

# **Online Data Supplement: Process and Methods Details**

## **ACC/AHA Special Report: Clinical Practice Guideline Implementation Strategies: A Summary of Systematic Reviews by the NHLBI Implementation Science Work Group**

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# 1. Overview of the Process

Directed by National Heart, Lung, and Blood Institute (NHLBI) and with support from the methodology team, the Implementation Science Work Group (ISWG):

- Developed a conceptual framework
- Constructed critical questions (CQ) most relevant to clinical practice.
- Identified (a priori) Inclusion/exclusion criteria for each CQ

Directed by the NHLBI, with input from the ISWG, the methodology team:

- Developed a search strategy, based on inclusion/exclusion criteria and CQ.
- Executed a systematic electronic search of the published literature from relevant bibliographic databases.
- Screened, by 2 independent reviewers, abstracts/full text returned from the search to identify relevant systematic reviews (SRs) and overviews of SRs.

Determined, by 2 independent raters, the quality of each included study.

- Abstracted relevant information from the included studies into an electronic database.
- Constructed detailed evidence tables, which organized the data from the abstraction database.
- The ACC/AHA commissioned an independent methodology team to update the relevant SRs and overviews from 2012 to 2015.

## 2. Search Strategy

The methodology team searched for relevant SRs in the Cochrane Library, PubMed, and other National Library of Medicine sources, such as the Health Services/Technology Assessment Texts and research summaries, reviews, and reports from the Agency for Healthcare Research and Quality evidence-based practice centers. The topics for research include 4 types of interventions: (1) academic detailing (educational outreach visits), (2) reminders, (3) audit and feedback, and (4) pay for performance (provider incentives) as well as guidelines or evidence-based care. The following search terms were used: (*“Education, Continuing”[majr] OR Reminder Systems[majr] OR “academic detailing” OR Reminders OR “educational outreach” OR Decision Support Systems, Clinical[mh] OR “Reimbursement, Incentive”[mh] OR “financial interventions” OR “Pay for Performance” OR “provider incentives” OR “audit and feedback” OR medical audit[mh] OR “medical records” OR “electronic medical record” OR “electronic medical records” OR ehr[ti] OR ehrs[ti] OR emr[ti] OR emrs[ti]*) AND (*Guidelines as Topic[mh] OR Benchmarking OR Comparative Effectiveness Research OR Evidence-Based Practice[mh] OR Evidence-Based Medicine[mh] OR Standard of Care[mh] OR “standard of care” OR “standards of care” OR “Best practice” OR “best practices” OR “evidence based medicine” OR “evidence based intervention” OR “evidence based interventions” OR “evidence based practices” OR*

*“evidence based practice” OR guideline[ti] OR guidelines[ti] AND (Guideline Adherence[mh] OR “guideline adherence” OR Decision Making[mh] OR “decision making” OR Decision Support Techniques[mh] OR Quality Improvement[mh] OR “quality improvement” OR “decision aids” OR “decision aid” OR Implementation OR Intervention[tiab] OR “process improvement”)) AND (systematic[sb]).*

Another search was conducted to identify any additional overviews of SRs using the preceding search terms and replacing the last term “**AND (systematic[sb])**” with the following terms for a total of three additional searches:

1. AND “complex systematic reviews”.
2. Review Literature as Topic [mh] AND complex [tiab] AND systematic [tiab].
3. (review [ti] OR overview [ti] OR overviews [ti]) AND systematic reviews [ti].

Additional resources were obtained from ISWG experts’ referrals and by examining reference lists of reviews obtained through the preceding search strategy.

### **3. Selection Criteria**

SRs and overviews of SRs were included that: (1) had a significant focus on clinical practice guidelines or evidence-based medicine; (2) focused on the implementation of a clinical practice directly affecting patient care; (3) was a provider intervention (versus a patient intervention); (4) included any of the 4 specified interventions (defined below); and (5) assessed knowledge, attitudes, or behaviors related to evidence-based practices.

The following reviews were excluded: reviews that did not focus on clinical practice guidelines; that focused on the implementation of an administrative practice, such as billing or scheduling, or on clinical support services, including lab services, radiology, pharmacy, or access to health records; and that did not focus on the implementation of a clinical practice that directly affects patient care. Reviews were also excluded if they did not include interventions aimed at providers. Also excluded were letters to the editor, editorials, commentaries, testimonies, posters (with the exception of conference poster presentations), brochures, and flyers. The search was limited to English-language resources but not limited to a specific time period.

#### **3.1. Study Design Inclusion Criteria**

Only SRs or overviews of SRs were selected for inclusion. Overviews of SRs are systematic searches for SRs that meet the inclusion criteria; thus, SRs provide the source data on which a review is based. Henceforth “overviews of SRs” are referred to “as “overviews” to better distinguish them from: (a) the subset of SRs based on individual trials, and (b) the full set of included resources referred to as “reviews”.

