed of the update(s)  
2) The assistance improved the speed of the update(s)  
3) The assistance did not affect the speed of the update(s)  
4) The assistance slowed down the speed of the update(s)  
5) The assistance greatly slowed down the speed of the update(s)  

Comment: ______________________________________
Please tick (1–5) how you think the assistance affected the quality of the Cochrane Review update(s).

1) The assistance greatly improved the quality of the update(s)  
2) The assistance improved the quality of the update(s)  
3) The assistance did not affect the quality of the update(s)  
4) The assistance worsened the quality of the update(s)  
5) The assistance greatly worsened the quality of the update(s)  

Comment:__________________________________________________________________________________

Please tick (1–5) your overall impression of the assistance provided.

1) The assistance greatly helped with the update(s)  
2) The assistance helped with the update(s)  
3) The assistance did not help with the update(s)  
4) The assistance hindered the update(s)  
5) The assistance greatly hindered the update(s)  

Comment:__________________________________________________________________________________

What was the best aspect of the assistance provided?
Comment:__________________________________________________________________________________

What was the worst aspect of the assistance provided?
Comment:__________________________________________________________________________________

Do you think a centralised updating support service, which could offer 10–20 hours per update(s) of a priority Cochrane Review(s), should be rolled out across The Cochrane Collaboration?

Yes  
No  

Comment:__________________________________________________________________________________

What could be done to improve a centralised updating service?
Comment:__________________________________________________________________________________

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### Appendix 10: Tasks performed during the updating project (Table 16)

#### Table 16: Tasks performed on the Cochrane Reviews and time taken per task

<table>
<thead>
<tr>
<th>Task</th>
<th>Time taken (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MUSCULOSKELETAL GROUP COCHRANE REVIEW 1:</strong> Ortiz Z, Shea B, Suarez-Almazor ME, Moher D, Wells GA, Tugwell P. Folic acid and folinic acid for reducing side effects in patients receiving methotrexate for rheumatoid arthritis. <em>Cochrane Database of Systematic Reviews.</em></td>
<td>6.8</td>
</tr>
<tr>
<td>MEDLINE-only search and screening (performing the Simple Boolean search, performing the related article search, importing both sets of results into bibliographic database, exporting to authors), and preparing the search methodology text for the author for inclusion into the Cochrane Review.</td>
<td>4</td>
</tr>
<tr>
<td>Appraising 266 abstracts</td>
<td>6.8</td>
</tr>
<tr>
<td>Obtaining 9 full-text papers</td>
<td>1</td>
</tr>
<tr>
<td>Appraising 18 papers</td>
<td>6.5</td>
</tr>
<tr>
<td>Extracting risk of bias data for 7 studies</td>
<td>7.75</td>
</tr>
<tr>
<td>Drafting the summary of findings table and importing into RevMan (this task unexpectedly also involved duplicate data extraction of the withdrawal outcome, obtaining consensus data, entry of these data into RevMan, and meta-analysis of the results)</td>
<td>27</td>
</tr>
<tr>
<td>Phone call with author to resolve queries regarding data extraction and summary of findings, and subsequent entry of the correct data and summary of findings table in to RevMan</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>60.55</td>
</tr>
</tbody>
</table>

**Status as of June 2011:** The update has been submitted to the CRG, and the text is being finalised with the author

| **MUSCULOSKELETAL GROUP COCHRANE REVIEW 2:** Green S, Buchbinder R, Hetrick SE. Acupuncture for shoulder pain. *Cochrane Database of Systematic Reviews.* | 8                |
| Traditional multi-database update search                            | 8                |
| Peer-review of search                                               | 2                |
| Appraising 267 abstracts                                            | 16.1             |
| Appraising 44 papers                                                 | 15               |
| Obtaining 44 full-text papers (many Chinese)                        | 8                |
| Total                                                               | 49.1             |

