Comparative Effectiveness Research Review Disposition of Comments Report

Research Review Title: *Pressure Ulcer Treatment Strategies: Comparative Effectiveness*

Draft review available for public comment from June 06, 2012 to June 27, 2012.

Research Review Citation: Saha S, Smith MEB, Totten A, Fu R, Wasson N, Rahman B, Motu'apuaka M, Hickam DH. Pressure Ulcer Treatment Strategies: Comparative Effectiveness. Comparative Effectiveness Review No. 90. (Prepared by the Oregon Evidence-based Practice Center under Contract No. 290-2007-10057-I.) AHRQ Publication No. 13-EHC003-EF. Rockville, MD: Agency for Healthcare Research and Quality; May 2013. www.effectivehealthcare.ahrq.gov/reports/final.cfm.

Comments to Research Review

The Effective Health Care (EHC) Program encourages the public to participate in the development of its research projects. Each comparative effectiveness research review is posted to the EHC Program Web site in draft form for public comment for a 4-week period. Comments can be submitted via the EHC Program Web site, mail or email. At the conclusion of the public comment period, authors use the commentators' submissions and comments to revise the draft comparative effectiveness research review.

Comments on draft reviews and the authors' responses to the comments are posted for public viewing on the EHC Program Web site approximately 3 months after the final research review is published. Comments are not edited for spelling, grammar, or other content errors. Each comment is listed with the name and affiliation of the commentator, if this information is provided. Commentators are not required to provide their names or affiliations in order to submit suggestions or comments.

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/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=1491
Published Online: May 8, 2013

Commentator & Affiliation	Section	Comment	Response
Reviewer: 1	General/Overall Comments	Outstanding and comprehensive and detailed review of pressure ulcers	Thank you for your comment and positive feedback. We appreciate your review of our draft report.
Reviewer: 2	General/Overall Comments	So overall I think the group did a fantastic job. they seemed terribly focused on worrying about bias in reporting and in the desire to be truly comprehensive it seemed to me that they provided too much information about studies that were probably not worth reporting on. I would recommend making some clear definitions that only studies of _____ number or some level of power were included. Otherwise I fear people will look ... see evidence and not look back at the quality of the study being poor and the sample N=10.	Thank you for the positive feedback and comments on the draft report. We included studies that met the predefined inclusion criteria established in our review protocol. Regarding the quality of the studies, we agree that there were many studies of poor quality and/or small sample size but we included them if they met the predefined inclusion criteria. For all included studies, we carefully assessed these and other predefined quality criteria. The results of our quality assessments are reflected in our Summary of Evidence findings (Table A of the ES and Table 31 of the main report), and additional details of the quality rating assessment are presented in Appendix G.
Reviewer: 3	General/Overall Comments	The report is clinically meaningful given the importance of the problem and the challenges that healthcare providers face when treating pressure ulcers. The target population is stated; however, the patients are very heterogeneous as noted by the authors (younger, spinal cord patient and older, frail nursing home or hospitalized patients). Thus, it may not be clear if the results and conclusions apply to one or both groups. This is an inherent challenge with this work; however, if the results apply to one group, it should be stated.	We appreciate that the effectiveness and harms of pressure ulcer treatments may vary by patient populations and attempted to address that issue in KQ 1b and 2b. Evidence about differential effectiveness and harms by patient characteristics, however, was limited.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	General/Overall Comments	The key questions really are the ones that clinical providers face each time they see a patient with a pressure ulcer. What is the nutritional plan? What is the pressure reduction plan? What type of wound dressing is appropriate? Should I consider an adjunctive method to treat the wound? The authors addressed those fundamental questions looking at the evidence. I came away after reading the report that the authors had spent the time researching the questions. Based on this document and others, I agree with their conclusions.	Thank you for this comment.
Reviewer: 3	General/Overall Comments	Overall concerns: Lack of discussion on repositioning: In reading the report, repositioning was one key region that I think merits some discussion. The authors explained in the introduction why they did not review repositioning; however, I think this is an important topic. Given the nursing time that is required (which requires FTE), it should be discussed. We recognize the literature is very sparse in this area. The Cochrane group reviewed this in 2009 and did not find any RCTs on the topic (Moore 2009). If there is no literature on repositioning, than the report should reflect this lack of information.	We agree that repositioning is an important aspect of pressure ulcer treatment. We considered reviewing the literature on repositioning, but in developing the scope of the report, our key informants felt that focusing on the other modalities we reviewed was more important, and that repositioning should not be a focus of the report. We have added a comment explaining this in our Methods section, under Interventions and Comparators.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 4	General/Overall Comments	The report is clinically meaningful, the target population is defined, but the audience is not. My understanding was that this report was produced to support development of a clinical practice guideline for primary care and medical specialists, but certainly the audience could be broader.	We developed our review to provide evidence that might be useful to clinicians, policymakers, patients, and other decision makers interested in pressure ulcer treatment. We have added this statement to the Applicability section of our Methods.
Reviewer: 4	General/Overall Comments	The Key Questions are appropriate and explicit. However, I think that the outcome measures other than complete wound healing that were used as indicators of benefit need to be described in the Methods section. For example, the PUSH tool scale should be described, and its validity discussed. That particular tool combines surface area (a continuous outcome) with two categorical outcomes (for exudate and tissue descriptions) into a score, which probably shouldn't be treated as a continuous outcome, and may not be more useful than wound surface area alone. Few tools have been examined in a rigorous way for their ability to predict complete healing.	We appreciate this input about composite outcome measures and have added a statement about their use to the Outcomes subsection of our Scope and Key Questions section.
Reviewer: 5	General/Overall Comments	The area of treatment strategies for pressure ulcers is increasingly important for hospitals, nursing facilities and home care programs. Issues of cost, multi-drug resistance, and readmission are only increasing in importance.	We agree that there are many issues related to pressure ulcer treatment that are important. For this report, we focused primarily on clinical outcomes, particularly wound healing.
Reviewer: 5	General/Overall Comments	The target population and audience are well defined. The key questions are meaningful.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 6	General/Overall Comments	This is an extremely throrough review of studies from 1985 to 2011. Although there were no substantial new findings compared to the systematic review by Reddy et al in 2008, the review has value for those attempting to keep up with the literature regarding pressure ulcer treatment and for the design of research studies that will improve the evidence.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.
Reviewer: 7	General/Overall Comments	The report is very useful and particularly points out the lack of high quality studies that allow for strong conclusions about care. Also, it was useful to have clarity brought to the issue of a lack of common outcome data sets and expectations.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.
Reviewer: 8	General/Overall Comments	The report will be meaningful to clinicians, it reads clearly, is comprehensive and addresses major areas of pressure ulcer treatment evidence that practitioners apply in their practice with care of patients with pressure ulcers. The key questions and methods used to evaluate the literature are described with enough detail for the reader to feel this was a well and carefully done review.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.
Reviewer: 9	General/Overall Comments	The report is clinically meaningful, the target audience and population are defined and the questions and explicitly stated and appropriate.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	General/Overall Comments	The report is clinically meaningful. The target population and audience are clearly defined. The key question is appropriately and explicitly stated: To summarize the available evidence comparing the effectiveness and safety of treatment strategies for pressure ulcers.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.
Reviewer: 10	General/Overall Comments	One comment about terminology used in this Systematic Review (SR): Author's page 8, Line #19 (Inclusion/exclusion cirteria section) - the use of the term decubitus ulcer is very outdated and perhaps authors should consider the newer terminology of pressure ulcers and stay consistent with this term throughout the paper.	Thank you for your comment. We agree that the terminology is outdated and have removed this term from our report.
Wound Ostomy & Continence Nurses Society (WOCN)	General/Overall Comments	The document provided an in depth and well organized review of the literature. The search questions addressed relevant treatment topics. The search strategy appears reasonable and feasible with appropriate inclusion and exclusion criteria. A reasoned approach was utilized to rate the studies and establish the level of evidence for the findings.	Thank you for your comment and positive feedback. We appreciate your review of our draft report.

Commentator & Affiliation	Section	Comment	Response
NPUAP	Abstract	NPUAP recognizes that this document is still in draft format-some of the comments are likely editing-related. There is a concern, however, that the results in the Structured Abstract/Executive Summary will be highlighted without the significant caveats that are presented regarding strength of evidence. For example, if there is only low strength evidence that wound healing is similar with collagen compared to standard care dressings, AHRQ's own definition suggests that there is low confidence that this evidence reflects the true effect and that further research is likely to change the confidence in the estimate of the effect. A conclusion of 'further research is warranted' for the areas with low confidence might convey the message more accurately.	We agree that the fact that there was low-strength evidence for many findings warrants a conclusion that further research is needed. We have included that statement in our Conclusions section of the abstract, executive summary, and full report.
NPUAP	Abstract	Evaluating the effectiveness of support surfaces for treating pressure ulcers by combining results from distinct studies is hindered by a number of factors including variability among products with similar features (e.g. Low air-loss). Mechanistically, support surfaces affect pressure ulcer treatment by redistributing pressure away from the injured site and creating a microclimate that does not adversely affect the healing process. Low air-loss is a feature of a support surface "that provides a flow of air to assist in anaging the heat and humidity (microclimate) of the skin."	We categorized the surfaces by the name or feature used by the researchers in the articles and in other systematic reviews in order to facilitate comparisons. As they refer to low-air loss beds/devices and compare this feature against others, we used this terminology. We have revised the text to clarify what is compared in each study.

Commentator & Affiliation	Section	Comment	Response
		(NPUAP-EPUAP Clinical Practice Guidelines, 2009). Notice that the term “low air-loss” refers to a feature and not a category of product. Clearly, if a bed only provided flow of air to the skin without redistributing pressure it would not be an effective support surface. Therefore, the extent to which a surface with low air-loss affects healing is almost certainly also related to how the surface redistributes pressure. A study to isolate the effect of the low airloss feature would need to be conducted on the same mattress with and without the air escaping through the cover. There is no such study in the literature. The statement in the structured abstract on page v that reads, “there is no overall benefit to low air-loss beds compared to standard foam mattresses” is potentially misleading because the small number of studies conducted did not control for the additional factor of pressure redistribution. Therefore, there is insufficient evidence in the literature to compare surfaces with low air-loss features to foam mattresses without low air-loss features. The statement in the structured abstract on page v that reads, “different mattress brands are comparable in performance “ is unclear. Does “different mattress brands” refer to only support surfaces with air-fluidized features or all support surfaces? Or, does it follow from	

Commentator & Affiliation	Section	Comment	Response
		the second key point on page 17 referring to alternating pressure beds? If it is the latter, this is a potentially misleading broad generalization.	
Reviewer: 9	Executive summary	Page 27, line 36, should this read "did not describe harm"	Thank you. This error has been corrected.
Reviewer: 9	Executive summary	In page 6, line 18 the search is up to August 5 2011, whereas in page 31, line 55 is says studied published through September 14 2012	Thank you. This error has been corrected.
Reviewer: 9	Executive summary	Page 32 line 15 should read, supported bu a low strength of evidence	Thank you. This error has been corrected.
Anonymous comments based on American Association of Wound Care (AAWC) Guidelines	Executive summary	ES-2: The NPUAP staging system displayed is outdated.	We have changed references to the NPUAP staging system to reflect the most recent version.

Commentator & Affiliation	Section	Comment	Response
Anonymous comments based on AAWC Guidelines	Executive summary	ES-4: Please consider adding Preventing Ulcer Infection as an outcome. Infections in pressure ulcers as well as other acute and chronic wounds delay healing and add to the resource and cost burden of wound care even if they do not cause sepsis.1 A meta-analysis which included pressure ulcer controlled studies reported that wound infection incidence is reduced from 7.6% using gauze-based topical wound dressings to 3.2% using "occlusive" hydrocolloid, film or hydrogel dressings ($p< 0.001$).1 This result not included as a reference may affect the "Harms" conclusion on page ES-18.	We included infection in our review of harms. We admit that it is difficult to know if infection should be considered a harm or benefit (infection prevention). In most studies reporting infection rates, they are simply reported for each intervention, usually in the section on adverse outcomes. It is typically not possible to know if infections were prevented by or caused by the dressings (or neither). We have therefore chosen to leave infection in the harms category. The Hutchinson meta-analysis includes few pressure ulcer studies. In accordance with our protocol, we considered evidence only from studies of pressure ulcers and therefore have not included these findings in our report. Results from pressure ulcer studies within that review that met our inclusion criteria are reported.
Anonymous comments based on AAWC Guidelines	Executive summary	ES-8: According to the study design inclusion standards, no bona fide statistically sound meta-analysis of evidence is included in this analysis. This seems to omit compelling evidence which is at odds with the conclusions of this work: a. "Our systematic review provided only weak levels of evidence on the clinical efficacy of modern dressings compared with saline or paraffin gauze in terms of healing, with the exception of hydrocolloids." 2 b. "Twenty-nine publications, dealing with 28 different studies, met the inclusion criteria and were included in the review. Hydrocolloids were most frequently used on pressure ulcers grade 2–3. Concerning the healing of the	As mentioned above, we did not include summary findings from studies or reviews that combined results for different wound types without providing separate results for pressure ulcers. We evaluated other systematic reviews of pressure ulcer treatments as part of our review process. Our review was commissioned in part due to concerns about the rigor, comprehensiveness, and quality of other reviews. In addition, the questions posed and inclusion/exclusion criteria used by other reviews may have been different from ours. We therefore used other systematic reviews to find original studies for our review, and to contextualize our findings.