## **3.2. Types of Interventions**

Four types of interventions were selected for the literature review: provider reminders, audit and feedback, academic detailing or educational outreach, and pay for performance or provider incentives. Following is a summary of how each intervention was defined.

### ***3.2.1. Provider Reminders or Clinical Decision Support Systems***

Provider reminders are tools that may help providers identify patients or members in a population who are in need of some type of intervention and prompt the providers to initiate the intervention. These reminders may be received through:

- Stickers on charts; for example, in one clinic, the placement of a yellow circle sticker on a chart may mean that a patient needs an influenza vaccination
- Vital sign stamps: a reminder that vital signs need to be taken
- Medical or health record flow sheets: a sheet that requires a provider to document each intervention or assessment in the document
- Checklists: a list that enables providers to check off each activity completed, such as taking a blood pressure
- Computerized reminders or alerts: a pop-up reminder to ask about something or check on something; this might be associated with a specific diagnosis or a general reminder to ask, for example, about whether or not a patient feels any pain
- Computer algorithms that require providers to complete a task or fill in information for a task or assessment

Clinical decision–support tools are similar to provider reminders; however, they are often defined in diverse ways. Simply described, they are tools that are intended to help healthcare professionals make optimal decisions at the point of care. They may include computerized alerts and reminders and computerized order sets that help providers select options. Some computerized clinical decision support tools use “hard stops” within an electronic health record, flagging a quality indicator that requires a clinician action or decision. The system will not advance to the next step until the clinician has responded to the prompt.

### ***3.2.2. Audit and Feedback***

Audit and feedback may be referred to as “assessment and feedback” or “monitoring and feedback” by some organizations. Audit and feedback involves monitoring outcomes or compliance with a specific intervention or process. Hard copy or electronic health records are frequently used for audit and feedback because these records are expected to reflect the assessments, interventions, and outcomes associated with care delivery. Such “auditing” involves collecting data or information at the individual clinician or practice level. The “feedback” portion of audit and feedback generally involves the use of reports that are provided to individual clinicians to

let them know how they are doing in relation to others. This may include the use of “control charts” or reports that show how an individual clinician is performing relative to others in the practice or a larger system, such as other providers in the Medicaid program.

For example, a State Medicaid program may review the electronic or hard copy health records of every pediatric patient with a diagnosis of asthma that is enrolled in Medicaid. The record abstractors may have a checklist that is used to see whether a clinician has ordered the appropriate tests at the recommended frequency, has ordered the recommended medications, and has followed other recommended practices.

The percentage of compliance for each measure would then be computed for each clinician. And, the results for a specific clinician are summarized and compared against other anonymous providers.

### ***3.2.3. Academic Detailing***

Academic detailing is a method that involves service-oriented educational outreach. This practice is similar to the “detailing” approach used by pharmaceutical sales representatives to convince physicians to prescribe the medications that they are selling. Academic detailing often involves the following actions or attributes:

- A skilled or similarly educated health professional meets individually with practice clinicians and/or staff to talk about the evidence based practice.
- The educational outreach may involve working with the practice or unit to help them brainstorm how to implement the innovation in a way that does not disrupt efficiency.
- Academic detailing may support improved clinical decision making by fostering one-on-one interaction between physicians and health professionals trained to communicate the latest evidence-based clinical data.
- The goal is to provide accurate, up-to-date synthesis of relevant clinical information in a balanced and engaging format.
- Academic detailing goes beyond providing continuing education.

### ***3.2.4. Pay for Performance or Provider Incentives***

Pay for performance is a strategy aimed at improving health care delivery that relies on the use of market or purchaser power. “Pay for performance” may refer to “financial incentives that reward providers for the achievement of a range of payer objectives, including delivery efficiencies, submission of data and measures to payer, and improved quality and patient safety” (1). However, in some settings pay for performance may also take the form of penalties.

## **3.3. Types of Participants, Populations, Settings, or Outcomes**

The selection of reviews was not limited to those covering any particular setting, outcome, or population. As a result, the settings and type of clinicians included in the reviews and assessed outcomes vary. Studies could

include process of care, clinical effectiveness (i.e., patient outcomes), or other types of outcomes such as cost and utilization and provider satisfaction. Studies that focused solely on patient-mediated interventions, such as those examining patient education or patient reminders, were excluded.

## **4. Reliability Process**

SRs are a type of research study. Therefore, procedures for preventing bias are as important as for other kinds of studies. When conducting this SR, methods were implemented to minimize the introduction of bias at several points in the process:

- Study selection
- Assessment of quality
- Data abstraction
- Synthesis of findings
- Reporting

### **4.1. Study Selection**

Two members of the methodology team independently reviewed and selected citations based on the inclusion and exclusion criteria using the following process:

- Review titles and abstracts to eliminate only those studies that both reviewers agree are clearly not relevant.
- Review the full text of the remaining studies to select studies for inclusion in the SR. The review is included or excluded if both reviewers agree. When the reviewers disagree, they discuss and try to reach consensus. If the reviewers cannot reach a consensus, each gives the rationale for their determination to a third reviewer who makes the decision after reviewing the paper and reviewers comments.
- Each reviewer provides a rationale for each citation that they voted to exclude.