**Status as of June 2011:** The authors are performing data extraction for the update

| **MUSCULOSKELETAL GROUP COCHRANE REVIEW 3:** Buchbinder R. NSAIDs for shoulder pain. *Cochrane Database of Systematic Reviews.* | 8                |
| Traditional multi-database update search                            | 8                |
| Peer-review of search                                               | 2                |
| Appraising 125 abstracts                                            | 10.5             |
| Obtaining 2 full-text papers                                        | 0.5              |
| Appraising 4 papers                                                 | 2.25             |
| Total                                                               | 23.25            |

**Status as of June 2011:** The authors are performing data extraction for the update
MUSCULOSKELETAL GROUP COCHRANE REVIEW 4:
Suarez-Almazor ME, Belseck E, Shea B, Tugwell P, Wells GA. Methotrexate for treating rheumatoid arthritis. *Cochrane Database of Systematic Reviews*

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional multi-database update search</td>
<td>8</td>
</tr>
<tr>
<td>Peer-review of search</td>
<td>2</td>
</tr>
<tr>
<td>Appraising 139 abstracts</td>
<td>10</td>
</tr>
<tr>
<td>Obtaining 3 full-text papers</td>
<td>0.25</td>
</tr>
<tr>
<td>Appraising 3 papers</td>
<td>1</td>
</tr>
<tr>
<td>Extracting outcome, risk of bias and included studies data for 1 study (3 papers)</td>
<td>7.3</td>
</tr>
<tr>
<td>Total</td>
<td>28.55</td>
</tr>
</tbody>
</table>

Status as of June 2011: The text is being finalised by the authors, and the update is almost ready to submit to the CRG

MUSCULOSKELETAL GROUP COCHRANE REVIEW 5:
Trevisani VFM, Castro AA, Ferreira Neves Neto JFNN, Atallah ÁN. Cyclophosphamide versus methylprednisolone for treating neuropsychiatric involvement in systemic lupus erythematosus. *Cochrane Database of Systematic Reviews*

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appraising 294 abstracts</td>
<td>4.5</td>
</tr>
<tr>
<td>Extracting risk of bias data for 1 study</td>
<td>2</td>
</tr>
<tr>
<td>Inputting risk of bias data into RevMan for 1 study</td>
<td>0.42</td>
</tr>
<tr>
<td>Drafting the summary of findings table</td>
<td>6</td>
</tr>
<tr>
<td>Ensuring consistency between summary of findings table and text</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>26.42</td>
</tr>
</tbody>
</table>

Status as of June 2011: The update has been submitted to the CRG, and the text is being finalised with the author

MUSCULOSKELETAL GROUP COCHRANE REVIEW 6:
Brouwer RW, van Raaij TM, Bierma-Zeinstra SMA, Verhagen AP, Jakma TT, Verhaar JAN. Osteotomy for treating knee osteoarthritis. *Cochrane Database of Systematic Reviews*

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDLINE-only search and screening (performing the Simple Boolean search, performing the related article search, importing both sets of results into bibliographic database, exporting to authors).</td>
<td>2</td>
</tr>
<tr>
<td>Drafting the summary of findings table and importing into RevMan</td>
<td>19.5</td>
</tr>
<tr>
<td>Total</td>
<td>21.5</td>
</tr>
</tbody>
</table>

Status as of June 2011: The update has been submitted to the CRG, and the text is being finalised with the author

INFECTIOUS DISEASES GROUP COCHRANE REVIEW 1:
Sinclair D, Zani B, Donegan S, Olliaro P, Garner P. Artemisinin-based combination therapy for treating uncomplicated malaria. *Cochrane Database of Systematic Reviews*

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
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<tr>
<td>Appraising 72 abstracts</td>
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<tr>
<td>Obtaining 44 full-text papers</td>
<td>5.5</td>
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<tr>
<td>Appraising 44 papers</td>
<td>4.5</td>
</tr>
<tr>
<td>Inputting 44 references into RevMan, and extracting outcome, risk of bias and included studies data for 22 studies</td>
<td>93.75</td>
</tr>
<tr>
<td>Total</td>
<td>109.75</td>
</tr>
</tbody>
</table>