Commentator & Affiliation	Section	Comment	Response
		pressure ulcer, hydrocolloids are more effective than gauze dressings for the reduction of the wound dimensions. The absorption capacity, the time needed for dressing changes, the pain during dressing changes and the side-effects were significantly in favour of hydrocolloids if compared to gauze dressings."3 c. One meta-analysis4 of 281 pressure ulcers dressed with one hydrocolloid dressing, 136 dressed with another and 102 dressed with saline gauze reported significantly ($p<0.05$) more pressure ulcers completely healed using the 281-subject dressing as compared to gauze at 8, 10 and 12 weeks, with 51% of gauze-dressed subjects healed at 12 weeks compared to 61% of the highperforming hydrocolloid dressing. A slightly lower percent of subjects healed with the other hydrocolloid dressing healed compared to those dressed with saline gauze, suggesting variability within the category of hydrocolloid dressings. i. Percents healed at 12 weeks using mainly the high-performing hydrocolloid dressing implementing a content-validated standardized protocol of pressure ulcer care were replicated in multiple settings in a cohort of 507 pressure ulcers.5 d. Joint analysis of six studies comparing hydrocolloids to gauze6 reported that hydrocolloid primary dressings significantly improved pressure ulcer healing rates	

Commentator & Affiliation	Section	Comment	Response
		compared to conventional gauzetreatments with 7 patients needed to treat to reveal benefit (95% conficence interval 4- 16). In the same review, analysis of 5 studies reported a significant favorable hydrocolloid effect on pressure ulcer healing time.6	
Anonymous comments based on AAWC Guidelines	Executive summary	ES-11: Performing meta-analysis only on healing outcomes may not be in patients', professionals' or institutions' best interests. Wound infection and patient-reported pain are reliably measured, economically important aspects of pressure ulcer management, both capable of rigorous metaanalysis. 1 7	As mentioned above, we included only studies of pressure ulcers. We examined infection and pain as outcomes when reported. They were not reported consistently or commonly enough to meta-analyze for any given intervention comparison.
Anonymous comments based on AAWC Guidelines	Executive summary	ES-14: Based on 4.a,b,c above, please consider elevating level of "Hydrocolloid compared to conventional dressings" to "Moderate". These are all bona fide, statistically sound meta-analyses which have added clinically important findings to the literature not addressed in the CER.	Please see responses to comments above.

Commentator & Affiliation	Section	Comment	Response
Anonymous comments based on AAWC Guidelines	Executive summary	ES-18: The first row under "Harms…" labeled "Dressings and Topical Therapies. Harms often result from failure to use dressings as prescribed. For example "moist gauze" needs to be changed or remoistened every 4 hours. If this is not done, it dries and adheres to pressure ulcer tissue8 . Hydrocolloid dressings are not indicated for daily dressing changes. The CER would serve users well to review the moderate evidence of harms to verify which dressings were associated with the harms and whether they were being used according to package insert instructions when eliciting the harm.	We did review evidence on harms and included such evidence as available from the reviewed studies. We did not find any reports in the studies we reviewed of whether dressings were being used according to manufacturer instructions.
Anonymous comments based on AAWC Guidelines	Executive summary	ES-18: The second row under "Harms…" labeled "Dressings and Topical Therapies (perhaps distinguish it from first such row: seems odd to address different issues but have same name). The meta-analysis of infection differences seemed compelling evidence of gauze harm to all chronic and acute wounds. Having the CER group perform its own meta-analysis of effects of gauze vs the same occlusive dressings1 on clinical infections in pressure ulcers as defined by the classic clinical signs/symptoms may add value to this CER.	The labels refer to the intervention categories and there were two conclusions for this intervention category so we have retained the "Dressings and topical therapies label for both of these statements". As mentioned above, we included only studies of pressure ulcers. We examined infection and pain as outcomes when reported. They were not reported consistently or commonly enough to meta-analyze for any given intervention comparison.

Commentator & Affiliation	Section	Comment	Response
Anonymous comments based on AAWC Guidelines	Executive summary	ES-22: Maceration is a questionable “harm” as Eriksson et al. have reported that wounds heal perfectly well submerged in fluid. Many cannot discriminate new white epithelium at the wound edge from “macerated” tissue except by waiting two days to see if turns pink, indicating that it was and is epidermis.	We appreciate that maceration may or may not be considered an important adverse effect. We included it because many studies reported it as a harm, and in the interest of providing that information to readers of our review for whom that outcome might be relevant.
Catherine Ratliff	Executive summary	Nice job	Thank you, we appreciate the feedback.
James Adamson	Executive summary	Does not include unstageable and suspected deep tissue injury definitions	We have revised our figure and descriptions of the NPUAP stages.
Laura Bolton	Executive summary	This is a phenomenal piece of work; I am conscious of the effort that underlies such an undertaking and congratulate the review board for producing such a comprehensive document. However, I do believe that one or two of the conclusions are either unsupported and/or misleading; I have explained in more detail in below and also uploaded reference materials where appropriate. Thank you.	Thank you. We respond to individual comments below.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Executive summary	Claims for Air fluidized beds (AF) The executive summary concludes that there is 'evidence of moderate strength that air fluidized beds are superior to other support surfaces' (ES-21) and that 'greater investment is warranted in this technology' (ES-24). I believe the studies presented have been selected, extracted and summarised in such as way as to reach an invalid conclusion regarding both effectiveness and costeffectiveness of air fluidized beds. To conclude a 'moderate strength of evidence' (p17) is difficult to understand on many different levels: a) The inclusion of weak and obsolete supporting literature (1x good, 3x fair and 1x poor study).	The text has been revised to remove the statement about investment which was from another source and included by mistake. We also clarify the basis for the assessment. Moderate strength of evidence is based on several criteria, of which the quality of the studies is one. Lastly, we address the issue of poor quality and potentially outdated literature in the comments above. For Support surfaces we included all studies that could be identified. Unfortunately, there was not more current literature.
Laura Bolton	Executive summary	b) A recognition that basing conclusions on studies which are rated as 'fair' or 'poor', leads to 'significant flaws that imply bias that might invalidate the results' (p.ES10; 11). c) The 'balance of costs and potential harms of [AF] technologies against the other benefits is unclear' (ES- 26). d) Other well-respected authorities such as NPUAP (the strength of evidence does not support prescriptive recommendations), NICE (UK) and recent systematic reviews (McInnes) have failed to reach the same conclusion.	We compare our results to the systematic review by McInness, 2011, which also reports some evidence that AF beds lead to reduction in size of PUs. We did not include professional association recommendations in our review, rather we provide the review so it can be used by others to make recommendations. We revised our text so that it does not make recommendations, rather it summarized the studies and points out their strengths and weaknesses.
NPUAP	Executive summary	Use of the term vacuum-assisted closure (ES-2) instead of Negative Pressure Wound Therapy (NPWT) is confusing.	We have changed vacuum-assisted closure to NPWT.

Commentator & Affiliation	Section	Comment	Response
NPUAP	Executive summary	ES-13 Table A Key Outcome is listed as Alternating pressure beds but the conclusion relates to alternating pressure chair cushions.	We have revised the formatting of Table A to correctly list this outcome.
Hill-Rom	Executive summary/Conclusions	*Relevance of Studies Relied Upon by AHRQ* The conclusion drawn that "there is no evidence of differences in outcomes with LAL beds compared with foam surfaces (three of four studies), or with LAL beds compared with LAL overlays" (Table A, p. ES-14) seems overly broad for a review based on four studies from 1994 and earlier, three of which evaluate surfaces from the same manufacturer (KCI), and two of which use the same surface (TheraPulse). The remaining study is based on a product that is no longer commercially available (Monarch) and not representative of the LAL market today, much less current microclimate management technology. Since 1994 many new wound surfaces have entered the market place providing enhanced capabilities for treating pressure ulcers. Your conclusions here, at a minimum, should have called for an expanded review, which included products more recently introduced to the market.	We agree that more research is needed and we clarified in the final report that much of available evidence has limitations, including the fact that it is dated and/or that the comparator is not ideal. However, a systematic review requires that conclusions be based on the available evidence and what is available is consistent. The need for more or better research is part of the discussion of applicability and future research needs.

Commentator & Affiliation	Section	Comment	Response
NPUAP	Executive summary	ES-19 and the Key Points (p. 78) related to surgery for pressure ulcers cite independent variables- for example 'Sacral ulcers have lower recurrence rates after surgery than ischial pressure ulcers.' The location of the ulcer, whether or not the patient has a spinal cord injury, and whether or not bone debridement is done during surgery are defining characteristics of the patient's wound.	We have placed these comments under the appropriate key questions. We considered ulcer location and bone involvement to fall under KQ 1a (characteristics of ulcers), and spinal cord injury to fall under KQ 1b (patient characteristics).
NPUAP	Executive summary	ES-22 cites the review by Reddy (2008) as being the most current, comprehensive evidence about the effectiveness of pressure ulcer treatments. This analysis and recommendations had a concerning degree of selection bias created by limiting reviewed studies to randomized, controlled trials. Not all treatments or interventions are appropriate for this type of study.	We have added a comment to our Discussion section about the expanded scope of our review compared to the review by Reddy et al.
Reviewer: 1	Introduction	Same as above	Thank you for your comments.
Reviewer: 2	Introduction	was helpful and provided sufficient information about what was done.	Thank you for your comments.
Reviewer: 3	Introduction	The introduction is well thought out and well written. The authors did an excellent job of outlining some epidemiology, pathology and current standards of care for pressure ulcer treatment. In itself it does a fine job of outlining the issues. Referencing the NPUAP and showing the staging is important. The authors did a very nice job of outlining the key questions and the rationale for the questions.	Thank you, we appreciate your comment and the feedback.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	Introduction	Weaknesses: It is common to report the ranges of pressure ulcers for incidence depending upon study; however, with such wide ranges, the readers do not get a full feel of the scope of the problem. Is it close to zero or is it in the teens? A commonly accepted number might help frame this for us. Second, a comment on whether this has changed over the years might also be helpful. (page one) If the incidence or prevalence has not changed, it would be concerning.	We have added data on estimated prevalence from international prevalence surveys, including trends over time. Citation: Vangilder C, Macfarlane GD, Meyer S. Results of nine international pressure ulcer prevalence surveys: 1989 to 2005. Ostomy Wound Manage. 2008;54(2):40-54. PMID: 18382042.
Reviewer: 3	Introduction	A few further comments on why pressure ulcer treatment is important to providers will also help raise the level of importance of this work. Pressure ulcers are considered quality metrics for long term care. They are a frequent source of medico-legal issues. In some states, worsening pressure ulcers are considered reportable to the state. Most readmissions for pressure ulcers will not likely be paid for in the future. Some comments on these common issues may strengthen the argument. (page one)	We have added comments in this regard, as suggested.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 4	Introduction	Shear forces are thought to be important contributors to deep tissue-level pressure and development of pressure ulcers. I'd suggest you add this to the background section. Here are a couple of references you might consider, but I am sure there are others. Lahmann NA, Tannen A, Dassen T, Kottner J. Friction and shear highly associated with pressure ulcers of residents in long-term care - Classification Tree Analysis (CHAID) of Braden items. J Eval Clin Pract. 2011 Feb;17(1):168-73. doi: 10.1111/j.1365-2753.2010.01417.x. Epub 2010 Sep 12. Department of Nursing Science, Charité- Universitätsmedizin Berlin, Berlin, Germany. nils.lahmann@charite.de *Ceelen KK, Stekelenburg A, Loerakker S, Strijkers GJ, Bader DL, Nicolay K, Baaijens FP, Oomens CW. Introduction Compression-induced damage and internal tissue strains are related. J Biomech. 2008 Dec 5;41(16):3399-404. Epub 2008 Nov 17.	We appreciate the comment and references. We feel this is more relevant to the companion review our center is conducting on prevention of pressure ulcers, "Pressure Ulcer Risk Assessment and Prevention: A Comparative Effectiveness Review." The draft of this report is available on the AHRQ web site at: http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=926&pageaction=displayproduct
Reviewer: 4	Introduction	You chose not to reference "Suspected Deep Tissue Injury" from the NPUAP 2007 classification – was that because you did not find studies referencing this "stage" or some other reason?	We have changed the figure and descriptions of the NPUAP staging system.
Reviewer: 5	Introduction	Useful, concise summary	Thank you, we appreciate your comment and the feedback.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 6	Introduction	As this is likely to be read by persons not familiar with wounds, the photos on ES-2 should be of improved quality	Thank you for your suggestion. For the draft submission of the report we used place holder photos because we were awaiting copyright approval from NPUAP to use the images. We have received the copyright to use the high resolution images and these have been added to the final report.
Reviewer: 7	Introduction	Clear and concise with so much information to vet. Figure C, the analytic framework was very helpful in outlining the owrk to follow. The key questions were well worded and were addressed in the body of the work.	Thank you, we appreciate your comment and the feedback.
Reviewer: 8	Introduction	In the Executive Summary introduction the NPUAP stages of pressure ulcers are described. The authors have included four of the stages that are in the NPUAP classification system. There are also 2 other categories in the latest version, unstageable, and suspected deep tissue injury. Why were the staging categories limited to the four and not the whole of six? These should be included as part of the evaluation and staging system to be accurate and complete and if not specifically used in the evaluation of studies that can be explained. At many clinical facilities these additional categories are used and familiar to clinicians with wound/pressure ulcer expertise.	We have changed the figure and descriptions of the NPUAP staging system.
Reviewer: 9	Introduction	In the background, there need to be more updated information pertaining to the impact of pressure and shearing forces on the capillaries, interstitial spaces ad the cells. The effects are not just related to ischemia	We have added shearing to the list of contributors to ulcer development.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Introduction	First, I applaud the authors for taking on this massive project! Second, I would like to acknowledge that to summarize such a wealth of knowledge is a daunting task and there is likely no "one way" to present the summary data that will meet the needs of all of the target audience. That being said, I am presenting my critique with the mindset that some of these issues I raise or suggestions I make will somehow improve the overall refinement of the document.	Thank you, we appreciate your comment and the feedback and your detailed review of our draft report. We have addressed specific comments below.
Anonymous comments based on AAWC Guidelines	Introduction	Please consider scanning the AAWC Pressure Ulcer Guideline and Evidence Table for additional relevant references for all topics addressed in this CER, in case they are helpful.	Thank you for suggesting these very helpful resources.
Thomas Smith	Introduction	Appropriate	Thank you for your comment.
James Adamson	Introduction	Does not include Unstageable and Suspected Deep Tissue Injury definitions.	These have been added to the description.
James Adamson	Introduction	The conclusions re electrical stimulation are not consistent the NPUAP report	We conducted our review and synthesized evidence independently of other entities, including NPUAP. Our conclusions reflect our evaluation of existing evidence, while the NPUAP report likely reflects both assessment of the evidence as well as expert opinion. We hope the two reports will provide complementary guidance.
Laura Bolton	Introduction	Just a note: the review mentions that there is no standard terminology for support surfaces but, in fact, the NPUAP support surface standardisation initiative published a set of terms and definitions in 2007. www.npuap.org	This was reviewed and used to inform the classification of support surfaces. The citation has been added to clarify and we now refer to the NPUAP classification in the report.

