Comparative Effectiveness Research Review Disposition of Comments Report

Research Review Title: *Interventions To Modify Health Care Provider Adherence to Asthma Guidelines*

Draft review available for public comment from August 08, 2012 to September 05, 2012.

Research Review Citation: Okelo SO, Butz AM, Sharma R, Diette GB, Pitts SI, King TM, Linn ST, Reuben M, Chelladurai Y, Robinson KA. Interventions To Modify Health Care Provider Adherence to Asthma Guidelines. Comparative Effectiveness Review No. 95. (Prepared by Johns Hopkins University Evidence-based Practice Center under Contract No. 290-2007-10061-I.) AHRQ Publication No. 13-EHC022-EF. Rockville, MD: Agency for Healthcare Research and Quality. www.effectivehealthcare.ahrq.gov/reports/final.cfm. May 2013.

Comments to Research Review

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The tables below include the responses by the authors of the review to each comment that was submitted for this draft review. The responses to comments in this disposition report are those of the authors, who are responsible for its contents, and do not necessarily represent the views of the Agency for Healthcare Research and Quality.

Source: http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1493&pageaction=displayproduct
Published Online: May 19, 2013

Commentator & Affiliation	Section	Comment	Response
Elizabeth Herman(CDCP), Public Review	Executive Summary	Methods: Very detailed description provided about the search strategy, study selection, data abstraction and data management, risk of bias assessment. The procedure for incorporating the multiple domains into the strength of evidence grade (perhaps the most important step) was not as transparent. The report (p ES-7) states that the author of the section first graded the evidence and this was reviewed by the principal investigator. Without a specific algorithm, this process would seem very prone to personal bias, thus negating all the attention to precision paid in the previous steps. Suggest further defining and justifying the approach used to synthesize the information in each domain to reach the strength of evidence grade.	We have revised the text to explain the process and criteria used for strength of evidence determinations.
Elizabeth Herman(CDCP), Public Review	Executive Summary	Results: It would seem that very few of the included studies focused on a single intervention. See p ES-8 "The decision support interventions were often combined with other strategies, including education, reminders, feedback and organizational change". See also p ES-9 ; "Most feedback and audit interventions were part of a multifaceted intervention combined with provider education, prioritized review criteria for audit, benchmarking or comparison with peers or other practices or pharmacy monitoring of fill data and feedback." How then did the authors isolate the impact of decision support or of feedback and audit? How were these interventions different from what were called "multi-component" interventions?	We attempted to determine the predominant/primary intervention for each of these studies—and used that designation to assign the intervention category for each study. We acknowledge that the benefit may or may not be attributed to the right category. We made our best effort to determine if the interventions were classified appropriately. The lack of pre-existing standardized definitions for the interventions we reviewed in this report means that there is an unavoidable risk for misclassification bias of the interventions. Multi-component interventions were those for which there was no clear designation of the primary or secondary intervention in a multi-intervention study.
Elizabeth Herman(CDCP), Public Review	Executive Summary	Results: The definition of organizational change seems quite limited here, referring to the addition of staff. It would be confusing to assign "Low strength of evidence" to the entire range of organizational change. Suggest renaming this intervention to reflect the limited content of the studies reviewed.	We relied primarily on the designation of the authors of each study to determine the type of intervention. So our characterization of "organizational change" is primarily descriptive rather than definitional.