Status as of June 2011: The authors are inputting the extracted data into RevMan, and revising the text

PAIN, PALLIATIVE AND SUPPORTIVE CARE GROUP COCHRANE REVIEW 1:
Chronicle EP, Mulleners WM. Anticonvulsant drugs for migraine prophylaxis. *Cochrane Database of Systematic Reviews*

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>Emailing new co-author about the project and sending ICMJE form</td>
<td>0.5</td>
</tr>
<tr>
<td>Group</td>
<td>Status as of June 2011</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------</td>
</tr>
<tr>
<td>PAIN, PALLIATIVE AND SUPPORTIVE CARE GROUP COCHRANE REVIEW 2: Bell RF, Eccleston C, Kalso EA. Ketamine as an adjuvant to opioids for cancer pain. <em>Cochrane Database of Systematic Reviews</em></td>
<td>Traditional multi-database update search</td>
</tr>
<tr>
<td>NEONATAL GROUP COCHRANE REVIEW 1: Jacobs SE, Hunt R, Tarnow-Mordi WO, Inder TE, Davis PG. Cooling for newborns with hypoxic ischaemic encephalopathy. <em>Cochrane Database of Systematic Reviews</em></td>
<td>Extracting risk of bias data for 46 studies</td>
</tr>
<tr>
<td>AIRWAYS GROUP COCHRANE REVIEW 1: Nannini LJ, Cates CJ, Lasserson TJ, Poole P. Combined corticosteroid and long-acting beta-agonist in one inhaler versus long-acting beta-agonists for chronic obstructive pulmonary disease. <em>Cochrane Database of Systematic Reviews</em></td>
<td>Extracting outcome, risk of bias and included studies data for 4 studies</td>
</tr>
<tr>
<td>WOUNDS GROUP COCHRANE REVIEW 1: Loeb MB, Main C, Eady A, Walkers-Dilks C. Antimicrobial drugs for treating methicillin-resistant Staphylococcus aureus colonization. <em>Cochrane Database of Systematic Reviews</em></td>
<td>Appraising 180 abstracts</td>
</tr>
<tr>
<td></td>
<td>Obtaining 11 full-text papers (required ILLs)</td>
</tr>
<tr>
<td></td>
<td>Assessing tasks in the Cochrane Review, creating Endnote database and updating with PDFs, assessing 11 PDFs for inclusion and discussing results with authors, reviewing included studies and contacting editorial team, creating risk of bias tables for included studies</td>
</tr>
<tr>
<td></td>
<td>Call with author</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>WOUNDS GROUP COCHRANE REVIEW 2: Nelson EA, Bell-Syer SEM, Cullum NA, Webster J. Compression for preventing recurrence of venous ulcers. <em>Cochrane Database of Systematic Reviews</em></td>
<td>Appraising 59 abstracts</td>
</tr>
<tr>
<td></td>
<td>Obtaining 27 full-text papers</td>
</tr>
<tr>
<td></td>
<td>Appraising 54 papers</td>
</tr>
<tr>
<td></td>
<td>Adding 18 references to excluded studies in RevMan</td>
</tr>
<tr>
<td></td>
<td>Extracting outcome and included studies data for 3 studies (5 papers), and extracting risk of bias data for 4 studies (8 papers)</td>
</tr>
<tr>
<td></td>
<td>Inputting extracted data into RevMan</td>
</tr>
</tbody>
</table>
Inserting a query regarding the search dates (a note near the ‘dates’ section and near ‘electronic searches’ because of queries regarding search dates.)
Accepting all the changes that were tracked in the version received, unless there were questions, in which case the tracks remained and a note was added in RevMan with a question.
Including Vandongen, adding characteristics of the study and risk of bias table details.
Filling in characteristics of study for Milic and the risk of bias for this study too.
Adding ulcer recurrence at 6 months and ulcer recurrence at 12 months – these are outcomes from Vandongen.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
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</thead>
<tbody>
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<td>Inserting a query regarding the search dates</td>
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<tr>
<td>Accepting all the changes that were tracked in the version received</td>
<td></td>
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<tr>
<td>Including Vandongen, adding characteristics of the study and risk of</td>
<td></td>
</tr>
<tr>
<td>bias table details</td>
<td></td>
</tr>
<tr>
<td>Filling in characteristics of study for Milic and the risk of bias for</td>
<td></td>
</tr>
<tr>
<td>this study too</td>
<td></td>
</tr>
<tr>
<td>Adding ulcer recurrence at 6 months and ulcer recurrence at 12 months –</td>
<td></td>
</tr>
<tr>
<td>these are outcomes from Vandongen.</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
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</tbody>
</table>

