Comparative Effectiveness Research Review Disposition of Comments Report

Research Review Title: *Wheeled Mobility (Wheelchair) Service Delivery*

Draft review available for public comment from October 18, 2010 to November 15, 2010.

Research Review Citation: Greer N, Brasure M, Wilt TJ. Wheeled Mobility (Wheelchair) Service Delivery. Technical Brief No. 9. Prepared by the University of Minnesota Evidence-based Practice Center under Contract No. 290-07-10064-I.) AHRQ Publication No. 11(12)-EHC065-EF. Rockville, MD: Agency for Healthcare Research and Quality. January 2012. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.

Comments to Research Review

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

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Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #1	General	The purpose of the report is clearly stated and potentially is of great importance. Unfortunately, the report isn't clinically meaningful due to either inadequate specification of the targeted population to whom the report is directed or very incomplete description of the prevalent service models for wheelchair delivery. The audience, therefore, is unclear (and isn't defined beyond "stakeholders"). The questions are clearly stated but the methods and results do not really address the stated questions. In my opinion, this report needs to either considerably expand the review of the literature and expert panel and speak to the diverse practices of wheelchair provision (e.g., medical model, rehabilitation model, infrastructure model, private consumer model) or explicitly limit the population to whom this report would apply to long-term wheelchair users with complex rehabilitation needs.	Thank you. We clarified that the focus is on long-term wheelchair users with complex rehabilitation needs.
Peer Reviewer #2	General	As the authors so clearly articulated, the use of wheeled mobility devices in the US is growing. The report accurately portrays the multi-factorial challenges in providing quality services and products to an often under resourced patient population, namely the long-term disabled in the US. While the report stresses the urgent need for quality research to provide evidence to support the "ideally" recommended components for effective service delivery; the challenges of the current environment are quite accurately portrayed.	Thank you.
Peer Reviewer #3	General	I think that the "weight" of this article comes from the fact that AHRQ commissioned it. I do very much appreciate the time and effort that went into the report. However I do not believe that it was appropriately balanced. If the goal of the report was to "describe the wheeled mobility service delivery process from various perspectives"....I am not certain that the base of your key experts was broad enough. I would like to have seen input not only from Medicare, Medicaid and private insurers, but also to be fair, both large and small suppliers as well as providers of all types (e.g. physicians, etc of different disciplines and settings like private practice/academia/rural/etc). I think that would have provided the information needed as to the existence (or non existence) of the various types of decision making processes that are being used in everyday practice.	We attempted to include representatives from all the areas you mention. The report was also posted for Peer and public review.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #4	General	The report is clinically meaningful in that it describes the service delivery process for wheeled mobility and the weakest link in the process – the lack of wide utilization of tools to measure the outcomes of the various service delivery models described.	Thank you.
Peer Reviewer #4	General	The report lacks clarity and precision in that in that it does not adequately distinguish between Complex Rehab Technology and Standard DME.	We clarified that the focus is on long-term wheelchair users with complex rehabilitation needs.
Peer Reviewer #4	General	The definition of Complex Rehab Technology as delineating in a document entitled "Proposal to Create a Separate Benefit Category for Complex Rehab Technology" (a copy of the full proposal is appended to these comments) is: Exhibit 1 – Complex Rehab Technology Definition The Products Complex Rehab Technology (CRT) products and associated services include medically necessary, individually configured devices that require evaluation, configuration, fitting, adjustment or programming. These products and services are designed to meet the specific and unique medical, physical, and functional needs of an individual with a primary diagnosis resulting from a congenital disorder, progressive or degenerative neuromuscular disease, or from certain types of injury or trauma. For purposes of this document, CRT refers to individually configured manual wheelchair systems, power wheelchair systems, adaptive seating systems, alternative positioning systems and other mobility devices. The Person These products and services are designed to meet the specific and unique medical and functional needs of an individual with a primary diagnosis resulting from a congenital disorder, progressive or degenerative neuromuscular disease, or from certain types of injury or trauma. The primary diagnoses that can require CRT include: • Spinal Cord Injury; or • Anterior horn cell diseases; or • Traumatic Brain Injury; or • Post-Polio Syndrome; or • Cerebral Palsy; or	Thank you for this information. We incorporated the definition into the text of the report. We recognize the importance of postural seating and positioning and have noted this in the text. The focus of the report, however, is on the overall process of service delivery rather than specific wheeled mobility components.