Commentator & Affiliation	Section	Comment	Response
NPUAP	Introduction	The 2007 NPUAP staging system is a six stage system which includes Unstageable and Suspected Deep Tissue Injury (Executive Summary and Introduction). Research on PU healing is typically limited to Stages I-IV but the NPUAP-EPUAP Clinical Practice Guidelines, 2009reaffirmed the six stage system.	These have been added to the description and we have changed the figure for the NPUAP staging system.
Reviewer: 1	Methods	Yes	Thank you for the comment.
Reviewer: 2	Methods	I would recommend future consideration or SOMEWHERE that the issue of treatment fidelity be raised and addressed. If nothing else this could be in the discussion. In all fairness...these were not the best designed studies in most cases and it was not clear how treatments were implemented? were treatments implemented as intended? if the wound vac was being used...was it worn truly by the individually as recommended; was it working and on and on. In real world settings we will know that this is an issue.	We have added a comment about treatment fidelity in the section on limitations of the evidence base.
Reviewer: 2	Methods	I would recommend including only good and above studies and only those a sufficient SS to demonstrate effectiveness ..or at least some reasonable size sample. otherwise I think the findings will be overinterpreted.	We appreciate this suggestion, but given the paucity of good studies (our highest category), and studies with large sample sizes, we felt it necessary to review and report on lower quality and smaller studies. We have qualified evidence from those studies in our ratings of strength of evidence.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 2	Methods	Also with regard to inclusion and exclusion...not 100% sure how to do this best given all the studies but the whole area of contributing factos-age of individuals, and of major concern is whether or not folks with arterial insuf were included? anemia? nutritional status etc. In some studies these things were exclusion criteria and others they were not. this could be in the discussion if not considered.	We report the inclusion/exclusion criteria for the studies in the Evidence Tables and discuss the differences in populations as one of the characteristics of this literature. The inclusion and exclusion criteria, and description of these criteria, were highly variable. We have added a comment about more standardized description of patient characteristics in future studies in our Research Gaps section.
Reviewer: 3	Methods	The methods section was very well written. I think the methodology was well spelled out and the criteria for grading and reporting the evidence seems very clear. The specific grade for each of the studies and the strength of the body of evidence seems excellent. The authors took some pains to explain the selection process for each article which was good for this systematic review. The statistical methods were discussed; however, most of the results were heterogeneous and were not placed into a meta-analysis. Weaknesses: None, this section is clear.	Thank you, we appreciate your comment and the feedback.
Reviewer: 4	Methods	Inclusion criteria are justifiable and search strategies in the Appendix are explicit and logical. Should there be some description of the search terms used in the body of the report? Statistical methods were not utilized for most of the report for appropriate reasons, and appear appropriate when studies could be pooled.	We have included search terms in an Appendix per standard CER protocol.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 5	Methods	Clear, justifiable	Thank you.
Reviewer: 6	Methods	The inclusion and exclusion criteria are clear, however, it may be appropriate to break out pressure ulcers due to Spinal Cord Injury from all the rest as a subanalysis. Given the paucity of data this may not be possible.	As mentioned by the reviewer, for most interventions, the number of studies and sample sizes were not large enough to allow meaningful stratification of results by patient characteristics. Where possible, we tried to examine results for SCI patients separately.
Reviewer: 6	Methods	The TEP recommended including hyperbaric oxygen as an adjunctive therapy, however, that is not included in any of the summaries. Recomend explicitly stating whether there were or were not any studies related to HBOT	We conducted an additional search for hyperbaric oxygen at the request of our TEP, as noted in our methods section. There was only one study that met our predefined inclusion criteria, which we describe in our Results.
Reviewer: 7	Methods	The inclusion and exclusion criteria were justifiable. I particularly liked Appendix D and having the list of included studies broken down by category. I also appreciated having the excluded references listed (Appendix E) and with each reference having the reason for the exclusion provided. This is meaningful to me as a reviewer and reader, as I have seen other topical reviews that were not as meticulous as this one was.	Thank you, we appreciate your comment and the feedback.
Reviewer: 7	Methods	I apprecaited the clarity of the inofrmation about the search strategies and they were sensible and direct.	Thank you, we appreciate your comment and the feedback.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 8	Methods	The inclusions and exclusion criteria were reasoned and clearly explained. Reduction of factors that might bias the review are adequately detailed. The quality of study assessment is fair, however, the factors used to assess this were not always as well known as they are today. Hence, earlier studies will not fair as well as more recent studies provided invesitgators of more recent research have been applying more current standards to their study methods and design.	Thank you, for your comment. We agree that older studies may not have been designed to reduce bias, or the reporting of these standards may not have been as common. However, for methodological reasons we are not able to apply a different set of quality standards to older studies and all studies that were included were evaluated using the same predefined criteria.
Reviewer: 9	Methods	The inclusion and exclusion criteria are justifiable	Thank you.
Reviewer: 9	Methods	The search strategies are explicit, however, the years of searching need to be clarified	Thank you for your comment. We have clarified the years searched and provided our rationale for choosing this time frame based on the suggestion of technical experts in the field.
Reviewer: 9	Methods	The definitions are clear and appropriate	Thank you.
Reviewer: 9	Methods	the statistical methods are appropriate	Thank you.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Methods	Regarding the inclusion/exclusion criteria: The list of excluded studies with reasons was very helpful, however, I have concerns about the exclusion reasons or terminology documented for some of the studies/articles such as "wrong outcomes," "unable to find," "excluded background," "wrong intervention," or "not relevant" - there were 116 studies listed as "unable to obtain" this could represent a significant amount of relevant data.	Thank you for your comment, we agree that our reporting of the studies that we were not able to obtain could have been more clear. We have provided a more detailed accounting of the 116 studies listed as unable to find and have recoded these studies for clarity as follows below. These studies that were unobtainable so we did not initially code them with the same amount of detail as the full texts we reviewed, however, for greater transparency we have provided the exclusion codes for the studies that did not meet our inclusion criteria: Conference Proceedings – 33 Foreign Language, not translated – 33 Prevention/papers that should have been excluded at abstract – 5 Exclusion code reason: 3 (wrong population) – 5 4 (wrong intervention) –2 5 (wrong outcomes) – 2 6 (no original data) – 6 9 (true unable to find) – 22 NR (not relevant) –3 Miscoded Duplicates – 2 Studies that were obtainable after exhaustive secondary searches and added to our review: 3
Reviewer: 10	Methods	I was a little disappointed that articles which studied the effects of a designated wound team on pressure ulcer healing rates (versus no designated wound team approach) were excluded as "not relevant." System wide approaches to PU treatment such as specialist teams (with multipronged interventions) may or may not be more effective in healing PUs than one particular therapy.	We agree that such studies are highly relevant to the management of pressure ulcers. We included this variable as a contextual factor in our approach to the evidence. However, examining this aspect of pressure ulcer management was beyond the scope of this report. The AHRQ is developing a review on treatment of chronic venous ulcers. The protocol can be found at this link: http://www.effectivehealthcare.ahrq.gov/ehc/products/367/995/CVU_Protocol"

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Methods	I also have mixed feelings about not including clinical studies examining other chronic full thickness wound healing. If added to the body of evidence presented thru this SR, would it provide stronger overall evidence as to the efficacy of certain wound treatments? Certain wound treatments may be easier to test in large RCTs on full thickness chronic wounds that are NOT pressure ulcers simply because of the rigorous nature of the research design. example: patients with stage III and IV pressure ulcers may be difficult to recruit in one location or timeframe; the area of the wound (sacral/coccyx) with confounding issues such as incontinence may make strict study protocols difficult to adhere to (hence the lack of evidence in this population). Couldn't evidence of healing effectiveness in other large chronic full thickness wounds be important to apply to the body of evidence for PU treatment considerations?	We agree that evidence on other types of wounds may have relevance to pressure ulcer care. Reviewing that literature, however, was beyond the scope of our time and resources. Some other reviews have focused on chronic wounds in general. In addition, AHRQ is developing a report on treatment of chronic venous ulcers. The protocol can be found at this URL: www.effectivehealthcare.ahrq.gov/ehc/products/367/995/CVU_Protocol
Reviewer: 10	Methods	In addition, there could be some clarification about the exclusion of other systematic reviews which looked at comparative treatments that the author states were excluded for reason of: "systematic review not directly used" - were all of the primary studies contained in these excluded systematic reviews used in the current analysis or just some of them?	Thank you for your comment. Primary studies from retrieved systematic reviews were evaluated for inclusion in our review based on our inclusion/exclusion criteria. Studies in those reviews, for example, that addressed wounds other than pressure ulcers were not included. Regarding the inclusion of systematic reviews, we reviewed the reference lists of the systematic reviews that were not directly used and evaluated all the studies used in these reviews to ensure we assessed all the literature used in previous reviews. However, studies that did not meet the specific inclusion/exclusion criteria for this report (for example studies published prior to 1985 or only available in a foreign language) were not included.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Methods	While the search strategies were explicitly stated and logical, I also have a question regarding the years reviewed: 1985-2011 - I didn't see a stated rationale for this time span. The author's did mention pre-1985 studies that were reviewed by Reddy et al. and how they felt they did not miss any important studies but did not mention a clear reason for their selection of 1985-2011 date span.	Thank you for your comment. We have provided the rationale for our choice of 1985 as a cutoff. We describe the reason for only including studies published from 1985 forward in the methods section, inclusion exclusion criteria section of our report we limited our search to publications and investigations conducted within between 1985 and present per recommendation from our Key Informants and TEP, and in accordance with guidance from the European Pressure Ulcer Advisory Panel.
Reviewer: 10	Methods	The definitions or diagnostic criteria for the outcome measures seemed appropriate (wound healing). The statistical methods used appeared appropriate for a systematic review.	Thank you.
American Physical Therapy Association (APTA)	Methods	Although some “interventions” and “adjunctive” therapies were discussed in the draft report, we did not feel that list was fully inclusive and had previously suggested in our comments on the key questions for this review that additional interventions be delineated in the report. For example, treatment strategies employed by physical therapists such as off-loading gait, patient positioning, and exercise for optimal wound healing were not included; we feel that these interventions contribute to the healing of wounds in a variety of different settings and patient populations.	Thank you for your comment. We did not find studies on patient position/off-loading.

Commentator & Affiliation	Section	Comment	Response
APTA	Methods	Lastly, we recognize comparing interventions within defined categories is an important part of determining the efficacy of treatments and feel that this will yield valuable information and guidance in clinical practice. The report did not consider the efficacy of multi-factorial interventions in the treatment of pressure ulcers versus single intervention approaches. The use of multi-factorial treatment approaches for pressure ulcers may demonstrate improved results in certain patient populations and therefore this report should more closely examine these approaches.	We did search for multi-factorial interventions (or 'co-interventions') as reported in the Interventions and Comparators subsection of our Scope and Key Questions section. We found limited evidence in that realm, which we indicate in the Applicability subsection of our Discussion.
Catherine Ratliff	Methods	good did not look at medical device related?	Thank you for your comment. We assessed medical devices such as alternating pressure beds and other interventions.
James Adamson	Methods	Research methods appear very good and thorough. Other search engines not used were pubmed.gov and Medscape.com	Numerous search engines are available to search for studies in MEDLINE and other relevant literature databases. We used a variety of search engines to retrieve citations from several different databases. We also reviewed included studies, reviews, and background articles for important studies we may have missed in our electronic searches. We do not believe that using additional search engines would have resulted in a meaningfully different set of included studies.
Laura Bolton	Methods	Inclusion criteria: I question the inclusion of clinical studies, which are up to 27- years old, particularly when healthcare practice has changed substantially and the control intervention is no longer considered an acceptable standard of care for the treatment of patients with wounds: i.e. using a standard non-pressure redistributing (PR) foam or unspecified 'intervention', loosely described as 'standard practice'. One would naturally expect most modern PR support surfaces, including AF, to perform better than no therapy at all, but	We decided to include the same years for all interventions, from 1985 to 2012. By definition that means older studies were included. We specified years and described the interventions and what was the comparator so that the reader is aware of this. We have added to text to highlight that many studies are older and use comparators that are not currently considered standard practice in many settings, but we did not exclude studies that examined practices that may not be “best practices” but are common.