Status as of June 2011: The update has been submitted to the CRG, and the text is being finalised with the author

WOUNDS GROUP COCHRANE REVIEW 3:
Wasiak J, Cleland H, Campbell F. Dressings for superficial and partial thickness burns. *Cochrane Database of Systematic Reviews*

<table>
<thead>
<tr>
<th>Activity</th>
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<td>Appraising 34 abstracts</td>
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<tr>
<td>Obtaining 6 full-text papers</td>
<td>1</td>
</tr>
<tr>
<td>Appraising 6 papers</td>
<td>1</td>
</tr>
<tr>
<td>Double data extraction for one reference and adding to RevMan</td>
<td>5.25</td>
</tr>
<tr>
<td>Inputting risk of bias assessment into RevMan for 26 references</td>
<td>3</td>
</tr>
<tr>
<td>Extracting outcome, risk of bias and included studies data for 4 studies</td>
<td>10</td>
</tr>
<tr>
<td>Inputting extracted data into RevMan</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23.75</td>
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Status as of June 2011: The updating service is continuing to provide support to the author in finalising the text for the update

Cochrane Reviews

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Extracting outcome, risk of bias and included studies data for 4 studies</td>
<td>10</td>
</tr>
<tr>
<td>Inputting extracted data into RevMan</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23.75</td>
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</table>

Status as of June 2011: The updating service is continuing to provide support to the author in finalising the text for the update

Total for all Cochrane Reviews

<table>
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<tr>
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<th>Time</th>
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<tr>
<td><strong>Inputting extracted data into RevMan</strong></td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>497</td>
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</tbody>
</table>

The times above do not include general correspondence with the authors and CRGs, or project management, which we estimated to be 278 hours during the course of the project.
Appendix 11: Procedures for the MEDLINE-only search

Cochrane Updating Procedures for gathering included studies
This document contains procedures for gathering the included studies and building the Cochrane Review-level Reference Manager databases and spreadsheets.

1. Gathering included studies
   - Locate full text of Cochrane Review in The Cochrane Library and find the Cochrane ID.
     - On the first page of the study, you will see a field called Citation and the Cochrane ID is recorded there as “CDxxxxx”.
   - Create a folder with the Cochrane ID and Cochrane Review name (i.e., CD003527 Acupuncture for lateral elbow pain).
   - Save the Cochrane Review in the folder.
   - Open the Microsoft Excel file Cochrane updating – review spreadsheet and rename with the same name as the folder (i.e., CD003527 Acupuncture for lateral elbow pain).

2. PubMed IDs
   - Locate the Included Study Table (in Acrobat Reader, type “Characteristics of included studies” in Find box located at the top right corner of the page).
     - The full study title is found in the References section (in Acrobat Reader, type “references” in Find box located at the top right corner of the page).
       - Save study ID name in the Microsoft Excel file in the column Study ID (i.e., Brouwer 2006).
       - Go to PubMed and cut and paste the title into PubMed. If you do not find the reference, include the year and/or author by combining with Boolean operator AND (i.e., Laser treatment applied to acupuncture AND 1990).
       - Click on Send to in the upper right corner.
       - Select PubMed clipboard.
       - Do this for all included studies.
       - If there is a Study ID with more than one reference, add all references. Use the Primary column to record the primary study with 1. Mark all the other ones with 0. All will include the same Study ID. The main reference should be the main report of the trial.
     - Save from the PubMed clipboard using the saved file function. To do this:
       - Click Send to (in the upper left corner of the record).
       - Select File.
       - Select Format = MEDLINE (verify you have the right number of references).
       - Create a new file. You can save using the default name in a location that is easy for you (on the desktop is fine).
       - Note 1: It is best to have one Reference Manager database open at a time to avoid confusion.
       - Note 2: Check to see all references were added to the file.
       - Note 3: If an included study was not in PubMed, try various searches using single citation matcher to in case there are errors in the reference. Verify if the journal is indexed by MEDLINE.
       - If a study is NOT found in PubMed, leave the PMID blank and note NF in the notes field.

