Topic Brief: Decision Support Tool Validity

Date: 11/2/2023
Nomination Number: 1021

Purpose: This document summarizes the information addressing a nomination submitted on October 22, 2022 through the Effective Health Care Website (link to nomination**).**
This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: Decision support tools provide timely information to clinicians, patients, and others to inform decisions about health care. The nominators are interested in assessing the effectiveness of decision support tools on clinical and health system outcomes.

Findings: The EPC Program will not develop a new systematic review because the interventions and outcomes were not consistent across studies.

Background

Clinical decision support involves the provision of information to clinicians, patients, and others to facilitate decision-making about health care. Clinical decision information is delivered via electronic (e.g., in electronic medical records) or physical (e.g., written materials) tools, which may include standardized pre-written medical orders for a given condition (order sets), medical recommendations (for medications, imaging or tests), databases of medical information (patient registries to optimize care of chronic medical conditions with best practices?/ care summary dashboards?), preventive care reminders,[1] subtle visual cues such as bolded exclamation point or highlighted text,[2] and alerts. Tools that alert a clinician to possible duplicate tests, for example, may improve efficiency, reduce patient inconvenience, and lower costs. Initiatives have been enacted to increase the use of clinical decision support systems in electronic health record, with the goal of improving quality of patient care.[3]

AHRQ has a Clinical Decision Support Initiative that actively engages clinicians, provider organizations, guideline and quality measurement developers, and information technology professionals in research and outreach efforts to develop agreement around the safe and effective use of Clinical Decision Supports.[1] For Clinical Decision Support to be beneficial, it should provide evidence-based guidance to the patient and clinical care team through the most effective channels (e.g., electronic health records) at the most helpful timepoints.[2] The nominators are interested in the effectiveness and harms of Clinical Decision Supports.

Scope

What is the effectiveness, comparative effectiveness, and harms of decision support tools for health systems, patients, and providers?

Table 1. Questions and PICOs (population, intervention, comparator, and outcome)

Questions	Effectiveness of decision support tools
Population	Health systems, patients, and providers
Interventions	Classic decision support tools (alerts, reminders, order sets/protocols, drug-dose calculations that automatically remind the clinician of a specific action, information about drug interactions, care summary dashboards that provide performance feedback on quality indicators), note templates • Other decision support tools (information retrieval tools (e.g., an "info button" embedded in a clinical information system); knowledge resources (e.g., UpToDate, Epocrates, and MDConsult); artificial intelligence tools (e.g., to aid with diagnosis)
Comparators	TAU; no decision-support tool; other decision support tool
Outcomes	• Clinical (length of stay, morbidity, mortality, health-related quality of life, and adverse events) • Health care process (recommended preventive care, clinical study, or treatment ordered or completed) • User workload and efficiency (user knowledge, number of patients seen, clinician workload, and efficiency) • Relationship-centered (patient satisfaction) • Economic (cost and cost-effectiveness)- cost of decision Support and cost of patient care • Use and implementation by a health care provider (acceptance, satisfaction, use, and implementation) • Diagnostic accuracy • Any harms

Abbreviations: TAU=treatment as usual.

Assessment Methods

See Appendix A.

Summary of Literature Findings

We did not find any systematic reviews matching the nomination. While there were a significant number of primary studies addressing the nomination, they were generally heterogeneous. As a whole, they investigated a wide range of users of decision support tools in a variety of settings and for a variety of conditions. The decision support tools were specific to each study, and the outcome measures were also varied and individualized.

Table 2. Literature identified for each Question

Question	Systematic reviews (5/2020-5/2023)	Primary studies (5/2018-5/2023)
Effectiveness of decision support tools	Total: 0	Total: 37 • RCT: 27[4-30] • Controlled pre-post: 3[31-33] • Non-randomized experimental: 1[34] • Observational: 6[35-40]

Related Resources

We identified additional information in the course of our assessment that might be useful to the nominator. The Community Preventive Services Task Force (CPSTF) is an independent, nonfederal panel of 15 public health and prevention experts who make evidence-based recommendations to improve population health.[41] These recommendations are published on the Community Guide website and include two clinical decision support systems; one which focuses on prevention of cardiovascular disease[42] and one for HIV screening.[43]

See Appendix B for detailed assessments of all EPC selection criteria.

Summary of Selection Criteria Assessment

Decision support tools provide timely information to clinicians, patients, and others to inform decisions about health care. The nominators are interested in assessing the effectiveness of decision support tools on clinical and health system outcomes. AHRQ has a Clinical Decision Support Initiative that attempts to engage clinicians, provider organizations, guideline and quality measurement developers, and information technology professionals in research and outreach efforts to develop agreement around the safe and effective use of Clinical Decision Supports.[1] We did not find any recent, high quality systematic reviews addressing the nomination, and, while we found many primary studies, the interventions and outcomes were generally highly specific to the study and varied widely across studies.

Please see Appendix B for detailed assessments of individual EPC Program selection criteria.