Commentator & Affiliation	Section	Comment	Response
Elizabeth Herman(CDCP), Public Review	Executive Summary	Very comprehensive review of available data on interventions to improve health care provider adherence to guidelines. The results are sobering since the "GAP" between knowledge and putting guidelines into clinical practice are still so wide. Overall - the most disappointing portion of the review is that the authors did not draft suggestions of the type of future studies needed to reduce the GAP. Such statements like "future research is needed" does not move us much farther along. With all the time/effort put into this report, I would think more definitive statements and ideas about the design and outcomes of future studies would be a valulable addition to these reports.	We have revised the report to more definitively state ideas about design and outcomes of future studies that would be valuable additions.
TEP # 1	Introduction	Adequate and clearly written	Thank you
PR #1	Introduction	Perhaps, it might end with a statement that suggests a multi-targetted approach might be best to improve overall care and the best features of the various target approaches should be identified to direct future clinical care. Important goal will be to attempt to standardize care in some ways if possible in order to facilitate communication within the health care system.	We did not feel the existing evidence supported making this sort of statement in the Introduction. Further, we did not feel that the evidence we reviewed could support a clear statement about an advantage of multi-component interventions, and have stated so in the section: Implications for Clinical and Policy Decision Making
PR #2	Introduction	Introduction is generally good; although there might be a bit more discussion about the relative strength of the various components of the guidelines. For example, the guidelines are well grounded in supporting the use of inhaled corticosteroids but it is my impression that there is much less evidence for improvement of clinical outcomes by the use of "action plans."	We have added text to the introduction to reflect this suggestion
PR #3	Introduction	Clear and comprehensive presentation of burden of asthma, guidelines and current practices.	Thank you
TEP #2	Introduction	Acceptable. Discusses the issues with asthma that are important and does state that following the guidelines will improve outcomes. Of course when you select process outcomes, following guidelines will of course improve those.	Noted

Commentator & Affiliation	Section	Comment	Response
TEP #3	Introduction	The authors need to clearly state in the Abstract and Introduction that this is a narrative review of the literature and that no quantitative meta-analysis is performed. This is not stated until page 10 (page 50 of 335) of the report. Current text can potentially be misleading, e.g., the authors state on page 2 (page 42 of 335) that "The interventions in their analyses had been tested between 1976 and 2004 …" The use of the word "analyses" typically suggests a quantitative approach.	This review is a systematic review, not a narrative review of the literature. The fact that we did not conduct meta-analysis does not preclude this report from being a systematic review. We have changed the wording about the cited study.
TEP #3	Introduction	Missed days of school and/or work, quality of life, and parental/patient perceptions/ratings of care are listed under the clinical outcomes category. They are quite different than traditional clinical outcomes listed (symptom days, QOL, ER visits, lung function, etc.) The authors might consider grouping them in a separate category?	Our organizational approach is to list process outcomes together and clinical outcomes together. We do not have an available framework to judge what may or may not be "traditional" and have chosen to retain the groupings as presented.
TEP #3	Introduction	Regarding Figure 1 (page 5; p. 45 of 335), it would be helpful to add bullets to the "Interventions" category to provide detail similar to that provided in the other categories.	We have added the intervention categories.
PR #4	Introduction	The introduction is concise, provides appropriate background to define the problem, and presents a compelling argument for why this study should be conducted. The reference to Cabana et al. was helpful in defining the theoretical framework for why providers do not adhere to guidelines. However, the framework could be expanded to also include the behavior of health care systems. Organizational change, a category of intervention included in the study, attempts to change not only provider behavior but also the behavior of a health care system.	In our discussion of the Cabana reference, we also highlight that there are "external barriers" that contribute to lack of guideline adherence by health care providers.
PR #4	Introduction	Figure 1, which depicts the analytic framework of the study, is very effective. The dashed line on KQ3 may allude to the difficulty establishing the relationship between process outcomes and clinical outcomes in these intervention studies.	Thank you
PR #5	Introduction	Well written, clear justification for paper and methods.	Thank you
PR #7	Introduction	The introduction clearly summarizes past research on this complex issue and effectively makes the case as to the importance of this line of inquiry. The background information clearly leads to the key questions which have the marked potential for expanding our understanding in this area.	Thank you
TEP # 1	Methods	Methods appear adequate	Thank you

Commentator & Affiliation	Section	Comment	Response
PR #1	Methods	This is very well described	Thank you
PR #2	Methods	The methods seem appropriate although I do not understand how "consensus" can be reached among two disagreeing reviewers.	Consensus was obtained by referring disagreements between two reviewers to the larger group of investigators. The wording for this has been revised to clarify this “consensus” methodology.
PR #3	Methods	Inclusion and exclusion criteria are justifiable. Search strategies are explicitly stated and logical. Outcome measurements are appropriate.	Thank you