3. Reference Manager database
   - Create a new Reference Manager database in the Cochrane Review folder. Use Cochrane ID and Cochrane Review name (i.e., CD003527 Acupuncture for lateral elbow pain).
   - Import the references from the saved file. To do this:
     - Click File.
       - Click Import text file.
       - Import using the specialised filter (PubMed for updating.cap).
       - Select the text file from where you saved it.
       - Click Import.
Verify that all the references were imported.  
- If some were missed, double check that references were saved in the right format and imported with the right filter and repeat the download procedure.
- Verify that the references are complete and imported properly.

4. **Exporting to Microsoft Excel**  

- In the Reference Manager:  
  - Click Tools.  
  - Click Bibliography.  
  - Click Generate from reference list.  
    - All references in list should be selected.  
    - The destination should be: File.  
    - Ensure Ref id option is selected under Optional fields on the left.  
    - Output style: Select the output style (updating primary studies from pubmed.os).  
  - Click OK to save to file.  
  - Pick a file name and save in Text only format and click Save.

- In the Cochrane Review Microsoft Excel file:  
  - Click File.  
    - Click Open.  
    - Select the bibliography (display all file types).  
    - Find the saved file, highlight it and click Open.  
    - Click Finish.  
    - This Microsoft Excel spread sheet includes studies from one Cochrane Review.  
    - Cut and paste these into the Cochrane Review Microsoft Excel file and match to study IDs.  
      - Check Year column to ensure that this field imported properly and edit as necessary.  
      - Add rows for studies not in PubMed.

- Put the cursor in the upper most left hand cell.  
  - Select Data and then Sort.  
    - Select Year column.  
    - Sort by Year descending (most recent will be at the top).  
      - Pick the three newest, add new to the newest column and copy the PMIDs to Column I Seed.  
      - Note: do not include rows with NF in the PMID column.

  - Add N.  
    - Go to the Cochrane Review PDF.  
    - Extract N from the Included Study Table of the Cochrane Review and record in N column.  
      - For study IDs with more than one reference, only record the N for the primary study. Leave the other references blank.  
      - Include the N for randomisation.  
      - If there is a number for both control and intervention, add these together.  
      - If there is no N reported, add NF (not found).  
    - Put the cursor in the upper most left hand cell.  
    - Go to Data, sort on N Column descending (largest will be at the top).  
    - Mark the biggest three as big in column H and copy the PMIDs to Column I Seed.  
    - Put the cursor in the upper most left hand cell.  
    - Go to Data, sort on Seed Column descending.  
      - Note: do not include rows with NF in the PMID column.  
      - Note: the IDs in the Seed column will no longer match the data in the rows – this is correct!

  - Add RCT  
    - Record whether or not RCTs/CCTs only as eligibility criteria (yes/No, 1/0). Note: This will allow the limiting to RCTs/CCTs in the focused Boolean and related articles searches.  
    - Add to all rows, as these get re-arranged when the seed is sorted.
• Add Transpose row.
  o Copy the PMIDS in the Seed Column (using ctrl C or copy).
  o Go to the 2\textsuperscript{nd} tab labelled Search comp.
  o Move cursor to the first cell to the left of the row highlighted orange (under the title Transpose).
  o Click Edit.
  o Click Paste special.
    ▪ Click Transpose box.
  o Click Save.