### **4.2. Quality Rating**

The methodology team, in consultation with the NHLBI staff and ISWG, selected the Assessment of Multiple SRs (AMSTAR) tool to assess the methodological quality of SR (2). The scoring of the 11-item AMSTAR tool was scored using ratings established for the NHLBI Adult CVD Risk Reduction Guidelines project:

- Good quality = 11–8
- Fair quality = 7–4
- Poor quality = 3–0

Two members of the methodology team independently scored and rated the quality of each citation selected for inclusion. When the raters disagreed on the rating, they discussed the issue and tried to reach a

consensus. If they could not reach a consensus, a third staff member made the decision after reviewing the paper and raters comments.

Only studies rated “good” and “fair” were included in this report. Studies rated “poor” are excluded.

### 4.3. Data Abstraction

The methodology team developed an electronic abstraction form with data elements pertinent to the inclusion criteria to capture relevant information from the SRs rated “good” and “fair”. Abstractors were trained on the tool using a set of sample articles. Training and abstraction procedures were supported by written abstraction instructions that included: operational definitions for each field; training and practice; opportunities to ask questions; and double abstraction of a subset of items with opportunities for retraining.

An independent reviewer abstracted data from studies rated “good” and “fair”. A second abstractor reviewed 20% of the abstraction for quality control. Discrepancies were handled by discussion and agreement between both abstractor and the reviewer of a revised abstract. Any updates needed were made by the initial reviewer.

### 4.4. Synthesis

Summary evidence tables were developed to characterize the body of evidence for each review in terms of the types of studies included, the quality of included SRs as defined by the AMSTAR score, the range of settings where interventions took place, providers and behaviors targeted by the interventions, types of outcomes measured, and findings of overall effectiveness for all included interventions. Summary tables were constructed separately for SRs and overviews of SRs; descriptive characteristics and main findings were captured in separate summary tables.

## 5. Data Analysis

Similar to Cheung et al. (2012), the results of each SR were reviewed to determine the proportion of studies with positive outcomes regardless of statistical significance (3). As Cheung and colleagues discovered, many of the studies do not reliably estimate the statistical significance of the interventions because of unit of analysis errors. To help simplify the discussion of findings, Cheung’s strategy was adopted, and 3 categories were used to describe the outcomes of the studies included in each review:

1. **Generally effective:** more than two thirds of the studies in a review had positive effects for the intervention
2. **Mixed effects:** one third to two thirds of the studies in a given review showed positive effects for the intervention
3. **Generally ineffective:** less than one third of the studies in a given review showed positive effects for the intervention.

The statistical significance of the effect is not implied in this categorization, given limitations in the underlying data that could be culled from each review. The classification scheme is used simply to provide a sense of the abundance of included studies that showed a positive effect of the included interventions.

## 5.1. Overlap in Reviews

In reviews of SRs, there is always the risk that an included study may appear in multiple reviews and the overlap presents the potential for “double counting” the results from individual studies. The methodology team addressed this potential risk by:

- Answering CQ 1 (process and clinical outcomes) and CQ 2 (cost) primarily by using only SRs where the included studies were clearly referenced and could be checked across reviews and excluding SRs that were updated by more recent reviews.
- For reviews with overlapping studies, we first considered whether counting or not counting the overlap would change the assessment of effectiveness of the interventions in the review.
  - If counting the overlap would not change the effectiveness, we counted the study in both reviews.
  - If counting the overlap would change the effectiveness, we first considered the quality of the reviews, and if the overlapping reviews were of equal quality, counted the study in the most recent review. For example, if a study appeared in a good-quality review and a fair-quality review, we counted the study in the good-quality review and not in the fair-quality review.
  - In SRs that updated a component (i.e., interventions aimed at people with diabetes) of a SR, we counted the studies from the latest review and the studies minus the updated component from the older SR.
  - The overlap was substantial for CQ 3 (barriers) and CQ 4 (facilitators), where SRs were combined with overviews of SRs. However, this overlap was inconsequential since the findings for CQs 3 and 4 were not based on study counts.

## References

1. Agency for Healthcare Research and Quality R, MD. Pay for Performance (P4P). Content last reviewed April 2015. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/pay4per/index.html>.
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3. Cheung A, Weir M, Mayhew A, Kozloff N, Brown K, Grimshaw J. Overview of systematic reviews of the effectiveness of reminders in improving healthcare professional behavior. *Syst Rev.* 2012; 1:36.