Commentator & Affiliation	Section	Comment	Response
TEP #2	Methods	The inclusion and exclusion criteria are justified and appropriate. However, I do not think that the determinations of the types of interventions in the studies is correctly identified. For example, the Yawn study---the audit and feedback is identified as the primary intervention but is actually only the introductory portion to enhance interest with decision support tools as the primary outcome. this was not correctly identified. I also reviewed two others ----kattan and lozano and did not think they may have been correctly identified. How was this done----was it reviewed by more than one or two reviewers? This makes a very large difference potentially. I think that these are probably all multiple strategies.	Once the final group of articles meeting inclusion criteria were determined, they were randomly divided and assigned to reviewer pairs. Each reviewer pair assigned the type of intervention and the relevant key question being answered to each study reviewed. Any disagreements between reviewer pairs was resolved by obtaining consensus among the larger group of investigators. Following assignment of each study to an intervention category, each investigator was assigned a group of intervention-specific articles to review. At that stage, an article was re-reviewed for appropriateness of key question and intervention classification; if the article was felt not appropriately classified (by key question or by intervention type), then it was reassigned appropriately based on review by the group of investigators. Where multiple strategies were involved, we have designated this in Table 16. We reviewed as a full team each of the studies noted by the reviewer: Yawn (#3950) – changed to multi-component Kattan (#479) – kept original classification (Decision support) Lozano (#630) -- education primary, organizational change secondary (Note this study is not in main body of the report as it did not report one of the critical outcomes.)
TEP #3	Methods	The inclusion and exclusion criteria and the search strategies are clearly stated. The authors state on page 10 (page 50 of 335) that “Magnitude of effect for studies addressing each outcome was considered as: small (less than 10% change or difference), moderate (10-30% change or difference) and large (over 30% change or difference).” How were these criteria established? No justification or reference is provided for the use of these criteria?	In the absence of national standards to determine magnitude of effect in clinical asthma studies, by group consensus among the investigators, we chose magnitudes of effect that were felt to be clinically meaningful changes.

Commentator & Affiliation	Section	Comment	Response
PR #4	Methods	Inclusion and exclusion criteria are appropriate and justifiable. -Search strategies are explicitly stated and logical. -The outcome measures are appropriate and clearly defined. -The criteria for demonstrating a relationship between process outcome and clinical outcome is not well defined.	We have reworded the document to better explain the criteria used for demonstrating a relationship between process outcome and clinical outcome.
PR #5	Methods	Data synthesis section weak, see 2,3,4 of results section.	We have revised the synthesis section to more clearly explain the findings and their implications.
PR #5	Methods	Table 2 very helpful clear.	Thank you
PR #7	Methods	The methodology appears rigorous in that authors followed key guidelines in conducting a quality systematic review: providing well defined research questions, specific inclusion/exclusion criteria for the studies to be included, exhaustive and comprehensive searching, use of an appropriate data analysis tool, and validation of study selection by at least two reviewers.	Thank you
TEP # 1	Results	Appears comprehensive	Thank you
PR #1	Results	This is comprehensive but admittedly tedious to read. The tables in the evidence report are helpful and there are several attempts to assimilate this complex information.	We have attempted to improve the readability of the document.
PR #2	Results	See general comments on organization of the results section, the relatively less focus on magnitude of response, and my belief that insufficient weight is given to RCTs in the concluding evaluative statement.	We have reorganized the results section. We did incorporate RCTs into the strength of evidence, and therefore into the concluding statement.
PR #3	Results	Results are appropriately detailed given ability of readers to refer to source documents as needed.	Thank you
PR #3	Results	Figures and tables are helpful.	Thank you
TEP #2	Results	The results are clearly stated. The appendices are acceptable but the legends were difficult to find to figure out what SOE meant for example.	We have added the legends

