

Rationale: The process by which literature searches are performed to evaluate specific clinical questions can be quite labor intensive. Data which is most informative to clinical practice will often be reported in clinical trials and other prospective studies. When such research is well conducted and of high impact, it will likely be reported in major (or core as designated by Pubmed) clinical journals. This document provides an algorithm to streamline the literature search process for the AAEM CPC to quickly identify the most relevant studies. (Note: The validity of this methodology should be checked by comparing this process to literature searches performed on prior clinical questions such as pneumonia and determining the sensitivity and specificity for each strategy for studies of acceptable and good quality.) This process should allow for greater transparency and efficiency of this portion of CPC practice advisory development.

Proposed Process:

1. Clinical question and search terms are decided and explicitly stated. There should be no more than two primary authors.
2. The timing of the search should be pre-specified and may vary by type of question (example last 20 years for stroke thrombolysis studies.) In general, the initial search should be limited to the last 5 years. If inadequate results are yielded within 5 years, additional 5 year increments can be added at the discretion of the author.
3. Once a strategy has yielded an adequate number of published high quality research manuscripts, movement to lower tier evidence is not necessary.
4. For clinical treatment questions (addressed by trials) the following process can be employed. (All searches should be performed using Pubmed.gov, as it is freely available.) Other search engines may be used at the discretion of the author, assuming that the searches can be limited in similar fashion to below schema.
 - A. Tier 1: Search for systematic reviews. (Can add search term AND systematic[*sb*] {n.b. the *sb* in brackets alerts pubmed to search the study type field to determine whether it is a systematic review} or use the “Clinical Queries” choice on left hand side of menu on pubmed.gov website.) All relevant, well designed systematic reviews should be included and added to citations revealed in lower tiers. **Be sure to remove systematic review (systematic[*sb*]) as search term for next search.**
 - B. Tier 2: Perform search with pre-specified search terms and add the following limits: Humans, English, Randomized Controlled Trial, and Core Clinical Journals. The latter two are under “Type of Article.”
 - C. Tier 3: If B does not yield sufficient citations to review – change limits and remove the limit for “Core Clinical Journals”
 - D. Tier 4: If C does not yield sufficient citations to review – change limits and remove the limit for Randomized Controlled Trial and add a limit for “Clinical Trial”
 - E. Tier 5: If D does not yield sufficient citations to review – change limits and remove all except Humans and English.
 - F. If E does not yield sufficient citations – either sufficient evidence is not currently available or search strategy needs to be revised.
 - G. In addition, the references from recent published guidelines or recent review articles relevant to the clinical question may be scanned for screening of additional relevant articles. Other strategies (such as Google Scholar or another “forward search” that provides articles that have cited the ones identified in this process.)
5. When clinical questions are not well addressed by randomized trials certain types of epidemiological studies may be of the highest yield. The below process can be used when the type of question is not likely to be addressed by a clinical trial (example: association between smoking and lung cancer). This algorithm places higher weight on multi-center observation studies and cross sectional studies. The searches should be performed with pubmed.gov or other appropriate search engine.

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- B. Tier 2: Perform search with the pre-specified search terms and add the following limits: Humans, English, Core Clinical Journals and under “Type of Article”: Clinical Trial (included so as to evaluate relevant observational data on subject gained from clinical trials), Multicenter study, comparative study.
- C. Tier 3: If B does not yield sufficient citations, remove Core Clinical Journals from the limits.
- D. Tier 4: If C does not yield sufficient citations, remove all “Types of Articles” from limits (effectively a keyword search limited to Humans and English language publications.)
- E. If D does not yield sufficient citations – either sufficient evidence is not currently available or search strategy needs to be revised.
- F. In addition, the references from recent published guidelines or recent review articles relevant to the clinical question may be scanned for screening of additional relevant articles. Other strategies (such as Google Scholar or another “forward search” that provides articles that have cited the ones identified in the above process.)

Examples:

Using the above strategy (4 a – g) with the keywords acute ischemic stroke thrombolysis yields the following (raw numbers from pubmed – not necessarily all relevant manuscripts):

- Tier 1(Systematic Reviews): 38
- Tier 2: 30
- Tier 3: 53
- Tier 4: 148
- Tier 5: 699

Using the above strategy (5 a – f) with the keyword “Taser” yields the following (raw numbers from pubmed).

- Tier 1: 0
- Tier 2: 2
- Tier 3: 10
- Tier 4: 70

Grading of evidence: The existing CPC process for evaluating the quality of included manuscripts will be used. For each reference identified above assign a grade of evidence using the following scale.

Grade A	Randomized clinical trials or meta-analyses (multiple clinical trials) or randomized clinical trials (smaller trials),directly addressing the review issue
Grade B	Randomized clinical trials or meta-analyses (multiple clinical trials) or randomized clinical trials (smaller trials), indirectly addressing the review issue
Grade C	Prospective, controlled, non-randomized, cohort studies
Grade D	Retrospective, non-randomized, cohort or case-control studies
Grade E	Case series, animal / model scientific investigations, theoretical analyses, or case reports
Grade F	Rational conjecture, extrapolations, unreferenced opinion in literature, or common practice

Then, assign a quality ranking for each above reference using the following scale.

Ranking	Design Consideration Present	Methodology Consideration Present	Both Considerations Present
Outstanding	Appropriate	Appropriate	Yes, both present
Good	Appropriate	Appropriate	No, either present
Adequate	Adequate with Possible Bias	Adequate	No, either present
Poor	Limited or Biased	Limited	No, either present
Unsatisfactory	Questionable / None	Questionable / None	No, either present

An example of this process can be found at the [TASER statement](#).

Recommendation:

The authors should provide a recommendation based on the clinical question in one of the following three categories (please note that the exact phrasing of the recommendation will vary whether a treatment, diagnostic or other type of clinical question is being addressed):

- **Yes**, the clinical question is supported positively by the available high quality evidence.
- **No**, the clinical question is not supported positively by the available high quality evidence or significant high quality evidence exists to the contrary of the clinical question.
- **Neutral**, the available high quality evidence is conflicting and future additional data would be helpful to provide further guidance on this subject.

Timing:

1. The authors shall submit this to the full committee within 90 calendar days. The subcommittee will be provided with an early draft to critique and optimize during this time period.
2. The full CPC will have ten business days to review.
3. After the full CPC returns the document to the authors, an additional ten business days are allowed for the authors to make the requested changes.
4. The final version will be submitted to the board of AAEM.
5. Any paper not completed within 180 days of assignment will be re-assigned at the discretion of the chair of the CPC.

Validity of this methodology:

This methodology is new. Additional study of the performance of this methodology will occur. We plan to examine the performance of this literature search strategy by comparing the overall yield of high quality evidence based on this to existing comprehensive strategies utilized by other medical organizations. The results of this, in combination with feedback from the CPC and clinical advisory authors will lead to further improvement of this strategy as appropriate.

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