Commentator & Affiliation	Section	Comment	Response
		this is not really helpful for current day decisionmaking. I believe that any study with an outdated 'control' arm, or with a vague set of ill-defined interventions, should have been excluded at source rather than deferring to an arbitrary cut-off date which, coincidentally, permitted inclusion of the only study rated as 'good'. My specific observations on the 5 included studies are discussed below: 1) Allman 1987: rated as 'good' This compares AF with an alternating surface that was removed from the market as early as 1991. The Lapidus was an alternating overlay used with a foam pad at the patient interface, this would have significantly affected the alternating action and so when tested, Krouskop rated the device in 1985 as no better than a foam mattress. Summary: Outdated comparator, which does not represent contemporary AP technology.	
Laura Bolton	Methods	2) Munro 1989: rated as 'fair' Uses an undefined 'standard' bed as a comparator which, given the date, would likely to be nonpressure-redistributing foam and would not be considered acceptable practice today – the NPUAP guidelines gives clear guidance as to minimum standards of care for patients with wounds. Summary: comparator, outdated	The comparator is not one of the criteria used in quality rating. We have revised the text to clarify what comparators are used and that some are not currently considered best practice in many settings.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Methods	3) Strauss 1991: 'fair' Compared AF with vague 'standard' or 'conventional' care. If comparators are ill-defined and/or outdated it is impossible to make a judgement on applicability today. Summary: Ill-defined comparator, therefore nongeneralisable.	Applicability or generalizability are not included in the quality assessments of individual studies per AHRQ guidance. Applicability is considered separately and discussed in the text. We have added text that clarifies that many of the support surfaces studies are older and that this is a limitation of the literature.
Laura Bolton	Methods	Jackson 1988: 'poor' As above - Compared against several undefined and different surfaces! Summary: as above.	Same response as above.
Laura Bolton	Methods	Ochs 2005: 'fair' The data for one of the only major studies on AF beds to be published in 20-years was derived from a retrospective chart review and not from an intentional clinical study. This is fraught with all the reliability issues which exist when data is extracted from a noninvestigational database. Such are the risks of presenting a misleading conclusion from this type of research that a critical review of the Ochs paper was published (Clark 2008). Significant design and reporting errors are discussed in the review paper– please read Clark 2008 for more information.	Observational studies were included in this review as well as clinical trials, and the different types of studies were evaluated based on different criteria. Study design is taken into account when synthesizing evidence. Ochs 2005 met some, but not all of the criteria for an observational study and was therefore rated as fair.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Methods	Excluded studies: Given the significant lack of quality research, I am surprised that one contemporary RCT (Finnegan 2008) was rejected as being from the 'wrong population'. It provides both a clinical and (rare) economic outcomes comparing AF against a technically advanced AP support surface; it should be worthy of inclusion as its relative weaknesses are no worse than for other studies which have been included. I don't agree that it is realistic to apply an arbitrary sample size of 50 subjects for singlecentre surgical interventions, given that there are many other small studies included which might also be considered non-generalisable – especially those where the control intervention is not described. It is also, by design, not confounded by the surgical technique as all patients had the same intervention; it was the postclosure healing that was compared between AF and AP not the surgical procedure itself. I would ask that this study be reconsidered. Key points: Finnegan 2008: 40 subjects, AP vs. AF. Results: equivalence in terms of wound site healing but significantly greater cost associated with AF and much lower patient satisfaction. Summary: evidence that the claim that AF is superior to AP support surfaces might be flawed (see executive summary)	The population for this review was people with existing pressure ulcers. Post surgical patients were not included as they no longer had an ulcer to be healed. As the article is actually about prevention, it is in the scope of the companion review on pressure ulcer prevention.
Reviewer: 1	Results	Detailed, clearly described and applicable	Thank you for your comment.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 2	Results	If treatment fidelity is added...or simply if it is indicated if there was evidence in the study if treatment fidelity was addressed...a column could be added to the outcome tables. Tables with only studies of set size and quality would be easier to look at and digest. a description in the introduction of the many smaller etc studies could be included in the introduction.	Treatment fidelity was rarely if ever reported. We have addressed this in the section on Limitations of the Body of Evidence. Please see above for response related to smaller and poorer quality studies.
Reviewer: 3	Results	The results section was very complete and quite readable. The authors did a very nice job of categorizing the questions and placing them in sections with very readable tables. The tables were laid out in a format which allows the reader to obtain the important information quickly and in a concise fashion. The key messages and overviews were well thought out and appreciated to given an overall scope of the findings. I did not find and have not reviewed or read a manuscript that was not reviewed in this manuscript. Specific sections will be noted below:	Thank you for this comment.
Reviewer: 3	Results	Pressure reduction: Comprehensive discussion with appropriate sub-categorization based on type of pressure reduction device. See my comments below on air fluidized beds.	Thank you.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	Results	Nutrition (pages 30+): the discussion and categorizations appear appropriate as most providers use general vitamins, zinc (or vitamin c) and protein. The authors did a fine job of reporting this.	Thank you. We appreciate the comment. We have subsequently made some revisions to these categorizations based on other internal and external input.
Reviewer: 3	Results	Local wound care (pages 41+): Again, very comprehensive evaluation of most major categories of wound dressings.	Thank you for this comment.
Reviewer: 3	Results	Surgical treatment (pages 71+): Comprehensive, well done. I think the authors did an appropriate and fair job of reporting the changes in criteria midstream which was fair. Data is complete.	Thank you for this comment.
Reviewer: 3	Results	Adjunctive therapies (pages 84+) This was also well done. I again appreciate the emphasis on complete wound healing which should be the outcome of note for all studies. Unfortunately, most had intermediate outcomes of decreases in wound size. I appreciate the discussion of the harms which were more common in the adjunctive therapies.	Thank you for this comment.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	Results	Weakness or concern: Air fluidized beds: pages 18-19. This is likely the most controversial finding of the whole report. As the authors appropriately note, there is no difference in wound healing between air fluid beds and alternating pressure mattresses. We only see some changes in wound size. The authors did not report what is a clinically meaningful change in wound size. This would help place the findings from the 5 studies in context of both statistical change and clinical relevance.	The text has been revised to clarify what it is possible to conclude about AF beds from the available evidence.
Reviewer: 3	Results	NPWT: While the reviewed studies did not indicate harms with NPWT, the FDA has issued warnings about the safety (death and bleeding) from NPWT. Most of these reports may be post-marketing reports; however, with the risk of death with the use of a device with insufficient evidence, I think some mention must be made in the harms section (or referenced).	Thank you for this comment. We have included a comment about the FDA warning in our review.
Reviewer: 4	Results	The amount of detail about studies, populations and interventions is generally appropriate.	Thank you.
Reviewer: 4	Results	I would prefer to see the sections of the strength of evidence table in Appendix G presented in the body of the report for each relevant group of interventions, or at the least in the discussion section.	We appreciate your comment. Because strength of evidence tables can be quite long, we typically place them in the appendix of reports to ease readability. However, we summarize the contents in Table A of the executive summary and Table 31 of the main report.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 4	Results	Key messages are explicit, but I would favor stating explicitly that there is or isn't evidence for complete wound healing, and if there is, what the strength of that evidence is.	We appreciate this opinion about how to present findings and struggled with this issue ourselves. In the end, we felt it important to consider wound healing outcomes as a spectrum. Although complete wound healing is the ultimate goal, interventions used on more severe ulcers are often unlikely to produce complete wound healing, even if highly effective, over the short duration of most studies. Other interventions used for smaller or less advanced ulcers might produce complete wound healing, even if only mildly effective. Because this was a comparative effectiveness review, we considered it important to ensure a level playing field, to the extent possible, across intervention types. We therefore prioritized the outcome of complete wound healing but did not separate it completely from other wound healing measures. We have explained this reasoning in the Outcomes section of our Scope and Key Questions section.
Reviewer: 4	Results	I am not aware of studies that have been overlooked.	Thank you for your comment.
Reviewer: 5	Results	Clear tables, meaningful criteria for inclusion/exclusion. Comprehensive.	Thank you.
Reviewer: 6	Results	The detail is exquisite in this comprehensive review.	Thank you.
Reviewer: 6	Results	Specific typographical suggestions: p17, line 32-34 is duplicated in lines 36-38	While similar in language and appearance, these are in fact two distinct sentences. One relates to effectiveness outcomes and the other to harms. "Outcomes of interest for effectiveness were resolution of ulcer determined by complete wound healing, healing time, reduction in wound surface area, and reduction in pain, prevention of serious complications of infection such as sepsis or osteomyelitis, and ulcer recurrence rates. Outcomes of interest for harms were pain, dermatologic reactions, bleeding, and complications including but not limited to infection and need for surgical intervention. "
Reviewer: 6	Results	P17, line 40: change 'decubitus' ulcer to pressure ulcer	Thank you for bringing this to our attention. We have made the suggested correction in the final report.
Reviewer: 6	Results	p33, line 21: ... dextranomer past to be inferior to ___ Please describe the comparator	We have added the comparator.
Reviewer: 6	Results	p35, line 16: extra words in the sentence need to be corrected/deleted (of the of our)	Thank you for bringing this typographical error to our attention. We have made the suggested correction in the final report.
Reviewer: 6	Results	p116, line 34: Change 'lover' to 'lower',	Thank you for bringing this typographical error to our attention. We have made the suggested correction in the final report.
Reviewer: 6	Results	p116, line 45 change 'is suggest' to 'it suggests'	Thank you for bringing this typographical error to our attention. We have made the suggested correction in the final report.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 7	Results	The detail is appropriate and manageable. The tables do a good job of presenting the relevant data and provide a good overview of the relevant work. I valued the presentation for each technique with the effectiveness section ad was particularly pleased to see the key points outlined for each modality. Comparative effectiveness and harm sections were very clinically useful for me and they were presented clearly and consistently.	Thank you. We appreciate the comment and feedback.
Reviewer: 7	Results	There was very thorough coverage of the literate and again, the Tables were very helpful in the presentation of the data.	Thank you. We appreciate the comment and feedback.
Reviewer: 7	Results	I very much enjoyed reading the results section of this manuscript.	Thank you. We appreciate the comment and feedback.
Reviewer: 8	Results	Description of studies and results seemed about right. The tables were easy to follow and supported the text (may have been a bit duplicative but some readers may focus on one vs. the other so probably not an issue).	Thank you. We appreciate the comment and feedback. We have revised the tables to minimize redundancy.
Reviewer: 8	Results	I am not aware of any studies omitted. Looked comprehensive based on my knowledge of the literature.	Thank you.
Reviewer: 9	Results	The amount of material is appropriate, the messages are clear and the figures etc appropriate	Thank you.
Reviewer: 9	Results	Should more reference be made to Cochrane reviews?	We have referenced Cochrane reviews in our Discussion section on findings in relation to what is known.
Reviewer: 9	Results	page 22 line 47, the heading is AP beds, yet the data relate to cushions	Thank you. The formatting error in this table has been corrected.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Results	In the results section on the bottom of page "v" the use of the word collagen could be clarified (all collagen containing products? collagen gels, pads, pastes, particles, matrix sheets, powders, or solutions? and bovine, avian, or human sources of collagen?).	We have clarified our finding to indicate that it referred to various topical collagen applications.
Reviewer: 10	Results	Also in same section, clarification may be helpful when making statements like " dextranomer was less effective than standard wound dressings or other topical agents" - dextranomer paste or beads or both?	We have specified that the finding refers to dextranomer paste.
Reviewer: 10	Results	And what were "standard dressings"? Perhaps describing what "standard dressings" are at the beginning of the results section would be helpful. A clinician will be most likely to go to this results section for the "bottom line" or "take home" message. I felt this section's key messages could be more explicit and applicable.	We have avoided the term "standard dressings."
WOCN	Results	The findings are consistent with other available systematic reviews and published clinical guidelines, including WOCN's. The review reinforces there is a lack of well-designed studies to provide a high level of evidence as evidenced by the small number of studies (165) meeting the inclusion criteria, included in the review.	We appreciate the comment that our findings are consistent with other sources.

Commentator & Affiliation	Section	Comment	Response
WOCN	Results	It is not possible to draw definitive conclusions about superiority of one intervention over another from the review due to the lack of strong evidence. The strength of evidence for findings about the large majority of the 69 key outcomes reviewed was low for 21 and insufficient for 41 key outcomes. Only 7 key outcomes had findings with moderate strength of evidence due to poor quality studies or no studies available or retrieved.	This is a reasonable interpretation of our findings.
Thomas Smith	Results	I have been treating chronic wounds for over 35 years, 15 years as medical director of a nursing home. Negative pressure via a wound-vac has shown vastly superior results in my experience.	Thank you for providing us with information regarding your experience with NPWT devices, AHRQ published a 2009 report, Negative Pressure Wound Therapy Devices Technology Assessment Report, available at: http://www.ahrq.gov/clinic/ta/negpresswtd/npwtd01.htm
Catherine Ratliff	Results	wish there were more research studies but write up very detailed	Thank you for your comment, we appreciate your feedback on our report and we appreciate your concern about the lack of good studies.
James Adamson	Results	Page 89, last paragraph, first 3 sentences, are not well constructed and are confusing.	Thank you for your comment, the text has been revised.
James Adamson	Results	different conclusions than those reached by NPUAP and EPUAP	Our conclusions are based strictly on study findings. NPUAP and EPUAP guidelines are complemented by expert opinion and possibly extrapolations from the body of scientific studies, which may have given rise to differences in conclusions. Guidelines augment the available research evidence with other sources, such as expert experience in order to make recommendations. Our systematic review is limited to summarizing and synthesizing scientific research.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Results	Evidence for healing active (alternating) surfaces. It was disappointing that several informative studies were not included in the review, particularly as these provide some very worthwhile economic as well as clinical outcomes. These are listed below and could perhaps be reconsidered for inclusion. 1) Wallenstein et al. 2002 (poster attached)	Thank you for suggesting we reconsider these studies. We reviewed these again based on your comments and we have clarified how they were treated in our review.
Laura Bolton	Results	2) Brem et al 2000. This paper (and above poster) reflects partially published or 'grey' literature, which this AHRQ review was willing to accept. It represents a rare and very well designed prospective outcome study following the healing of full-thickness (stage 3 & 4) sacral/coccygeal ulcers. In total the rate of healing for 96 subjects is reported (poster) and referred to in the subsequent paper. These were mainly respiratory or surgical ITU patients, ventilated and all with nosocomial ulcers that had developed on reactive surfaces. The author is an ex-Board member of NPUAP. Summary: The rate of closure was 50% at 4-weeks.	The poster and article describing this study were excluded because the study does not include a comparator and does not meet our inclusion criteria.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Results	3) Clark et al. 2002 The largest formal prospective clinical outcome study carried out to date. The analysis included both clinical and economic outcomes for all support surfaces including air fluidized. The multicentre recruitment of more than 2,500 patients ensured that all support surface modalities were included. This paper explains the study design; the paper below describes analysis and outcome.	Clark 2002 is an informative descriptive study, but was excluded primarily because it does not include data on any of our stated outcomes. The reasons for exclusion have been changed to clarify this.
Laura Bolton	Results	4) Clark (2001): The economic analysis from the above study.	Cost effectiveness studies and modeling studies do not meet the inclusion criteria for this review.
Laura Bolton	Results	5) Fleurence RL (2005) A cost-effectiveness review rejected on the grounds of 'excluded background'? In fact this study makes some astute observations regarding alternating surfaces and pressure ulcer treatment; these further support the findings by Clark above. Alternating mattress overlays are good for prevention while mattress replacements are most cost-effective for treatment.	Cost effectiveness studies and modeling studies do not meet the inclusion criteria for this review. This was the primary reason for exclusion. The coding as background indicates that we did review the full text, but it was not included in the synthesis of results. The reasons for exclusion have been changed to clarify this.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Results	6) Malbrain (2010). Small RCT but, nevertheless, with very clear findings in favour of AP over an air filled reactive surface – counters the conclusion that there is little to differentiate AP surfaces from different modalities. ITU population so greatest risk represented. This author also recognized that 'more recently developed pressure-relieving systems might be cost-effective as an alternative to traditional approaches for the management of PU". Ulcer healing on AP vs. no healing (and deterioration) on an alternative reactive surface.	Malbrain 2010 is included; however, we included only the results about healing for patients with pressure ulcers.
Laura Bolton	Results	7) Phillips (2000). Report of prevention and treatment outcomes in 160 ITU patients. Study excluded on the grounds of 'excluded background'? Whilst not a comparative study it does represent evidence of the utility of alternating surfaces in the management of wounds in very high risk individuals including those who cannot be regularly repositioned– a main indication for this modality (NPUAP). Summary:80% of superficial ulcers healed	The study was excluded because there was no comparison included and therefore it did not meet our inclusion criteria. The coding as background indicates that we did review the full text, but it was not included in the synthesis of results. The reasons for exclusion have been changed to clarify this.