• Record the search comprehensiveness information.
  o Go to the 2\textsuperscript{nd} tab labelled Search comp.
  o Go to the Cochrane Review PDF and located the search information in the Methods section (or type Search methods in the Find box in the PDF).
  o Add date of the last search that was done – either original search or updated search.

• Ensure that the fields in line 13 are transposed correctly. You may need to edit the cells by searching for [Cochrane updating - review spreadsheet.xls] and replacing this with nothing.

\textbf{FIGURE 11: editing the cells by searching for [Cochrane updating - review spreadsheet.xls] and replacing this with nothing}
Figure 12: Spreadsheet for gathering included studies

Simple Boolean MEDLINE Search

The first part of the MEDLINE update is a simple Boolean search of the condition combined with the intervention, and limited to the year of the previous search and publication type; “RCT”. The Boolean approach requires knowledge of search techniques. A structured approach was taken to developing these queries in order to reduce operator dependence and maximise the generalisability of results. The following are step-by-step instructions for developing and executing these searches in the OVID MEDLINE interface. Part one involves analysing the topic and searching the subject area.

Boolean Search Part 1
1. Select article to be updated and read the abstract.
2. Identify key words for the condition, population (if it is children or elderly, for example) and for the intervention.
3. Read the methods section to determine when the search was performed. If no date is given, search from the year before the date of publication.
4. Open OVID MEDLINE
5. Enter key words for the condition and determine the most appropriate MeSH heading. If a suitable MeSH heading is found, then there is no need to combine with natural language key words.
6. Enter key words for the intervention and determine the most appropriate MeSH heading. If a suitable MeSH heading is found, there is no need to combine key words.
7. If necessary combine using OR the key words & MeSH headings you have selected for the intervention & condition.
8. Then combine the two concepts (Intervention AND Condition).

Boolean Search Part 2
Part 2 involves limiting the Subject Search to type of study design using pre-determined OVID Limits.

9. Limit the search to the year you noted earlier. Either the year the search was done, or the year before the paper was published.
10. To limit your results to RCT-AIM results, click More Limits.
11. Select the line of your subject search limited by year.
12. Check the box marked AIM Abridged Index Medicus.
13. Scroll down until you get to Publication Types.
14. Select Randomized Controlled Trials.
15. Click Limit Search.
16. Save the search results by selecting options at the bottom of the screen called Results Manager.
17. In the first column, select the option: All in this set.
18. In the second column, click the red box Select Fields.
19. Deselect all the fields EXCEPT for UI – unique identifier.
20. In the third column select: Brief (Titles) Display and Include Search History.
21. In the Sort Keys section for Primary, choose Year of publication and Descending and in Secondary, choose Entry Date and Descending.
22. Click Save.
23. The filename should reflect the cohort number, the method of search and the number of results, for example: 151 RCT AIM (25).txt
25. To limit your results to CQ, click More limits.
26. Select the line of your subject search limited by year.
27. Scroll down until you get to Clinical Queries.
28. Select Therapy (Optimized).
29. Click Limit Search.
31. Again, the filename should reflect the cohort number, the method of search and the number of results, for example: 151 CQ (143).txt
32. Return to Main Search Page.
33. To limit your results to MA (Meta-analysis), click More Limits.
34. Select the line of your subject search limited by year.
35. Scroll down until you get to Publication Types.
36. Select Meta-analysis.
37. Click Limit Search.
38. Perform steps 16–22.
39. Again, the filename should reflect the cohort number, the method of search and the number of results, for example: 151 MA (10).txt
40. Return to the main search page.
41. Now you have done the subject searching. To save the search click Save Search/alert.
42. You will be prompted for your user name: “epcupdating” and password “xxxxxx”.
43. Name the search “SS 151” and select Permanent.
44. Select Save.
45. Return to main page and delete the set to begin a new search.