Commentator & Affiliation	Section	Comment	Response
TEP #3	Results	I suggest including the Evidence tables in the text of the review in the Results section (rather than in the Appendix) , as they provide criteria information and detail upon which interpretations and conclusions are made. The current summary tables in the Results section are helpful, but lack sufficient detail regarding the characteristics and contributions of each study. I realize that this is a lot to include, as there are 10 tables, but they provide, in my opinion, the critical evidence summarized in this review. This would enable the use of one list of references instead of the 10 separate lists of references, one for each table, as currently stated.	We have left the evidence tables in the Appendix, but have added more detail to the summary tables
TEP #3	Results	I suggest placing Figure 2 (page 16; p. 56 of 335) in front of Table 4 (page 14; p. 54 of 335), which fits more logically with the order presented in the text. Also Figure 2 and the text state that there are 75 total articles yielding 72 studies, but the text on page 13 (p. 53 of 335) indicates, "Seventy-two articles were eligible for inclusion and 70 addressed one of the critical outcomes and are thus included in the narrative of the report." It would probably be a good idea to footnote this in Figure 1 and identify somewhere in the text the 5 studies that account for these variations.	Figure 2 has been moved up in the text, in front of Table 4.
TEP #3	Results	It would be helpful to provide readers/consumers of this report some examples of "Multimodal" studies in the text and Table 3 on page 13 (p. 53 of 335). A small point, but the footnotes defining SOE and MOE in Tables 8, 9, 10 and 11 could be deleted by putting these abbreviations in parentheses after the appropriate text in the heading for the last column. Also, the authors might consider including citation numbers for the studies included in each analysis in these tables, as well as in Tables 12 and 13 in the Discussion section.	More detailed description of combinations of interventions provided in this section and in the relevant results sections. We have added definitions of SOE and MOE to headings but retained footers, to be consistent with the AHRQ publishing guide. We chose to not include citations in Tables noted as we felt it would limit readability.
PR #4	Results	The results section is clear and has appropriate detail. The tables were well organized and easy to interpret. The information in the appendices was exhaustive. It was surprising that there were few studies investigating interventions classified as organizational change. This type of intervention might be more likely to be published in the grey literature or less likely to have a comparative group.	It is not clear if interventions in this subject area may be more likely to be published in the grey literature. This was already included as a "limitation" in the discussion session, but this point has been expanded. We also added some discussion of the potential shortcomings of categorizing studies by the perceived predominant intervention, and how this may cause lists of studies included in individual categories to appear incomplete.
PR #5	Results	1. Search numbers - do not add up. 4166 citations, 3846 excluded, additional 244 excluded leaves 76 (authors state 72).	We have corrected the final number of included articles

Commentator & Affiliation	Section	Comment	Response
PR #5	Results	Major concern - in results paragraphs for each intervention, the authors report a range of effect sizes. A median effect size would have been very helpful to provide a sense of the distribution. (The median effects and range could also be reported in Table 12.)	There was significant variability in the way in which results were reported (e.g., proportion, odds ratio), so we were precluded from estimating a median effect size. We did highlight the need for standardized measurement methodologies, which would lend themselves to creation of median effect sizes and other summary statistics.
PR #5	Results	Major concern - It is not clear if the range of effect sizes reported is only from those studies with positive results. If this is true, I do not understand why the authors took this approach and it should be well justified. If it is not true, I find it hard to believe that there were no studies with a negative effect. (E.g. decision support, 10/15 studies found positive effect, range from 2 to 17% for RCTs and 2 to 34% for pre-post. If only 10/15 had positive effect, shouldn't range include some negative numbers?) Issue may be related to authors handling of statistical significance versus direction of effect, but this is not clear. It would be very helpful to have this clarified in Data Synthesis section. Information about how percentage changes were calculated should also be included	The range of effect sizes is not only from those studies with positive or statistically significant results—we report all effect sizes provided in the published studies. No calculations were conducted by our group. In the example provided, we indicated that 10 studies had statistically significant results; separately, we provided the range of effect sizes across all 15 studies. If negative numbers had been reported by these studies, we would have reported them.
PR #5	Results	Major concern - For feedback and audit (F&A) comparisons, authors state that many of the studies included other interventions combined with F&A. How were the authors able to establish that F&A was the "predominant intervention"? What is the difference between these studies and "mulitcomponent interventions"?	We have expanded the discussion of how studies were categorized by intervention, and what criteria were used to categorize studies as a “multi-component” intervention.
PR #5	Results	I like the way the authors clearly separated RCT evidence from Pre-post data. It would be interesting to compare the results but this may be beyond the scope of the paper.	Agree that this is beyond the scope of this project—have added this as an area for future study.
PR #7	Results	Results are clearly stated; the tables are pertinent and readable, and the appendices are comprehensive.	Thank you
TEP # 1	Discussion/ Conclusion	Limitations described and clearly delineated. conclusions appear justified	Thank you