Commentator & Affiliation	Section	Comment	Response
NPUAP	Results	A comment on page 17 reads, "Currently there is no universally accepted classification of support surfaces." While this technically correct, there has been broad consensus reached between the US, European, Japanese, and others that the general (nonmutually exclusive) categories of support surfaces are reactive support surface, active support surface, integrated bed system, non-powered, powered, overlay, and mattress. (NPUAP-EPUAP Clinical Practice Guidelines, 2009)	Thank you. This description has been cited and was considered, however, mutually exclusive categories were used to group the evidence and allow strength of evidence assessments.
Hill-Rom	Results	Healing Rates on LAL Surfaces •Beyond this point, these rather forceful conclusions seem inconsistent with the evidence presented in Table 3 that appear to suggest a relatively strong trend toward increased healing rates on LAL. The only "Good" quality study (Ferrel) showed a highly significant difference in healing rates vs. foam and two of the others (all rated Poor) showed significant or trending toward significance (P-values of 0.042 and 0.06). •Ferrel: highly significant decrease in mean wound area of 9.0 vs. 2.5 mm2/day (P = 0.0002) •Mulder: LAL significantly decreased wound area vs. std foam (P = 0.042) •Caley: Wound are not significantly different vs. foam (but P = 0.06) •Day: No significant change in wound area (P > 0.05) The Ochs et al. study, not included and judged to be of fair quality, also	We do not agree that our conclusion was forceful and in fact we qualified it at several points in the discussion and limitation sections of the report. Additionally, we worked to make our criteria consistent across treatments and these were provided. The team chose to synthesize the evidence at the level of LAL beds, and a more granular synthesis was not possible. More research may shed more light Also we aimed to provide enough information for the readers to decide if they would take other approaches. The Ochs Study is included in the report. It is included in the section on AF beds because of advantage reported in wound healing for AF beds.

Commentator & Affiliation	Section	Comment	Response
		showed a reasonably strong trend toward increased healing rates on Group II surfaces, a category that obviously includes a broad range of product types and performance capabilities. Although we believe it is appropriate to conclude that this does not give definitive evidence that LAL improves healing rates, if a heterogeneous group as a whole shows a strong trend in this direction, this suggests that some of the products within this class must be performing quite well. So while this additional study does not directly support LAL efficacy for treatment, it certainly runs counter to the relatively forceful conclusion that "…there is no overall benefit to low air-loss beds compared to standard foam mattresses." The evidence does suggest that some of the products in this category are probably quite effective, we just don't know which ones they are. The question appears to be, at worst, more open than is implied.	
Hill-Rom	Results	In the "Results" section (p. v) it states that "different mattress brands are comparable in performance", yet the supporting evidence (p. 20) indicates that the Nimbus product from Arjo-Huntleigh was used in all three studies. This only supports the conclusion that no statistical significance could be found between the technology of Nimbus and other alternating pressure. Please recall in the laboratory data	We are aware of the limitations of the available studies and in the final report we added more to the discussion about when studies were conducted and the limited comparisons. If there were more studies identified that met our criteria, we would have included them. The laboratory data and studies of pressure waves could not be included in this review as the inclusion criteria required that the studies be of patients with pressure ulcers and outcomes related to healing.

Commentator & Affiliation	Section	Comment	Response
		that we submitted in our Grey Data (we can re-submit if you like) that using the same general methods and indices of performance recommended by the EPUAP's Alternating Pressure Committee, that the pressure waves imposed at the sacrum, ischial tuberosities, and heels differ markedly from product to product. And again, we would expect them to have different effects on the body. In fact, in each of these indices, there are some alternating pressure products that are more similar to static ("CLP") surfaces than to other alternating pressure products. Therefore if these indices are reflective of the products therapeutic effects (as concluded by the experts that selected these indices of performance on the test committee), it is critical to test a broad range of products if one is to draw any general conclusions about performance of products in the group as a whole. Our testing also indicates that each company tends to deliver the AP therapy with characteristic pressure wave patterns on their own products that are relatively similar but often differ quite a bit between manufacturers. All of this suggests to us that, as stated above, your conclusions do not generalize "to different mattress brands" but apply primarily to a narrow band of products. Furthermore, all of these studies referenced in this conclusion were from 2006 and earlier.	

Commentator & Affiliation	Section	Comment	Response
Hill-Rom	Results	On page 16, there is no mention of heat and moisture as a contributor to the development of pressure ulcers and safe skin. This is one of the hottest topics in pressure ulcer research and, although these tend to be lab and animal studies rather than clinical studies at this point, we feel this omission is significant in any authoritative reference on pressure ulcer etiology and safe skin in 2012.	While this may be important information, the scope of the review did not include animal studies. Specifically, because the population of interest only included patients with pressure ulcers, studies of biological properties conducted in vitro and animal studies were excluded from our review.
Hill-Rom	Results	An additional general but important point: average length of stay was not referenced in any table, which could impact the conclusions drawn on studies.	We focused on the length of the intervention rather than the average length of stay since the later varies depending on the setting and was inconstantly reported. The evidence tables report duration of treatment (when reported in the study) and the summary tables indicate the duration of follow up. Because our review included non hospital settings, such as long term care facilities and patients receiving treatment in the home, this is a more appropriate and consistent measure than length of stay. We note in our limitations of the evidence base section that “a major limitation of studies in our review was the duration of interventions and followup periods, typically a few weeks.
NPAUP	Results	Page 18 (Results) discusses a study of Air Fluidized beds which apparently backstaged the ulcers. Stage III and IV ulcers do not heal to Stage II. This ‘study’ also failed to provide data for the control group.	Thank you. We are aware of the deficiencies in this as well as other studies which is one of the reasons the strength of evidence is not rated as High.

Commentator & Affiliation	Section	Comment	Response
Hill-Rom	Discussion/Conclusion	We saw no reference to the studies mentioned on p. 18 that were reviewed for "innovative and/or more cost effective" and yet the article seems to warn the audience about AFT that "any decisions about such investments would need to take into account both the fact that the effectiveness of these beds was measured in terms of wound size reduction, rather than complete wound healing, and the cost associated with this technology compared to other surfaces.". Without sufficient evidence to support financial justification correlated to wound healing size, the recommendation to compare other surfaces cost effectiveness does not appear to be well supported with published clinical studies.	This text has been revised.
Reviewer: 1	Discussion/Conclusion	Clear and concise discussion and conclusions	Thank you.
Reviewer: 2	Discussion/Conclusion	If all is left as is...would stress the points of concern-size, quality and treatment fidelity. This was noted some and appreciated. I would also address in the discussion inclusion and exclusion criteria differences across the studies.	Please see response to earlier comments. We have addressed variability in patient populations in our Discussion.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	Discussion/Conclusion	The discussion section outlines and reiterates the findings from the comprehensive results sections. Practically, most providers or policymakers will review the individual results section to determine the applicability of the treatment option. In the overall discussion, the authors did a good job of putting this systematic review in perspective. I appreciate the review and comparison with Reddy's work in 2008 to see how this systematic review compares with the previous work. Evidence in pressure ulcers has little changed in 4 years and the findings reflect that.	Thank you for this comment.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	Discussion/Conclusion	As note previously, the interpretation of the air fluidized bed will require the most thoughtful discussion. When there is a difference of opinion (Reddy's study and the current systematic evidence review), I think it merits some further discussion on why there is a difference and what other systematic reviews say on this option. McInnes in 2011 reviewed the same studies for air fluidized beds for the Cochrane group and used 3 studies. The Cochrane group felt there was no difference in support surfaces for the treatment of pressure ulcers. While this controversy and other reviews do not change the findings from this systematic review, I think it should be discussed that the evidence is not as strong as would seem to come across in the report. This has important ramifications as many groups will use this report as the basis of guidelines and the cost differentials for air fluidized beds versus other support surfaces is very significant.	We have added more text to the discussion about how our results compare to other reviews. The Reddy review did not report on AF beds specifically. The more recent McInness review does report that 2 of 3 trials found reductions in PU size on AF beds.
Reviewer: 3	Discussion/Conclusion	For future research and clinical direction, the authors outlined the lack of good evidence for most if not all of pressure ulcer care. Thus, for a clinical problem that may costs 11 billion dollars a year, we need evidence of what works and does not work. This future research will require funding, time and expertise to answer some of these questions.	Thank you for your comment. We agree.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 4	Discussion/Conclusion	It is not clear to me how different outcomes were combined for the SOE assessments. I would like to see the SOE for the intervention/comparator pairs just for the outcome of complete wound healing; then if you want to group all the other related outcomes that one hopes correlate with eventual healing, I wouldn't object. I'm just not sure how well those intermediate outcomes predict complete healing, which was the reason the TEP argued for that being the most important outcome.	Please see response to earlier, similar comment on this issue from Reviewer 4 in the results comment section.
Reviewer: 4	Discussion/Conclusion	In the section on local wound applications, the statement is made that "several studies found statistically equivalent outcomes between intervention and control groups." I would avoid using the term "equivalent" just because the studies failed to find a statistically significant difference unless the studies were adequately powered and designed as equivalence trials, with a pre-specified minimum important difference and margin of equivalence.	We appreciate this observation and have changed our wording to indicate that "several studies found no statistically significant differences…"
Reviewer: 4	Discussion/Conclusion	Limitations are clear for the evidence base and for the review.	Thank you.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 4	Discussion/Conclusion	The section on future research could be more explicit in terms of addressing areas of insufficient or low strength evidence in addition to the issues of length of follow up and outcome measurement. A discussion of the most important outcomes and the best outcome measures would also be helpful. Encouraging reporting of QoL, pain and other patient-centered outcomes would be great.	We have added a discussion of future research in areas with low or insufficient evidence. We have also added mention of patient-centered outcomes in the research Gaps section.
Reviewer: 5	Discussion/Conclusion	Clear statements of existing limits of literature. Useful conclusions.	Thank you.
Reviewer: 6	Discussion/Conclusion	The division of subjects will allow researchers to hone in on their topic of interest if they do no intend to read the entire report. The reviw points out the paucity of quality research, lack of controls and extreme heterogeniety in the study of pressure ulcer healing.	Thank you for this comment.
Reviewer: 6	Discussion/Conclusion	The future research section could be made more explicit by identifying several key recommendations from the review panel. Specifically, based on the available evidence, what should be used as a comparator for topical therapies? What would be a recommended length of a study? Can complete closure vs rate of healing be reconciled?	We appreciate the desire for specificity, but we do not believe the specific answers to many of these questions can be based on the available evidence. Rather they should be guided by current clinical practice and expertise in the field. We have added a comment stating this in our Research Gaps section.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 7	Discussion/Conclusion	This section was as well written as the other sections. It was easy to read, comprehend and follow. The implications of the review findings are clearly stated. The limitations of the studies was well presented and lends to the recommendations about future research that include "Future research with larger sample sizes, more rigorous adherence to methodological standards for clinical trials, longer follow-up periods, and more standardized and clinically meaningful outcome measures is needed to inform clinical practice and policy."	Thank you for this comment.
Reviewer: 7	Discussion/Conclusion	It appeared that all relevant literature was covered and reviewed.	Thank for your assessing this.
Reviewer: 8	Discussion/Conclusion	I had no concerns about the major findings.	Thank you for your comment.
Reviewer: 8	Discussion/Conclusion	I had no concerns about the major findings. The limitations are described, however I think a synthetic review of limitations would be very helpful in the report. Because a major limitation is the poor quality of studies it is very important to be as specific as possible about what standards should be used in future to move this science forward. It is quite disheartening that so many studies have been conducted and yet we still know so little.	Thank you for your comment. We have revised the draft report and have provided recommendations for future research needs.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 8	Discussion/Conclusion	I would like to see the authors make stronger recommendations about future study designs. For example, should studies be focused on not only specific pressure ulcer stages, but also locations of ulcers? Pressure ulcers are quite heterosgeneous, should reseachers be focusing on even tighter inclusion criteria in order to increase our understanding and translation to practice for specific therapies? Would they recommend that studies be stratified by certain ulcer characteristics? Things such as exudate/dryness might be considered as an important factor. Comments were made on the length of time of follow up. What could be recommended in terms of this so in future studies an adequate time is allowed to determine therapy benefit?	We appreciate the desire for more specific recommendations, but we do not believe the specific answers to many of these questions can be based on the available evidence. Rather they should be guided by current clinical practice and expertise in the field. We have added a comment stating this in our Research Gaps section.
Reviewer: 9	Discussion/Conclusion	The implications and limitations are clearly stated.	Thank you.
Reviewer: 9	Discussion/Conclusion	Once again, more reference to Cochrane reviews should be made	We have added more references to Cochrane reviews.
Reviewer: 9	Discussion/Conclusion	The recommendations for future research are a little vague, more specifics would be beneficial in guiding research more clearly	We have added areas we believe are appropriate for future research.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Discussion/Conclusion	The implications of the major findings of this SR were reviewed adequately. However, I have the same comments about the need to clarify some of the statements about specific wound products in this section (pages ES21 and ES22). For example, "other biological agents" (page 30, line 55) could cover growth factors, cell products including stem cells, SIS matrix technology, single layer or bi-layer skin substitutes, etc. The reader of this section could not differentiate exaclty which biological agents the authors are summarizing in this statement unless they go back through all of the tables, which would be cumbersome.	Thank you for this feedback. We provide more clarification in the main report which specific growth factors were studied. Details of the interventions are presented in Tables 24 and 25 of the main report.
Reviewer: 10	Discussion/Conclusion	Limitations of the review were described well, except for the lack of considering wound healing clinical studies involving other full thickness chronic wounds which may or may not be important to the body of knowledge or which may be applied to healing PUs.	We have added a comment about this limitation to our section on limitations of the review process.
Abbott	Discussion/Conclusion	Page 99: In the third paragraph, when summarizing the findings of Reddy et al. [1], the AHRQ report states “overall, nutritional supplements did not provide a benefit in terms of ulcer healing, but that protein supplementation may provide benefit.” We do not believe this statement accurately reflects the conclusions of the authors. Reddy et al made an important distinction in their study conclusion between those with and	We have added a comment about this limitation to our section on limitations of the review process.