Examples of Subject Searches
Feature scoring: 5 terms and exploded terms (lines 1, 2, 3). The clinical query used is the sensitivity query.
1. exp Heparin/
2. exp Warfarin/
3. exp Venous Thrombosis/
4. Arthroplasty, Replacement, Knee/
5. Arthroplasty, Replacement, Hip/
6. 1 or 2
7. 4 or 5
8. 3 and 6 and 7
9. limit to yr=2000–2006 and randomized controlled trial)

Feature scoring: 4 terms, exploded terms (line 1) and free text terms (line 3)
1. exp Indomethacin/
2. Ductus Arteriosus, Patent/
3. Cerebral Hemorrhage/ or intraventricular hemorrhage.mp.
4. 2 or 3
5. 1 and 4
6. limit to yr=1994–2006 and randomized controlled trial


Feature scoring: 2 terms, starred terms (lines 1 and 2) and subheadings (line 2).
1. *Angioplasty, Transluminal, Percutaneous Coronary/
2. *Myocardial Infarction/tu, dt
3. 1 and 2
4. limit to yr=1995–2006 and randomized controlled trial

COCHRANE UPDATING PROCEDURES FOR RELATED ARTICLES UPDATE SEARCH
This document contains procedure for running update searches and building the updating in Reference Manager database for level one screening.

1. PubMed update search
   • Open the Microsoft Excel file of the Cochrane Review you are working on (i.e., CD003527 Acupuncture for lateral elbow pain).
     o Go to the second file tab Search comp and Copy (ctrl C) the cells in row 13 (these are the seeds).
   • Create a new Reference Manager database (i.e., CD003527_update_ Acupuncture for lateral elbow pain) – make sure to add Update after the ID numbers.
     o Create this is a new folder called Update under the original Cochrane Review folder.
   • Open PubMed.
     o Sign into your NCBI account to see all features needed.
     o Paste (ctrl V) the seeds from Microsoft Excel into the search box and click on Search.
     o You should see the results for the seeds.
     o Go the right side of the screen and under Find related data select the Database as PubMed, and select the Option as Related Citations and then click Find items box (See Figure 13).
Go to limit at the top of the screen above the search box and select Limits.

Under Limits, go to the Type of article section and select Clinical trial and Randomized controlled trial.

Limit the search from the year of the last included study to present.

Click Search box at the bottom of the page.

You will see results for all limits next.

Click on the Advanced search link the top of the screen above the search box.
Combine the related items line (line #2, in example below in Figure 16) with the search limits (line #3, in example below) using the Boolean operator AND.

Save all records to the clipboard.

Figure 16: Combining lines in search history

Save from the PubMed clipboard using the saved file function. To do this:
- Send to (in the upper left corner of the record).
- Select File.
- Select Format = MEDLINE (verify we have the right number of references).
- Create a new file. You can save using the default name in a location that is easy for you (on the desktop is fine).

2. Importing into Reference Manager
- Import into the Reference Manager database. To do this:
  - Click File.
  - Click Import text file.
  - Import using the specialized filter (PubMed for updating.cap).
  - Select the text file from where you saved it.
  - Click Import.
  - Verify that all the references were imported.
  - If some were missed, double check that references were saved in the right format and imported with the right filter and repeat the download procedure.
  - Verify that the references are complete and imported properly.

3. Screening citations in Reference Manager
- In UserDef 1, record Y (include) or N (exclude or unsure) based on the Cochrane Review criteria.

4. Saving search results in Microsoft Word document
- Create a Microsoft Word document (i.e., CD000951 Folic acid and folinic acid - search results.doc) with a screen cap of the final search results.

Cochrane Updating Procedures for building master spreadsheet
This document contains procedure for building the master spreadsheet.

1. Moving files from individual Cochrane Reviews to master file.
- Go to the first individual Cochrane Review spreadsheet.
- Go to the second tab Search comp.
- Cut Line 16 (see Figure 17).

**Figure 17: Moving files from individual review to master file**

- Go to the master file for the Cochrane Review.
- At Cell F of the next line number click paste.
- You may need to indicate the spreadsheet from where you are cutting and pasting the data (see Figure 18) as well as the spreadsheet in the file called search comp (see Figure 19) and click OK.