Commentator & Affiliation	Section	Comment	Response
PR #1	Discussion/ Conclusion	This is a fairly short discussion from a complex summary of studies. Some thought should be given to assimilating key messages and considering future application of the available information. With those strategies that did show some promise, what were the key features? What types of specific studies should be done? Can one intervention really be effective or will it require a number of strategies that are coordinated to have some impact? I do like the way the framework of evaluation was organized. The categories of process outcomes and clinical outcomes is an important way to conduct an evaluation of outcomes in studies or programs.	We have expanded the Discussion section accordingly to better reflect the complex summary of studies.
PR #2	Discussion/ Conclusion	See above regarding my concern that concluding evaluations may sometimes have been overly positive.	We have attempted to address any concerns for "overly positive" results by using a rigorous strength of evidence evaluation process which would down-grade biased studies that are "overly positive".
PR #3	Discussion/ Conclusion	Implications of major findings are clearly stated but this section could be more fully developed. Policy makers could be given more clear direction about promising approaches to increasing clinician uptake of asthma guidelines. (drawing from what is known from other health areas if need be)	We have further developed the implications of the major findings of this report.
TEP #2	Discussion/ Conclusion	The conclusions are not stated in the same format for all issues. Sometimes it says "against" and other times it says "does not support" but the difference in why these were used is not clear.	Stating there is evidence against something is different than stating that the evidence does not support something. We have clarified text.
TEP #2	Discussion/ Conclusion	The decision to state insufficient does not seem to be consistent throughout. What is insufficient? How many studies and of what strength are required to say other than insufficient.	In the Strength of Body of Evidence section of the report, we explained the criteria for determination of grades of evidence. Included in these determinations were 4 specific factors (risk of bias of included studies, directness, consistency and precision), each of which could contribute to varying degrees the assignment of a grade to a body of evidence. Further, an "insufficient" grade indicates an area where we are unable to make conclusions based on the available evidence.
TEP #3	Discussion/ Conclusion	This section provides a very nice summary.	Thank you

Commentator & Affiliation	Section	Comment	Response
TEP #3	Discussion/ Conclusion	I was a little confused by the citations in this sentence “Of the remaining 23 reviews, we identified 10 reviews as relevant, five of which had some asthma-related outcomes relevant to and included in this review. 42 61 78 92 103 ", as these citations are not for Cochrane reviews?	This section has been reworded to be more clear.
PR #4	Discussion/ Conclusion	The implications and major findings are concise and clear. However, the discussion should refer back to the three key questions and how the study addressed them. Table 15 is well organized. The presentation of the observation alongside the corresponding recommendation for future research is very effective. The discussion makes a strong case that future research should investigate multi-modal interventions. They should also recommend further research of other understudied interventions, such as organizational change.	We have incorporated the Key Questions into the Discussion section, as well as emphasizing further examination of under-studied interventions such as organizational change.
PR #5	Discussion/ Conclusion	Would have liked to see more exploration of why no evidence addressing KQ3	We have provided additional explanations of why no evidence was available to answer KQ3. More specifically: We identified no studies providing evidence on the link between changes in health care provider behavior (health care process outcomes) to changes in clinical outcomes.
Elizabeth Herman(CDCP), Public Review	Discussion/ Conclusion	Discussion: the section on Findings in Relation to What is Already Known (p 43) is unclear. What are What are “relevant Cochrane reviews” and what do you mean by “lack of relevance”? What search terms were used? If this was an attempt to identify the strength of evidence for the interventions reviewed (but as applied to other medical conditions) that should be clearly stated. This would be an important addition to the report as the evidence relating specifically to asthma is very limited.	Reviews that covered provider-targeted interventions and/or asthma were considered “relevant”. We revised the wording to make this more clear.
Elizabeth Herman(CDCP), Public Review	Discussion/ Conclusion	Would urge the authors to further develop the discussion, suggesting priorities, strategies and mechanisms for advancing the knowledge base, i.e. using the report as a “call to action”.	We have further developed the Discussion to include suggestions for priorities, strategies and mechanisms for advancing the knowledgebase.
Elizabeth Herman(CDCP), Public Review	Discussion/ Conclusion	Also consider emerging issues in the discussion. For example, with are the implications of EMRs on decision support tools? Do providers follow them when incorporated into the medical record or circumvent them? Were specific types of audit and feedback particularly promising? For example, is peer feedback valued more than feedback based on administrative data?	We have expanded the Discussion section to consider EMRs and other emerging issues.
PR #7	Discussion/ Conclusion	Implications for future research were clearly stated in a table, and implications for clinical and policy decision making were also offered.	Thank you