Commentator & Affiliation	Section	Comment	Response
		without nutritional deficits. Specifically, the authors concluded "We found little evidence that nutritional supplements improve pressure ulcer healing in patients without specific nutritional deficiencies." Thus, they did not state that nutritional supplementation was not beneficial but rather that there was limited evidence of the impact of nutrition supplementation on patients who were not malnourished. In addition, we suggest that there is an opportunity to provide additional consistency with the "Implications for Clinical and Policy Decision Making" section of the Draft report. On page 100, in the third paragraph, the report states "Nutritional supplementation may provide benefit in terms of wound healing, though the effects of nutritional supplementation were not dramatic, and it was not clear from the studies in our review whether nutritional supplementation was beneficial to all patients or to those with evidence of nutritional deficiencies." Therefore, we recommend the statement in the AHRQ report about the Reddy et al study be changed to "Reddy et al reported that they found little evidence that nutritional supplements improve pressure ulcer healing in patients without specific nutritional deficiencies. Our findings were similar.	

Commentator & Affiliation	Section	Comment	Response
Abbott	Discussion/Conclusion	Page 100: In the third paragraph the AHRQ report states "Nutritional supplementation may provide benefit in terms of wound healing, though the effects of nutritional supplementation were not dramatic, and it was not clear from the studies in our review whether nutritional supplementation was beneficial to all patients or to those with evidence of nutritional deficiencies." We believe that the evidence and other conclusions in the report would be more accurately characterized by removing the word "may" in this sentence. AHRQ research reviewed in the report showed 12 out of 13 study conclusions with a consistent marked trend toward pressure ulcer improvement and healing. In addition, specific research reviewed (van Anholt et al) documented that even in patients without nutritional deficiencies nutrition supplementation can be beneficial. Therefore, we recommend that the statement in the third paragraph be changed to "Nutritional supplementation provides benefit in terms of wound healing, though the effects of nutritional supplementation were not dramatic to reach the point of complete wound closure."	Effect sizes were small, no studies showed an impact on complete wound healing, the highest strength of evidence rating for nutritional supplementation was moderate, and that finding did not apply to all forms of supplementation. We do not believe a more definitive statement is warranted.

Commentator & Affiliation	Section	Comment	Response
WOCN	Discussion/Conclusion	According to the review, currently there is not a strong body of evidence to support that any one treatment for pressure ulcers is superior to another. Therefore, there is a paucity of evidence that can be used for policy decision making (i.e., payment) and provide definitive direction for clinical practice.	Thank you for your comment. We agree with this interpretation.
WOCN	Discussion/Conclusion	The lack of strong evidence, due to inconsistent research methods, limitations in quality of design and differences in design and populations studied, indicates a continued need for education and funding support for well-designed studies targeted to provide data about priority areas.	Thank you for your comment. We agree.

Commentator & Affiliation	Section	Comment	Response
WOCN	Discussion/Conclusion	A limitation of published studies that was not specifically identified in the review, is that many studies of treatments include both partial (stage I, II) and full thickness pressure ulcers (stage III, IV) that have different healing rates and a different healing mechanism, and report findings based on pooled data. Due to differences in rates and processes of healing for partial and full thickness pressure ulcers, outcomes (rate, total time to heal), are expected to be different. Also, certain interventions might be more effective in either full or partial thickness ulcers, but not in both due to differences in physiology of healing. For example, many studies include all stages or stage II, III, & IV, and stage II would heal differently than the full thickness III & IV. Further, for stage II PU, certain interventions might be unnecessary as these heal quickly (primarily by regeneration) and the more extensive care needed to promote granulation tissue as with full thickness PU (stage III or IV) or are not needed. Future studies should limit comparisons to similar stages (partial or full thickness) or clearly identify the outcomes according to the specific stage.	We have added a comment in this regard to the Research Gaps section.

Commentator & Affiliation	Section	Comment	Response
APTA	Discussion/Conclusion	The draft report conclusions regarding the efficacy of various treatment interventions are not consistent with the current pressure ulcer treatment recommendations that have been authored and endorsed by the European Pressure Ulcer Advisory Panel (EPUAP) and the National Pressure Ulcer Advisory Panel (NPUAP).1 For instance, negative pressure wound therapy received a "low" grade in the draft report but has been rated as "strength of evidence B" by the EPUAP and NPUAP. As the EPUAP and NPUAP are the current gold standard recommendations in the care of patients with pressure ulcers, we have concerns that this report may cause confusion among providers in determining the most appropriate treatement interventions for patients with pressure ulcers. In addition, many of the references utilized in this draft report are antiquated, and we would recommend inclusion of more recent literature prior to finalizing the report.	Our conclusions are based strictly on study findings. NPUAP and EPUAP guidelines are complemented by expert opinion and possibly extrapolations from the body of scientific studies, which may have given rise to differences in conclusions. The NPUAP and EPUAP recommendations will continue to guide providers in the absence of a strong body of evidence. Regarding antiquated references, other commenters have questioned our exclusion of even older studies. We chose to examine studies dating back to 1985 based on input from our Technical Expert Panel, and we believe this represents a reasonable compromise. We have included the most recent studies available, up to 2012. For Support surfaces we included all studies that could be identified. Unfortunately, there was not more current literature. We added more qualifying statements about the comparators. While some of these comparators may not be best practice, they are still used in some care settings.
Thomas Smith	Discussion/Conclusion	Wound-vac vs standard care must be compared in a large \study.	Thank you for your comment, we agree.
Catherine Ratliff	Discussion/Conclusion	Good	Thank you for your comment.
Laura Bolton	Discussion/Conclusion	I would question the validity of reaching any conclusion about 'superiority' (compared to 'other support surfaces') as stated in the executive summary. There is insufficient evidence to place any confidence at all that air fluidized	Thank you for your comment. We have changed the wording in our report to point out the limitations in the literature.

Commentator & Affiliation	Section	Comment	Response
		beds outperform other support surfaces, perhaps with the exception of 'standard' mattresses. This is particularly true given that the evidence is built primarily on comparators that would not be considered to be pressure-redistributing support surfaces as the definition is accepted today: a specialized pressureredistributing device (NPUAP 2007). The credibility of making such an assertion was fully discussed some 11- years ago in the ECRI report on air fluidized beds. The same arguments posed then must surely stand true today and should caution against making bold statements of superiority? Given the significant supply base of airfluidized beds in the US healthcare system, I would expect to have seen a much greater effort to publish welldesigned, contemporary RCTs and economic studies. It is surprising that such evidence has not materialised, given requests from CMS between 1999 and 2002 for 'well- onceived and carefully carried out studies'. To continually rely on a small handful of weak and outdated papers, plus a questionable retrospective chart review, I think raises more questions than answers about clinical confidence in the air fluidized modality.	

Commentator & Affiliation	Section	Comment	Response
WOCN	Future Research Needs	Also, as mentioned in the review, complete healing was not commonly used as the outcomes measure in many studies and so it is difficult to compare outcomes. As mentioned in the review, funding for more long-term studies is needed with complete healing as the outcome measure.	Thank you for your comment. We agree.
Reviewer: 1	Clarity and Usability	Yes	Thank you for your comment.
Reviewer: 2	Clarity and Usability	As per my points above, I am concerned about over interpretation of the findings given the way things are presented.	We have given low or insufficient ratings for strength of evidence to many of our findings. We have tried to be appropriately cautious in interpreting our findings in light of the limitations of the body of evidence.
Reviewer: 2	Clarity and Usability	In terms of policy...most of the findings are inconclusive which is critically important. as a nurse practitioner and dealing with this in real world settings, what is currently being practiced even in wound care clinics (at high cost to the system!) is not even close to evidence based.	We appreciate this comment.
Reviewer: 3	Clarity and Usability	The report is very well written and clear. I think it reinforces many points that have been clear in the literature over the last 20 years. We don't have good evidence of treatment for pressure ulcers. The authors did a very thoughtful job of outlining the evidence and lack of evidence of the foundations of pressure ulcer care. I am also very appreciative that they mention the previous work on systematic reviews prior to this work. All of the literature and previous systematic reviews appear consistent.	Thank you very much for your comment and feedback on the report.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 3	Clarity and Usability	For future practice and policy decisions, we are still standing still with the evidence. The authors did an exhaustive job of reviewing the literature and we still have low strength evidence for many recommendations. Thus, expert opinion on fundamentals of care and quality will persist. This systematic review will be used as the basis of our fund of knowledge now; however, it does not help the clinical providers and nursing staff. We will still be left with clinical guidelines and expert opinions.	Thank you for your comment; we appreciate your feedback on our report. The American College of Physicians plans to use this evidence review and a complementary review on Risk Assessment and Prevention as part of their effort to develop new clinical guidelines for the treatment of pressure ulcers. We appreciate your concern about the lack of development of new evidence and hope the impact of our report will be to encourage more definitive research.
Reviewer: 4	Clarity and Usability	The report structure and organization is fine and main points are clearly presented. It would be helpful if the authors provided links (or even state the Table number) to the evidence tables when describing studies in the Results section.	Thank you for your comment and the suggestion to state the ET number in the results section of the report. We have revised the report accordingly.
Reviewer: 4	Clarity and Usability	I am concerned that the lumping of various outcomes in the determination of strength of evidence hampers the usefulness of the report for policymakers. Many policymakers are most interested in complete wound healing, and unless there is strong evidence for extrapolating the intermediate outcomes to complete healing, they will find the report less useful than if the evidence had been assessed separately for the intermediate outcomes.	Please see response to the earlier comment on this issue.
Reviewer: 5	Clarity and Usability	Understandable. Useful information	Thank you for your comment, we appreciate the positive feedback.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 6	Clarity and Usability	The conclusion from this very comprehensive review is that there are insufficient data to inform policy or practice decisions. This should be made clear in terms of how this report might be used to draft policies that will either support or deny certain therapies.	It is not within our purview to make recommendations for how policymakers or other stakeholders should use the evidence in our review to draft policy or change practice, only to point out findings that might be relevant to decision making.
Reviewer: 7	Clarity and Usability	I suggest that since much of the literature is insufficient for a declarative perspective, that this is not directly helpful with high influence on policy decisions. Conclusions can certainly inform clinical decisions, especially some which are based on unsubstantiated myth.	Thank you for this comment.
Reviewer: 7	Clarity and Usability	As mentioned previously, the report is very well structured and organized and I very much enjoyed reviewing this work.	Thank you for your comment. We appreciate the feedback.
Reviewer: 8	Clarity and Usability	The report is well written and organized. The difficulty at present is the state of the science--it seems lacking in strength to provide much in the way of policy guidance or practice guidance. That is why recommendations about extending the science base are critical. If we do not understand how to improve the science we will continue to expend resources but learn vary little that will translate into effective care for patients with pressure ulcers and better outcomes.	Thank you for your comment, we appreciate the feedback. We feel it is important to note that we our report is meant to be a summary of the evidence and not a recommendation or guideline for treatment. The American College of Physicians will use the evidence report in the development of clinical guidelines for the treatment of pressure ulcers.
Reviewer: 9	Clarity and Usability	The report is very well structured	Thank you.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 9	Clarity and Usability	The reviewers suggest that the conclusions do not offer clear guidance for practice and policy makers, this is due to the lack of sound methodologically conducted robust studies. In the absence of this the reviewers might consider suggesting what guidance can be offered.	As authors of a systematic review, our task is to synthesize the literature. Guidance outside what can be drawn from the literature needs to be offered by expert panels that develop guidelines.
Reviewer: 10	Clarity and Usability	Overall, this SR was very well organized and followed a logical progression of thought and rigorous analysis process.	Thank you for your comment, we appreciate the feedback.
Reviewer: 10	Clarity and Usability	The conclusions of the authors support previous SR on this topic: more robust research is needed to evaluate the effectiveness of current PU treatment methods.	Thank you for this comment.
Reviewer: 10	Clarity and Usability	The usefulness of this SR to inform policy and practice decisions is limited due to the lack of evidence pertaining to the authors clinical question.	We agree that our review might be most useful in informing future research, due to the relative lack of high-quality evidence.
APTA	Clarity and Usability	We feel that there is a need for greater clarity around several definitions in this report. The definition of “unstageable” and suspected deep tissue injury” pressure ulcers should be included in the report. In addition, some of the verbiage included in the staging definitions did not outline all the expanded staging details as defined by the EPUAP and the NPUAP.1 Obviously, the staging of an ulcer may impact the efficacy of treatments and therefore is an essential first step in the treatment process.	Thank you for your comment. We have added to our figure and descriptions of NPUAP staging.
Catherine Ratliff	Clarity and Usability	good	Thank you for your comment.