Commentator & Affiliation	Section	Comment	Response
		• Cerebellar degeneration; or • Muscular Dystrophy; or • Dystonia; or • Spina Bifida; or • Huntington's disease; or • Osteogenesis Imperfecta; or • Spinocerebellar disease; or • Arthrogryposis; or • Certain types of amputation; or • Amyotrophic Lateral Sclerosis; or • Paralysis or paresis; or • Multiple Sclerosis; or • Demyelinating diseases; or • Myelopathy; or • Myopathy; or • Progressive Muscular Atrophy; or • Other disability or disease that is determined through individual consideration to require the use of such individually configured products and services The Process In establishing a person's need for CRT products and services, consideration is always given to the person's immediate and anticipated medical and functional needs. These needs include, but are not be limited to, activities of daily living (ADLs), instrumental activities of daily living (IADLs), functional mobility, positioning, pressure redistribution, and communication. CRT is used to address these needs and enable the individual to accomplish these tasks safely, timely, and as independently as possible in all environments the individual is expected to encounter. The provision of CRT consists of two interrelated components: • The clinical component of providing CRT includes the physical and functional evaluation, treatment plan, goal setting, preliminary device feature determination, trials/simulations, fittings, function related training, determination of outcomes and related follow-up. The clinical team is responsible for the prescription and supporting medical documentation. • The technology-related component of providing CRT includes, as appropriate: evaluation of the home environment; transportation assessment; technology assessment; equipment demonstration/trial/simulation;	

Commentator & Affiliation	Section	Comment	Response
		product feature matching to identified medical, physical, and functional needs; system configuration; fitting; adjustments; programming; and product related training and follow-up. The Professionals The provision of CRT is done through an interdisciplinary team consisting of, at a minimum, a Physician, a Physical Therapist or Occupational Therapist, and a Rehab Technology Professional (referred to as the CRT Team). The team collectively provides clinical services and technology related services. An individual's medical and functional needs are identified by the clinical team. These needs are then matched to products and configured into custom designed systems by the Rehab Technology Professional with input from the clinical team. • The clinical CRT services are provided by a licensed/ certified Physical Therapist or Occupational Therapist. • The technology-related CRT services are provided by a certified, registered or otherwise credentialed Rehab Technology Professional. The Credentials CRT products must be provided by individuals who are certified, registered or otherwise credentialed by recognized organizations in the field of CRT and who are employed by a business specifically accredited by a CMS deemed accreditation organization to provide CRT. The report also lacks some clinical significance in that it does adequately recognize the impact that appropriate postural seating and positioning in wheeled mobility bases has on appropriate clinical outcomes and patient satisfaction.	
Peer Reviewer #5	General	The broad conclusions of the manuscript are reasonably accurate. However, the study has several serious limitations that dramatically reduce the utility of the information presented. The authors have made two potentially fatal flaws: (1) they have included only a very limited number of source materials by either not identifying or eliminating essential material from the manuscript; and (2) the "experts" interviewed represents a very small sample of individuals, which is not representative of practicing clinicians, wheelchair users, active wheelchair suppliers,	We reviewed the list of guideline sources and references provided and have included those that met our inclusion criteria. As noted above, we attempted to include representatives from the areas mentioned. The report was also posted for public and peer review. We recognize that there is a significant body of knowledge about wheelchair design and specific