Commentator & Affiliation	Section	Comment	Response
PR #3	Future Research	Future research section is clear.	Thank you
TEP #2	Key Question 3	What this appears to be asking is "are the guidelines evidence based and does being evidence based ---usually for efficacy impact effectiveness." Not sure this is relevant for this type of review and not all surprised that you did not find any studies that you think did that.	Key Question 3 (KQ3) was designed to ask if changes in process outcomes were attained with adherence to guidelines, did this translate to improvements in clinical outcomes. We were not certain that we would find studies that addressed KQ3, but we felt that it was important to attempt to link any improvement in process outcomes to clinical outcomes. While we agree that this could be viewed as an evaluation of the evidence for the guideline, this was not the intent.
TEP #2	Key Question 3	I believe that improved control is a patient outcome of significance that is not discussed. Did any of the interventions demonstrate that patient's level of control was improved?	We agree that improved control of asthma symptoms is an important outcome. To ensure standardized assessment of control, we selected two components of asthma control as defined by the NAEEP Expert Panel Report 3, symptom days and rescue use of short acting beta agonists. These data can be found in Appendix E. Our qualitative synthesis was limited to 4 outcomes as described in the section “Data Synthesis.”
TEP # 1	General Comments	Overall, the authors have done a very good job in identifying the target population and addressing the questions	Thank you

Commentator & Affiliation	Section	Comment	Response
PR #1	General Comments	I think this is an excellent review of a very important topic. However, the objective should indicate how the report is to be used, for example, features useful to the application of practice monitoring, specific areas of need for further research, direction research should go to improve outcomes, etc. Overall it is a nice synthesis of the literature available but it should set some direction. I liked some of the conclusions, future directions and clinical implications better in the evidence report than the Executive Summary	Thank you. We have expanded discussion of specific areas of future research with specific examples of future direction of research to improve outcomes. In Table 15 we also added (a) interventions that address time constraints, work flow issues and limited resources and (b) Cost of interventions. Expanded text addressing application of practice monitoring under "Implications for Clinical and Policy Decisions Making" to include testing multifaceted interventions that target high risk patients and cost implications of interventions. In the Executive Summary, we revised the text under "Scope & Key Questions" and added text about clinical implications such as interventions that address the all elements of the asthma care process. We revised the text under "Future Research" in the Executive Summary to include text from the Evidence Report. Revised text to address: (a) types of interventions needed (b) design considerations of standardization of presentation of data and outcome measures and (c) testing interventions that target high risk groups and address cost implications.

Commentator & Affiliation	Section	Comment	Response
PR #2	General Comments	1] The organization of the results is cumbersome. They would be much easier to follow if the major sorting variable was intervention rather than outcome. 2] Magnitude of effect in addition to statistical significance is critical to understanding these data. Magnitude is listed on the data tables but is not always discussed. It is not clear whether conclusions regarding evidence includes an appraisal of magnitude of effect. 3] As the authors point out there were fewer RCTs than crossover studies. I believe, however, they should be given more weight as being closer to a "gold standard" This is of importance as they almost always produced differences which were smaller in magnitude and less likely to be significant. Thus I believe that level of evidence may have been overstated in some cases.	There is a significant amount of data given the number of interventions and outcomes being assessed, so the presentation of the results is likely to inevitably be cumbersome. We organized the results according to outcomes, which we felt stakeholders would perceive as more useful (e.g., based on a given outcome of interest, stakeholders can see the range of interventions available and their impact on that outcome). We have included MOE in our conclusions for each type of intervention. We have attempted to appropriately consider the significance of a variety of elements in each of the studies, including aspects of study design (e.g., risk of bias assessments).
PR #3	General Comments	Report is meaningful for policymakers who want to increase clinician adherence to asthma guidelines.	Thank you
PR #3	General Comments	Key questions are appropriate and explicitly stated.	Thank you
PR #3	General Comments	Not sure if important practical information is lost by the framework for the meta-analysis. For example, inconsistent results in multi component interventions.	We were not able to perform meta-analysis. The limitations of current approach to categorizing interventions expanded in “limitations” section.
TEP #2	General Comments	The questions are explicit and are clinically meaningful.	Thank you
TEP #3	General Comments	Yes to all of the above	