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Appendix A: Methods

We assessed nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for detailed description of the criteria.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Absence of Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years 5/2018-5/2023 on the questions of the nomination from these sources:

- AHRQ: Evidence reports and technology assessments
    - AHRQ Evidence Reports https://www.ahrq.gov/research/findings/evidence-based-reports/index.html
    - EHC Program https://effectivehealthcare.ahrq.gov/
    - US Preventive Services Task Force https://www.uspreventiveservicestaskforce.org/
    - AHRQ Technology Assessment Program https://www.ahrq.gov/research/findings/ta/index.html
- US Department of Veterans Affairs Products publications
    - Evidence Synthesis Program https://www.hsrd.research.va.gov/publications/esp/
    - VA/Department of Defense Evidence-Based Clinical Practice Guideline Program https://www.healthquality.va.gov/
- Cochrane Systematic Reviews https://www.cochranelibrary.com/
- University of York Centre for Reviews and Dissemination database https://www.crd.york.ac.uk/CRDWeb/
- PROSPERO Database (international prospective register of systematic reviews and protocols) http://www.crd.york.ac.uk/prospero/
- PubMed https://www.ncbi.nlm.nih.gov/pubmed/
- Joanna Briggs Institute http://joannabriggs.org/

Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of New Evidence Review

We conducted a limited literature search in PubMed for the last five years, 5/2018-5/2023. Because a large number of articles were identified, we reviewed a random sample of 200 titles and abstracts for each question for inclusion. We classified identified studies by question and study design, to assess the size and scope of a potential evidence review. We then calculated the projected total number of included studies based on the proportion of studies included from the random sample.

While there were results from a search of ClinicalTrials.gov, we did not review these trials since there was such great heterogeneity in the included completed studies. Since we also anticipated

limited value of the topic, we did not think that reviewing the ClinicalTrials.gov output would be an effective use of resources.

Search strategy

Ovid MEDLINE ALL 1946 to May 24, 2023

Date searched: May 25, 2023

1 (Decision Support, Clinical/ or Decision Support, Management/) and (clinic* or hospital$1 or health or healthcare or inpatient$1 or nurse$1 or nursing or outpatient$1 or patient$1 or physician$1 or system*).ti. (6266)

2 ("decision support" and (clinic* or hospital$1 or health or healthcare or inpatient$1 or nurse$1 or nursing or outpatient$1 or patient$1 or physician$1 or system*)).ti. (5231)

3 1 or 2 (8550)

4 limit 3 to english language (8370)

5 4 not (case reports or comment or editorial or letter or news or preprint or published erratum).pt. (7928)

6 limit 5 to yr="2020 -Current" (1795)

7 6 and ((meta-analysis or "systematic review").pt. or (meta-anal* or metaanal* or ((evidence or scoping or systematic) adj4 (synthesis or review))).ti.) (136)

8 limit 5 to yr="2018 -Current" (2714)

9 8 and ((Controlled Clinical Trial or Randomized Controlled Trial).pt. or (control or controlled or random* or trial).ti.) (239)

10 9 not 7 (234)

11 8 and (Evaluation Study.pt. or Observational Study/ or (evaluat* or observational).ti.) (291)

12 11 not (7 or 10) (259)

EBM Reviews - Cochrane Central Register of Controlled Trials April 2023

Date searched: May 25, 2023

1 (Decision Support, Clinical/ or Decision Support, Management/) and (clinic* or hospital$1 or health or healthcare or inpatient$1 or nurse$1 or nursing or outpatient$1 or patient$1 or physician$1 or system*).ti. (364)

2 ("decision support" and (clinic* or hospital$1 or health or healthcare or inpatient$1 or nurse$1 or nursing or outpatient$1 or patient$1 or physician$1 or system*)).ti. (745)

3 or/1-2 (884)

4 limit 3 to yr="2018 -Current" (424)

Value

We assessed the nomination for value. We considered whether or not the clinical, consumer, or policymaking context had the potential to respond with evidence-based change, if a partner organization would use this evidence review to influence practice, and if the topic supports a priority area of AHRQ or the Department of Health and Human Services.

Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes.
1b. Is the nomination a request for an evidence report?	Yes.
1c. Is the focus on effectiveness or comparative effectiveness?	Yes.
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes.
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	The topic is not associated with a particular disease or condition, but initiatives have been enacted to increase the use of clinical decision support systems in electronic health record, with the goal of overall quality improvement of patient care.[3]
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population	Initiatives have been enacted to increase the use of clinical decision support systems in electronic health record, with the goal of improving quality of patient care.[3]
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes.
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Not applicable, as the topic is on general tools to be applied within all of healthcare rather than a specific healthcare issue with associated cost metrics.
3. Desirability of a New Evidence Review/Absence of Duplication	
3. A recent high-quality systematic review or other evidence review is not available on this topic	Yes. We did not find a recent, high quality systematic review addressing the nomination.
4. Impact of a New Evidence Review	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	Not applicable, as the topic is on general tools to be applied within all of healthcare rather than on an issue that would be covered under a guideline.
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	Initiatives have been enacted to increase the use of clinical decision support systems in electronic health record, with the goal of improving quality of patient care.[3] There are no guidelines for clinical decision support systems, which are tailored to healthcare systems, practices, and health conditions.
5. Primary Research	
5. Effectively utilizes existing research and knowledge by considering: - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies)	*Size/scope of review:* 37 studies out of a sample of 200; the estimated size of a systematic review is medium. ClinicalTrials.gov. We did not review the ClinicalTrials.gov output since the heterogeneity in variables such as interventions and outcomes was so great.

Abbreviations: AHRQ=Agency for Healthcare Research and Quality.