Commentator & Affiliation	Section	Comment	Response
Laura Bolton	Clarity and Usability	AP: alternating pressure (active) AF: air fluidized PU: pressure ulcer	Thank you. These have been added to the list.
Reviewer: 4	Appendix	Table in Appendix G, Page G-1: LAL strength of evidence rated as Moderate despite poor quality, moderate consistency, and unclear precision, yet other interventions assessed as Low SOE with Fair quality, moderate consistency and low precision, and another as Low SOE with Poor Quality, Moderate consistency and Low precision. That seems inconsistent to me. Was there some other factor you incorporated into your judgment about LAL? Why was the precision rating "unclear"?	The SOE assessments have been reviewed and revised. However, the overall grades are not linear combinations of the criteria. They are assessments of our confidence informed by the criteria. Precision was initially graded as unclear because many studies did not provide variance information. This has been changed to Low in order to make the ratings more consistent.
Reviewer: 4	Appendix	What was the ROB/Quality of the mixed nutritional supplements studies? (missing from Table in Appendix G, page G-1)	Due to ambiguity about the category of mixed supplements, we have eliminated that category and added those studies to the category of protein-based supplements. The Summary Of Evidence ratings have been revised to reflect this change. The quality for protein supplements was rated as Fair.
Reviewer: 10	Appendix	So many tables seemed somewhat confusing and required the reader to flip back and forth searching between tables if they wish to gather more info on one particular study. For instance, page 71, the study by van Anholt, 2010 is described also on H41, H43, H44, H46 and H53 (it would be helpful to have documented p values for results listed in tables – did not see them reported consistently).	Thank you for providing feedback on the tables. We have revised the tables to enhance the usability of the tables. With regards to the inconsistent reporting of p-values, we have indicated p-values where the studies have provided them but we did not calculate the p-values for studies that did not publish a statistical significance level. Because p-values were published inconsistently in the studies there are instances where p-values are reported for some studies but unavailable for other studies.
Catherine Ratliff	Appendix	include all of npuap stagins system PUSH Tool?	We have changed the figure for the NPUAP staging system.

Commentator & Affiliation	Section	Comment	Response
NPUAP	Appendix	The information contained in the Structured Abstract , Executive Summary and body of the paper is very similar-perhaps it could be condensed to create a less formidable, more useable document. Even the studies rated as 'good' frequently have low numbers of patients and many sites; many of the studies resemble pilot studies-further complicating the task. NPUAP would be honored to collaborate with AHRQ in addressing some of the above cited concerns in greater detail than is permitted by the limited commentary section.	We appreciate the offer of collaboration to heighten the impact of the report. The abstract, Executive Summary and full text are often presented separately and therefore are redundant by design.
Reviewer: 10	Figures and Tables	Figure 4 - Study Flow Diagram, is helpful to readers to follow the researcher's process	Thank you for your comment.
Reviewer: 10	Figures and Tables	Tables could be clearer- seems like multiple table formats were used to report data; in addition, some listed the treatments and others listed "Treatment A" vs. "Treatment B" while others listed the actual intervention product and the comparator - would make more sense to list exactly what intervention and comparator were used in each study in all tables.	Thank you for your comment. We have revised our tables for clarity and consistency.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 10	Figures and Tables	In addition, the tables with "Benefit Wound Healing" as an outcome with + or ++ was more useful from a clinician standpoint, but as far as overall evidence to support wound care decisions, it was confusing how a clinician might use this table in light of the evidence tables. Perhaps a clinican's guide to using the information in the tables would be helpful? *Stem and leaf plots of pooled results were very useful but they were not reported for all categories – I wish they were used more frequently/consistently.	In order to make the evidence clinically relevant, the Eisenberg Center will develop a clinician's guide based on this review. Results of quantitative meta analyses are reported using the plots mentioned. Unfortunately this type of analysis was not possible for all treatments based on the types of studies and the data available. This explains why they are not used more frequently.
Reviewer: 10	Figures and Tables	One comment about Figure B on Author's page ES2 - this does not appear to be the most recent NPUAP/EPUAP 2009 PU staging info (Stage/Category I, II, III, IV, DTI, Unstageable - I wonder if all should be listed for accuracy?)	Thank you, they are now all listed in Figure B of the executive summary and Figure two of the main report.
Abbott	Figures and Tables	The Key Question addressed in Table A: Summary of evidence (page ES-14) and Table 16 (page 103) is "In adults with pressure ulcers, what is the comparative effectiveness of treatment strategies for improved health outcomes including but not limited to: complete wound healing, healing time, reduced wound surface area, pain, and prevention of serious complications of infection?" Based upon the AHRQ report no treatments achieved complete wound healing so we recommend that is important for the report conclusions summary of evidence to be consistent so as to	We have changed the wording of our key findings.

Commentator & Affiliation	Section	Comment	Response
		not inadvertently provide bias. For example, Mixed Nutritional Supplementation Research is summarized as "The study quality was generally low across studies of mixed nutritional supplementation, Studies reported small benefits in the reduction of wound size and reduced healing time, but there was no evidence of benefit in terms of complete wound healing." On the other hand, Air Fluidized Beds research is summarized as "Five studies that involved comparing air-fluidized beds to other surfaces all reported better healing in terms of reduction in PU size or stage on air-fluidized beds." There is no reference to benefit in terms of complete wound healing. As the Key Question states "including but not limited to", we recommend that AHRQ maintain consistency between the findings and conclusions summaries of all treatments reviewed in the report. We recommend AHRQ summarize Mixed Nutritional Supplementation Research in Table A (page ES-14) and in Table 16 (page 103) with the following statement "The study quality was generally low across studies of mixed nutritional supplementation; Studies reported small benefits in the reduction of wound size and reduced healing time".	

Commentator & Affiliation	Section	Comment	Response
AAWC	Figures and Tables	ES-4 Fig C: It is unclear whether Infection listed as a harm is wound infection or sepsis. It may be clearer to divide Outcomes into "Benefits" and "Harms" to match Institute of Medicine criteria for a good guideline, simplifying the diagram.	The diagram follows standard guidance for AHRQ analytic frameworks.
AAWC	Figures and Tables	Page 6 Fig 3 : Same comments as #3 above. Please use relevant comments above to refer to corresponding sections in Methods, Results, Discussion.	The diagram follows standard guidance for AHRQ analytic frameworks.
Catherine Ratliff	Figures and Tables	wonder why only 4 NPUAP stages included;not unstageable and deep tissue injury	We have changed the figure and descriptions of the NPUAP staging system.
James Adamson	Figures and Tables	very repetitive; many of the tables seem to present the same information which dilutes the impact of the paper	Thank you for your comment. We have revised the tables in order to present the data in a more clear and usable manner.
Catherine Ratliff	Figures and Tables	fine	Thank you for your comment.
James Adamson	Figures and Tables	OK	Thank you for your comment.
James Adamson	Figures and Tables	very repetitive; many of the tables seem to present the same information which dilutes the impact of the paper	Thank you for your comment. We have revised the tables in order to present the data in a more clear and usable manner.
NPAUP	Figures and Tables	The Adjunctive Therapy Tables (13-15) starting on page 87 lack the 'quality' evaluation in the first column.	Thank you noting this. We have corrected this in the report.

Commentator & Affiliation	Section	Comment	Response
NPAUP	Figures and Tables	In addition, the methodology for selecting documents led toa rating of 'insufficient evidence' of harm (p 108) for NPWT despite warnings from the FDA in 2009, 2011 and 2012. This should not be construed to imply that NPWT should not be used but rather that it warrants attention and monitoring unlike most topical dressings.	Thank for this comment. We have added information on the FDA warning in the harms section for NPWT.
Catherine Ratliff	References	good	Thank you for your comment.
James Adamson	References	Many of the references are more than 10 years old; this would not be advised in most publications	Thank you for your comment. We based our search on studies from 1985 to present based on recommendations from our TEP who suggested this time frame would appropriately capture relevant studies. We agree that much of the literature seems dated. However, restricting our search to studies from the past ten years only would have eliminated a large number of studies assessed by other recent systematic reviews.
Reviewer: 8	Additional Comments	A tremendous amount of work has gone into the creation of this report. It is comprehensive and will be read by many individuals both in practice and those doing research in pressure ulcer treatment. This will be a strong contribution to existing resources but I would like to see more specifics in the area of guidance for future research. The authors have a comprehensive view of what is lacking and need to help us in improving the science, through better design and methods.	Thank you for this comment.
Abbott	Additional Comments	The AHRQ report Pressure Ulcer Treatment Strategies: A Comparative Effectiveness Review, as well as other published materials [5, 6]; recognize that malnourished patients have an elevated risk of developing pressure ulcers. Thus, it is not surprising that many patients with	We have re-organized the categories of nutritional supplements and have merged two of the categories into one. We agree with this comment that the larger group of studies does show a consistent finding of faster wound healing with protein-based supplements. We increased the strength of evidence of this conclusion to Moderate (formerly rated as Low).

Commentator & Affiliation	Section	Comment	Response
		pressure ulcers are already malnourished. Their nutrition status is often further compromised by the elevated calorie and protein needs of their condition [7, 8]. Given the high level of malnutrition in patients with pressure ulcers, nutrition supplementation has been a standard treatment strategy to help improve nutrition status [9], improve pressure ulcer healing, and ultimately prevent further complications-- especially the development of additional pressure ulcers [10]. Unequivocally demonstrating these benefits at the very high strength of evidence level defined by the AHRQ report is difficult because of the complex nature of nutrition research, pressure ulcer development, and pressure ulcer healing. First, adequate nutrition is essential for life and thus it is as fundamental for the effective recovery from a disease or medical condition as it is for the effective outcome from a medical therapy. Second, prospective, randomized clinically controlled trials of nutrition supplementation are often difficult or impossible to complete because it is unethical to withhold feeding. Third, in the scientific literature nutrition supplementation is often used as a broad term that includes a wide range of nutrition interventions and specific nutrients; this contributes to considerable variability among findings. For studies of pressure ulcer patients,	

Commentator & Affiliation	Section	Comment	Response
		this variability is further exacerbated by the lack of a standardized measure of pressure ulcer healing and the difficulty of achieving the endpoint of complete pressure ulcer healing. Despite these difficulties, The AHRQ report found that studies of the supplementation of at least one macronutrient resulted in improvements in both wound size [11-18] and the speed of wound healing[12-14, 17, 19, 20], with greater reductions seen in those groups given the largest quantity of nutrition supplementation [13] and the most comprehensive nutrition [21]. In addition to these studies, Benati and colleagues [22] concluded that nutrition supplementation provided "a more rapid improvement in pressure ulcer healing." In summary, of the specific studies reviewed in the AHRQ report, 12 out of the13 that provided additional macronutrients found a benefit in pressure ulcer healing. Given the difficulties in conducting nutrition research in this population, this represents a very high level of consistency.	
Abbott	Additional Comments	While many of these studies did not monitor patients for a long enough time period to capture complete wound closure, the AHRQ report recognizes that wound size reduction represents an "intermediate step towards the principal outcome of complete wound healing" and that "the likelihood of complete wound	See comment above that addresses this concern. We appreciate these comments and agree with the need for further research with longer follow-up periods.

Commentator & Affiliation	Section	Comment	Response
		healing is lower for larger ulcers." Consistent with these assumptions, a recent review article on nutrition supplementation for the prevention and treatment of pressure ulcers [23] stated that "medical nutrition therapy is imperative for the prevention and treatment of pressure ulcers." The AHRQ report also emphasizes that any effective treatment strategy should also minimize the risk of complications. Nutrition supplementation is a low-risk, non-prescription therapy for pressure ulcers. In most of the studies reviewed in the AHRQ report, patients with pressure ulcers receiving nutrition supplementation were no more likely to experience an adverse event. Further, when adverse events did occur they were reported as transient in nature. In summary, nutrition supplementation helps provide protein and energy that is necessary for life, helps prevent additional complications, and represents a low-risk and low-cost treatment strategy. All of these contributions make it a valuable treatment strategy for pressure ulcers. The studies reviewed in the AHRQ report that provided additional macronutrients showed a positive benefit in pressure ulcer healing in 12 of 13 instances. As with other treatment modalities, further research following patients	

Commentator & Affiliation	Section	Comment	Response
		for a longer period of time is needed to evaluate impact on complete wound healing.	
Hill-Rom	Additional Comments	Hill-Rom representatives have reviewed AHRQ's Comparative Effectiveness Reviews for Pressure Ulcer Prevention and Treatment and respectfully submit our comments below. As a leader in the development, manufacture and supply of wound support surfaces, we are troubled that the Agency's conclusions, which understate the clinical value of low air loss (LAL) surfaces, are based on relatively poor quality studies and obsolete products. We are concerned that these conclusions will create obstacles for patients to receive the most effective and efficient treatment available to them.	Please see the response to other comments above. We have expanded the discussion of the limitations of the available research and agree more research is needed. However, based on the published literature that is available and met the inclusion criteria for our report, we believe a stronger conclusion is not possible.