Commentator & Affiliation	Section	Comment	Response
PR #4	General Comments:	This report is an excellent review of interventions to modify health care providers' adherence to asthma guidelines. Well organized and rigorous, the report should serve as a template for future systematic reviews of interventions to improve adherence to guidelines. This review will likely be a very useful resource for designing further studies to improve adherence to asthma and other clinical practice guidelines. The first two key questions are clinically important and unambiguous. The review methods and criteria for these questions were also clearly explained. The third key question is an excellent question, but the wording is slightly confusing. It is clarified later when the authors refer to linking process outcomes to clinical outcomes. Unfortunately the criteria used to determine if a study showed evidence linking a change in provider behavior to changes in clinical outcomes are not clear. The third key question, though difficult to answer, is worth addressing. The evidence from clinical studies cited in the introduction which demonstrate improved clinical outcomes by following asthma guideline recommendations could be more robust. The third key question addresses the overall effectiveness of asthma guidelines and which recommendations are most important. Demonstration of a correlation between a change in provider behavior and clinical outcomes validates specific processes outcomes. The third key question should inform further guideline development and policy decisions regarding their implementation. Establishing a chain of causality between an intervention to change provider behavior with a guideline recommended process outcome and subsequently improved clinical outcomes is very challenging. But interventions which are validated in this rigorous way deserve to be widely implemented. The authors only briefly address key question three in their discussion. They mention in table 15 page 45 the recommendation "develop studies that illustrate how specific changes in provision of care manifest improvements in patient outcomes," but otherwise key question three is ignored. As previously stated, this rigorous review should serve as a template for similar reviews. However, the authors miss a great opportunity to explicitly define how studies should be evaluated for linking process to outcomes, which could serve as a standard for future systematic reviews. Their discussion should also emphasize the significance of key question three and its implications for future research and policy.	We apologize for any confusion regarding the wording of Key Question #3. We tried different ways of wording this question, soliciting input from our Key Informants and Technical Expert Panel, and did not find a simpler way of stating this Key Question. We agree that this is an important question. In the Methods section, we have explained how criteria used to determine if a study showed evidence linking a change in provider behavior to changes in clinical outcomes. We have expanded the Discussion section to further address Key Question #3.
PR #5	General Comments	Important topic, report is well laid out and easy to follow.	Thank you

Commentator & Affiliation	Section	Comment	Response
Elizabeth Herman(CDCP), Public Review	General Comments	Although it is reasonable to organize the findings by type of outcomes, most readers might find the report more user-friendly if the information were organized by intervention e.g. what is the evidence of effectiveness of decision support , looking at the 4 “critical outcomes”	We have considered this alternative organizational approach, and although there are some advantages, we believed that reviewers would prefer to understand how to improve certain asthma care processes and clinical outcomes. We felt that organizing by intervention type would be less intuitive, as planners would first want to decide what outcome they would like to address then select from a range of interventions. We have added a table that organizes results by type of outcomes as well as by type of interventions.
Elizabeth Herman(CDCP), Public Review	General Comments	The executive summary could be more concise. Recommend expanding and highlighting Table B rather than presenting so much detail in the text of the summary about the included studies	It is always a challenge to develop an Executive Summary that is concise yet complete. We have retained the text as we felt it useful for providing context for readers to facilitate their interpretation of the results.
Elizabeth Herman(CDCP), Public Review	General Comments	Thanks for the opportunity to review. We look forward to the next iteration.	Thank you
Elizabeth Herman(CDCP), Public Review	General Comments	Great job on reviewing and summarizing an enormous amount of information	Thank you
PR #7	General Comments	This is an important, well done systematic review that addresses the continuing problem of poor provider adherence to accepted clinical guidelines - which has been identified as a persistent barrier to effective asthma care for the population. Key questions and variables are appropriately stated, the methodology seems consistent with standards for a quality systematic review. The findings are clinically meaningful with implications for individual practices and future research, noting the important potential of interventions that are geared directly toward providers and practice environments.	Thank you
TEP # 1	Clarity and Usability	Overall well done	Thank you