**Figure 18: Indicate the spreadsheet from where you are cutting and pasting the data**
Figure 19: Indicate the spreadsheet in the file called search comp
Appendix 12: Peer-review using the PRESS forum and checklist

**TABLE 17: COMPONENTS OF THE PRESS CHECKLIST**

<table>
<thead>
<tr>
<th>Components</th>
<th>Questions to ask of the search</th>
</tr>
</thead>
</table>
| **Translation** | ✓ Has the search question been translated into search concepts or PICO appropriately and adequately. I.e., does the search strategy match the clinical question?  
  ✓ Are the search concepts clear?  
  ✓ Are some of the search concepts too narrow or too broad for the actual clinical question?  
  ✓ Does the search seem to retrieve too many / too few records? |
| **Operators** | ✓ Were there any mistakes in the use of Boolean or proximity operators?  
  ✓ If NOT is used, can any unintended exclusions be imagined?  
  ✓ Consider if precision could be improved by using a proximity operator (adjacent, near, within) instead of AND. |
| **Subject headings** | ✓ Are the subject headings relevant?  
  ✓ Are subject headings missing?  
  ✓ Are incorrect subject headings used?  
  ✓ Are any subject headings too broad?  
  ✓ Are any subject headings too narrow?  
  ✓ Are subheadings attached to subject headings? Floating subheadings are preferred.  
  ✓ Are subheadings used instead of relevant subject headings?  
  ✓ Are both subject heading & natural language terms used?  
  ✓ If there is a reason provided for not doing so, does the reason appear sound? |
| **Natural language** | ✓ Did the search miss any spelling variants in free text?  
  ✓ Did the search miss any synonyms?  
  ✓ Did the search miss truncation?  
  ✓ If an acronym or abbreviation is used, is the full term also included?  
  ✓ Comment on apparently irrelevant or excessively broad natural language terms.  
  ✓ Check that both subject heading & natural language terms are used.  
  ✓ If there is a reason provided for not doing so, does the reason appear sound? |
| **Spelling & syntax** | ✓ Are there any incorrect spellings of words?  
  ✓ Are there any errors in system syntax or wrong line numbers? |
| **Limits** | ✓ Do any of the limits used seem unwarranted?  
  ✓ Are any potentially helpful limits missing?  
  ✓ Is starring (restrict to focus) used and if so, is there an explanation for this? |
| **Search strategy adapted** | ✓ Does the searcher indicate that the search strategy has been adapted for additional databases? |
PRESS Worksheet

1. Translation: Is the search question translated well into search concepts?
   - Adequate
   - Adequate with recommendations
   - Needs revision Provide an explanation or example

2. Operators: Are there any mistakes in the use of Boolean or proximity operators
   - Adequate
   - Adequate with recommendations
   - Needs revision Provide an explanation or example

3. Subject headings: Are any important subject headings missing or have any irrelevant ones been included?
   - Adequate
   - Adequate with recommendations
   - Needs revision Provide an explanation or example
4. Natural language: Are any natural language terms or spelling variants missing, or have any irrelevant ones been included? Is truncation used optimally?

- Adequate
- Adequate with recommendations
- Needs revision Provide an explanation or example

5. Spelling & syntax: Does the search strategy have any spelling mistakes or system syntax errors or wrong line numbers?

- Adequate
- Adequate with recommendations
- Needs revision Provide an explanation or example

6. Limits: Do any of the limits used seem unwarranted or are any potentially helpful limits missing?

- Adequate
- Adequate with recommendations
- Needs revision Provide an explanation or example

7. Adapted for db: Has the search strategy been adapted for each database to be searched?

- Adequate
- Adequate with recommendations
- Needs revision Provide an explanation or example
Acknowledgements

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Mr John Hilton (j.hilton@cochrane.org), Editor, Cochrane Editorial Unit, 13 Cavendish Square, London W1G 0AN, UK.

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