Commentator & Affiliation	Section	Comment	Response
Hill-Rom	Additional Comments	*Other concerns* The terminology on page 17 is outdated, not consistent with NPUAP/EPUAP, and inconsistent with the terminology used in the Prevention document that will typically be used by the same readers. Although there is an acknowledgement that there is no universally accepted terminology for support surfaces, the statement that "There is significant overlap with non-powered, often equivalent to CLP, and low tech" is inaccurate and should be corrected based on current technology. In essence, this lumps continuous (low) pressure into the "other" category. Later on p. 25 during the conclusions of "other surfaces", the studies related to "other" support surfaces are in no way comparable to continuous (low) pressure as defined by us and others in the industry. All studies in this section are from 2003 and earlier.	This statement in the report describes how surfaces have been classified in prior reviews and is not meant to endorse this classification. We used similar classification in order to allow comparisons with past results. We also referred to surfaces as they were defined by the researchers in their articles. We have added additional information about when studies were published specifically to clarify that a limitation is that the research is not current.
Hill-Rom	Additional Comments	*Application to MCM Products* In particular, the agency's generalization to the entire class of microclimate management(MCM) products seems inappropriate based on a narrow and partially obsolete sampleand could be misleading to consumers. As we indicated in our initial submitted response("Grey Data"), we have tested dozens of products in our laboratory using a microclimatemanagement test that has been validated and approved by the NPUAP's Support Surface	We appreciate your submission, but the lab data do not meet our inclusion criteria as they do not report patient outcomes for people with pressure ulcers.

Commentator & Affiliation	Section	Comment	Response
		Standards Initiative (S3I). These results, which were submitted to AHRQ, indicated thatthere are significant differences in performance between products that are referred to bytheir manufacturers as having low air-loss or microclimate management capabilities. According to S3I, LAL products are defined as those that, “provide a flow of air to manage the heat and humidity (microclimate) of the skin.” They are therefore evaluated for their ability to withdraw heat and moisture from the skin and the performances ineach category vary tremendously. For example, in the results of the twelve LAL surfaces we submitted to AHRQ, evaporative capacities varied between 13 and 136 g/m2-hr and estimated skin-cooling capability varied from less than 2.0o F to more than 10.0o F. Itwould certainly be reasonable to expect these surfaces to have very different effects on the body. Nevertheless, your broad conclusion, implying that the field of MCM products available today offer no benefit because the small sample of older products showed little benefit is misleading to caregivers. We do not believe the narrow sample allows for such a definitive general conclusion that applies to the MCM products available in 2012.	

Commentator & Affiliation	Section	Comment	Response
NPAUP	Additional Comments	This document can serve as a scaffolding on which to build improved information regarding comparative effectiveness of PU treatments through continuous literature review as better quality studies become available. In summary, we do not find any factual errors or significant oversights. Our comments and suggestions are meant to provideconsistency and cohesion to the document. The above correction will produce a valuable document for clinician and academicians. Thank you for the opportunity to participate in the comment period for ARHQ's Pressure Ulcer Treatment Strategies: A Comparative Effectiveness Review.	Thank you for this comment.
Reviewer: 4	Cited References	1.Lahmann NA, Tannen A, Dassen T, Kottner J. Friction and shear highly associated with pressure ulcers of residents in long-term care - Classification Tree Analysis (CHAID) of 2. 2. Braden items. J Eval Clin Pract. 2011 Feb;17(1):168-73. doi: 10.1111/j.1365-2753.2010.01417.x. Epub 2010 Sep 12. Department of Nursing Science, Charité- Universitätsmedizin Berlin, Berlin, Germany. nils.lahmann@charite.de	We reviewed this reference for our report but it did not meet the inclusion criteria since the focus of the study was prevention of pressure ulcers.

Commentator & Affiliation	Section	Comment	Response
Reviewer: 4	Cited References	*Ceelen KK, Stekelenburg A, Loerakker S, Strijkers GJ, Bader DL, Nicolay K, Baaijens FP, Oomens CW. Compression-induced damage and internal tissue strains are related. J Biomech. 2008 Dec 5;41(16):3399-404. Epub 2008 Nov 17.	We reviewed this reference for our report but it did not meet the inclusion criteria for study populations.
Laura Bolton	Cited References	1.Prevention and Treatment of pressure ulcers: clinical practice guideline. NPUAP 2009; p10. www.npuap.org 2. National Institute for Health and Clinical Excellence (NICE). The management of pressure ulcers in primary and secondary care. www.nice.org.uk/cg29. 2005. Section 1.3.4: p13 3. McInnes E, Dumville JC, Jammali-Blasi A, et al. Support surfaces for treating pressure ulcers. Cochrane Database of Systematic Reviews 2011, Issue 12. Art. No.: CD009490. DOI: 10.1002/14651858.CD00949 0. 4. Krouskop TA, Williams R, Krebs M et al. Effectiveness of mattress overlays in reducing interface pressures during recumbency. Journ. Rehab. Res. 1985; 22(3): 7-10 5. Clark M. Retrospective Versus Prospective Cohort Study Designs for Evaluating Treatment of Pressure Ulcer. A Comparison of 2 Studies. J Wound Ostomy Continence Nurs. 2008; 35(4):391-394 6. NPUAP. Support surfaces terms and definitions. www.npuap.org 7. Air-Fluidized Beds Used for	Thank you for suggesting additional literature for review. We have evaluated the suggested references and many were previously considered but did not meet our inclusion criteria. For transparency, we have provided the results of our review of these studies below. 1. Included in the report as background and cited in the draft 2. Background 3. Systematic Review not directly used 4. Excluded - at abstract, dual review phase, did not meet our predefined inclusion criteria. 5. Excluded - at abstract dual review phase, did not meet our predefined inclusion criteria. 6. Background 7. Systematic Review not directly used 8. Wrong population 9. Wrong population 10. Wrong population 11. Excluded - at abstract, dual review phase, did not meet our predefined inclusion criteria. 12. Excluded - at abstract 13. Excluded background 14. Excluded background 15. Included in the report, 1 - Support Surfaces 16. excluded background

Commentator & Affiliation	Section	Comment	Response
		Treatment of Pressure Ulcers in the Home Environment. Health Care Technology Assessment. ECRI 2001. 8.CMS Decision Memo for air-fluidized beds for pressure ulcers: CAG- 00017R. www.cms.gov. accessed June 2012 9. Finnegan MJ, Gazzerro L, Finnegan JO et al. Comparing the effectiveness of a specialized alternating air pressure mattress replacement and an airfluidized integrated bed in the management of postoperative flap patients: a randomized controlled pilot study. Journ. Tiss. Viab. 2008; 17(1): 2-9 10. Wallenstein S, Carasa M Kapil-Pair N. Defining the rate of healing of pressure ulcers. 2002. EPUAP 11. Brem et al. Healing of diabetic foot ulcers and pressure ulcers with human skin equivalent: a new paradigm in wound healing. Archives of Surgery. 2000;135(6:627-634 12. Clark M, Benbow M, Butcher M et al. Collecting pressure ulcer prevention and management outcomes. Brit. Journ. Nurs. 2002; 11(4): 230-238 13. Clark M. Models of pressure ulcer care: costs and outcomes. Brit. Journ. Healthcare. Man. 2001: 7(10): 412- 416 14. Fleurence RL. Costeffectiveness of pressurerelieving devices for the prevention and treatment of pressure ulcers. Int. Journ. Tech. Ass. in Healthcare. 2005; 21(3):	

Commentator & Affiliation	Section	Comment	Response
		334-341 15Malbrain M, Hendriks B, Wijnands P et al. A pilot randomised controlled trial comparing reactive air and active alternating pressure mattresses in the prevention and treatment of pressure ulcers among medical ICU patients. Journ. Tiss. Viab. 2010; 19(1): 7-15 16. Phillips L.Cost-effective strategy for managing pressure ulcers in critical care: a prospective, non-randomised, cohort study. Journal of Tissue Viability; 2000. p. 2-6	

Commentator & Affiliation	Section	Comment	Response
Abbott	Cited References	1. Reddy M, Gill SS, Kalkar SR, Wu W, Anderson PJ, Rochon PA: Treatment of pressure ulcers: a systematic review. JAMA 2008, 300(22):2647-2662. 2. Schneider SM, Veyres P, Pivot X, Soummer AM, Jambou P, Filippi J, van Obberghen E, Hebuterne X: Malnutrition is an independent factor associated with nosocomial infections. Br J Nutr 2004, 92(1):105-111. 3. Paillaud E, Herbaud S, Caillet P, Lejonc JL, Campillo B, Bories PN: Relations between undernutrition and nosocomial infections in elderly patients. Age Ageing 2005, 34(6):619-625. 4. Naber TH, Schermer T, de Bree A, Nusteling K, Eggink L, Kruimel JW, Bakkeren J, van Heereveld H, Katan MB: Prevalence of malnutrition in nonsurgical hospitalized patients and its association with disease complications. Am J Clin Nutr 1997, 66(5):1232-1239. 5. Russell L: Malnutrition and pressure ulcers: nutritional assessment tools. Br J Nurs 2000, 9(4):194-196, 198, 200 passim. 6. Dorner B, Posthauer ME, Thomas D: The role of nutrition in pressure ulcer prevention and treatment: National Pressure Ulcer Advisory Panel white paper. Adv Skin Wound Care 2009, 22(5):212-221. 7. Posthauer ME: The role of nutrition in wound care. Adv Skin Wound Care 2006, 19(1):43-52; quiz 53-44.	1. Included in the report as background cited in the draft 2. Excluded - Wrong population 3. Excluded -Wrong population 4. Excluded -Wrong population 5. Excluded -Wrong population 6. Excluded - at abstract, dual review phase, did not meet our predefined inclusion criteria. 7. Excluded -No original data

Commentator & Affiliation	Section	Comment	Response
Abbott	Cited References	8. Liu MH, Spungen AM, Fink L, Losada M, Bauman WA: Increased energy needs in patients with quadriplegia and pressure ulcers. Adv Wound Care 1996, 9(3):41-45. 9. United States. Treatment of Pressure Ulcers Guideline Panel., Bergstrom N: Treatment of pressure ulcers. Rockville, Md.: U.S. Dept. of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research; 1994. 10. Stratton RJ, Ek AC, Engfer M, Moore Z, Rigby P, Wolfe R, Elia M: Enteral nutritional support in prevention and treatment of pressure ulcers: a systematic review and meta-analysis. Ageing Res Rev 2005, 4(3):422-450. 11. Cereda E, Gini A, Pedrolli C, Vanotti A: Disease-specific, versus standard, nutritional support for the treatment of pressure ulcers in institutionalized older adults: a randomized controlled trial. J Am Geriatr Soc 2009, 57(8):1395-1402. 12. Frias Soriano L, Lage Vazquez MA, Maristany CP, Xandri Graupera JM, Wouters-Wesseling W, Wagenaar L: The effectiveness of oral nutritional supplementation in the healing of pressure ulcers. J Wound Care 2004, 13(8):319-322. 13. Ohura T, Nakajo T, Okada S, Omura K, Adachi K: Evaluation of effects of nutrition intervention on healing of pressure ulcers and nutritional states (randomized controlled trial). Wound Repair Regen 2011, 19(3):330-336.	8. Excluded - at abstract dual review phase, did not meet our predefined inclusion criteria. 9. Background."Treatment of Pressure Ulcers Clinical Practice Guideline" is a book. 10. Systematic Review not directly used, but reviewed for references and background 11. Included in the report –Nutrition 12 .Included in the report –Nutrition 13. Included in the report –Nutrition 14. Included in the report -Nutrition

Commentator & Affiliation	Section	Comment	Response
		14. Barnes P, Jr., Sauter TE, Zaheri S: Subnormal prealbumin levels and wound healing. Tex Med 2007, 103(8):65-68.	
Anonymous comments based on AAWC Guidelines	Cited References	1 Hutchinson JJ, McGuckin M. Occlusive dressings: A microbiologic and clinical review. Amer J Infec Control 1990; 18(4):257-268. 2 Chaby G, Senet P, Vaneau M, Martel P, Guillaume JC, Meaume S, Téot L, Debure C,Dompmartin A, Bachelet H, Carsin H, Matz V, Richard JL, Rochet JM, Sales-Aussias N, Zagnoli A, Denis C, Guillot B, Chosidow O. Dressings for acute and chronic wounds: a systematic review. Arch Dermatol. 2007;143(10):1297-304. 3 Heyneman A, Beele H, Vanderwee K, Defloor T. A systematic review of the use of hydrocolloids in the treatment of pressure ulcers. J Clin Nurs. 2008;17(9):1164-73. 4 Kerstein MD, Gemmen E, van Rijswijk L, Lyder CH, Phillips T, Xakellis G, Golden K, Harrington C. Cost and cost effectiveness of venous and pressure ulcer protocols of care. Disease Management and Health Outcomes, 2001, 9(11):651-663. 5 Bolton L, McNees P, van Rijswijk L et al. Wound healing outcomes using standardized care JWOCN 2004; 31(3):65-71 6 Bouza C, Saz Z, Muñoz A, Amate JM. Efficacy of advanced dressings in the treatment of pressure ulcers: a systematic review. J Wound	1. Background 2. Background 3. Systematic Review not directly used 4. Excluded - at abstract dual review phase, did not meet our predefined inclusion criteria. 5. Excluded -Wrong intervention 6. Systematic Review not directly used 7. Excluded -Wrong population 8. Included in the report- Local wound applications

Commentator & Affiliation	Section	Comment	Response
		Care. 2005;14(5):193-9. (excluded from analysis as having no original data, but the meta-analysis appeared original.) 7 Wiechula R. The use of moist wound-healing dressings in the management of split-thickness skin graft donor sites: a systematic review. Int J Nurs Pract. 2003; 9:S9-S17. 8 Colwell, J., Foreman, M.D., Trotter, J.P.A Comparison of the Efficacy and Cost-Effectiveness of Two Methods of Managing Pressure Ulcers. Decubitus 1993;6(4):28-36.	