Commentator & Affiliation	Section	Comment	Response
PR #1	Clarity and Usability	The Future Research section seems to portray a story of something missing in past research. This section should give some direction to future work in this area and features of programs that could be important for current care or monitoring of care. There should be some discussion of the six principles of management that are being advocated by the NAEPP. Check the NHLBI/NAEPP website to get this information or communicate with NAEPP. There does not appear to be discussion of health disparities. Perhaps, some thought should be given to specific strategies for certain patient populations. For example, one would not expect to see a significant reduction in exacerbations in a population with a low frequency of exacerbations. The Implications for Clinical and Policy Decision Making section in the Evidence Report is headed in the right direction and should be expanded to address some of the areas previously mentioned. A summary of key points in this section should be included in the Executive Summary. Perhaps some indication should be given to cost of these strategies and how they could be practically applied to health care. Just a few thoughts. I hope they are helpful to improving the value of this very comprehensive study.	In general, Future Research sections are developed by identifying the research gaps from the systematic review. We have expanded the Future Research and "implications for Clinical and Policy Decision Making sections to incorporate these suggestions.
PR #2	Clarity and Usability	See general comments regarding organization of results. The language is clear. Potential usability is limited by lack of cost-effectiveness data. If no data are available the importance of the issue should at least be recognized.	Costs and implementation issues were beyond the scope of this review. However we would agree that these are important considerations for decisionmakers.
PR #3	Clarity and Usability	Report is well structured and organized. Conclusions can be used to inform policy and practice....but implications could be stated more strongly.	We have revised the Conclusions to state the implications more strongly.
TEP #2	Clarity and Usability	There are spelling and spacing errors that I assume will be fixed.	These have been reviewed and addressed.
TEP #2	Clarity and Usability	Since so many things are insufficient it will be difficult to use this report for clinicians. May be helpful for researchers to know what questions have not been addressed.	The insufficient grade was primarily for studies evaluating missed school/work. It is a knowledge gap for future researchers to address.
TEP #2	Clarity and Usability	Giving equal weight to process and clinical outcomes seems inappropriate.	We do not know of a consensus by any national body to determine whether process or clinical outcomes should be weighted more. We imagine that each may be equally or differentially more important depending on who the stakeholder is.

Commentator & Affiliation	Section	Comment	Response
TEP #2	Clarity and Usability	Why was prescribing of a peak flow included? There is no data that I am aware of to say prescribing a peak flow meter improves anything related to asthma.	We sought to include process behaviors suggested as "standard of care" by various national and/or international asthma guidelines. Measuring peak flow is one approach to assessing lung function that is included in the most recent NAEPP EPR-3 guidelines.
TEP #3	Clarity and Usability	Please see previous comments and suggestions re: organization and clarity.	
TEP #3	Clarity and Usability	While the conclusions can potentially be used to inform policy and/or practice decisions, the limitations and discussion noted by the authors that limited their review to a narrative summary (with no quantitative meta-analysis) provide a very useful guide for future research needs.	Thank you for comment. We do not agree that this report is a narrative summary. Although we were not able to perform quantitative synthesis (meta-analysis) of the evidence, we performed qualitative synthesis.
PR #4	Clarity and Usability	This report is an excellent review of interventions to modify health care providers' adherence to asthma guidelines. It could potentially direct policy decisions regarding funding of research for interventions to affect health care provider and health care system behavior. Furthermore, the report may be an important resource for researchers designing further studies to improve adherence to asthma and other clinical practice guidelines. The strategies identified as being effective should receive funding for implementation. This report should also inform updates of asthma guidelines. Mature, complex, well funded guidelines such as NAEPP need to not only provide clinical recommendations but also guidelines for their implementation.	Thank you
PR #5	Clarity and Usability	For me, it is difficult to interpret findings without reporting of a median effect or some type of central tendency.	While we agree that a median effect or some type of central tendency would undoubtedly facilitate interpretation of the findings, the heterogeneity in study measures precluded our ability to carry out a quantitative synthesis.
PR #7	Clarity and Usability	While lengthy and comprehensive, the report overall was well structured, organized and highly readable.	Thank you

Abbreviations: PR=Peer Reviewers, TEP=Technical Expert Panel Member