Commentator & Affiliation	Section	Comment	Response
		manufacturers, payers, and scientists. Most of the individuals listed are only indirectly involved in wheelchair usage or service delivery. For example, clinicians involved in the NIDRR SCI Model Systems were not adequately represented. Key clinical practice guidelines were not adequately presented, for example, Consortium for Spinal Cord Injury Clinical Practice Guideline of "Upper Limb Preservation", VA clinical and prescription guidelines, and RESNA position papers. Further the ISO and ANSI/RESNA standards also influence clinical practice. A common flaw that appears in this manuscript is that research typically address a narrow set of hypotheses that only address specific aspects of clinical practice, but when taken in the aggregate have tremendous influence. It requires intimate knowledge of the field in order to be able to piece together the puzzle from the thousands of relevant sources. For example, wheelchair comparison studies may not appear to be relevant, but they define quality and help guide all stake holders in their decision making process. There is also a large and growing body of knowledge about prevention and treatment of secondary conditions related to wheelchair usage. These studies have had a tremendous positive impact on service delivery. Below are some papers that should have been carefully reviewed: An Introduction to Rehabilitation Engineering, Edited by Rory A.Cooper, Hisaichi Ohnabe H, and Doug Hobson, Taylor and Francis Group LLC, 2006. Liu H, Pearlman J, Cooper R, Hong E, Wang H, Salatin B, Cooper RA, Evaluation of Aluminum Ultralight Rigid Wheelchairs Using ANSI/RESNA Standards and Compared with Other Ultralight Wheelchairs, Journal of Rehabilitation Research and Development, Vol. 47, No. 5, pp. 441-446, 2010. Laferrier J, McFarland L, Boninger ML, Cooper RA, Reiber G, Wheeled Mobility: Factors Influencing Mobility and Assistive Technology in Veterans and Service Members with Major Traumatic Limb Loss from Vietnam and OIF/OEF Conflicts, Journal of Rehabilitation Research and Development, Vol. 47, No.4, pp. 349-360, 2010. Souza A, Kelleher A, Cooper R, Cooper RA, Iezzoni LI,	components that may influence provider decision making about specific components but the focus of the Technical Brief was on the overall process. We clarified that the Technical Brief is about service delivery for wheelchair users with complex rehab needs. We added information about other “team” members who could contribute to the service delivery process. We recognize that wheeled mobility is one form of assistive technology. Our focus was specifically on the wheeled mobility service delivery process. We also recognize the large volume of consumer information available and we attempted to integrate the consumer perspective through targeted searches and interviews with consumers in our key informant group. We believe that we have addressed the issues related to payment. It would not be possible to address all of the mixed payment combinations. In calling for randomized trials we are not recommending violating good clinical practice. The recommendation is for research about the service delivery process, not specific components.

Commentator & Affiliation	Section	Comment	Response
		Collins DM, Multiple Sclerosis and Mobility-Related Assistive Technology: A Systematic Review of the Literature, Journal of Rehabilitation Research and Development, Vol. 47, No. 3, pp. 213-224, 2010. Jefferds AN, Beyene NM, Upadhyay N, Shoker P, Pearlman J, Cooper RA, Wee J, The Current State of Mobility Technology Provision in Less-Resourced Countries, PM&R Clinics of North America, Vol. 21, No.1, pp. 221-242, 2010. McClure LA, Boninger ML, Oyster ML, Williams S, Houlihan B, Lieberman JA, Cooper RA, Wheelchair Repairs, Breakdowns, and Adverse Consequences for People With Traumatic Spinal Cord Injury, Archivesof Physical Medicine and Rehabilitation, Vol. 90, No. 12, pp. 2034-2038, 2009. Karmarkar A, Collins DM, Kelleher AR, Cooper RA, Satisfaction Related to Wheelchair Use in Older Adults in Both Nursing Homes and Community Dwelling, Disability and Rehabilitation: Assistive Technology, Vol. 4, No. 5, pp. 337-343, 2009. Liu HY, Cooper RA, Pearlman J, Cooper R, Connor S, Evaluation of Titanium Ultralight Manual Wheelchairs Using ANSI/RESNA Standards, Journal of Rehabilitation Research and Development, Vol.45, No. 9, pp. 1251-1268, 2008. Simpson RC, LoPresti E, Cooper RA, How Many People Need a Smart Wheelchair? Journal of Rehabilitation Research and Development, Vol. 45, No. 1, pp. 53-72, 2008. Cowan R, Boninger ML, Sawatzky BJ, Mazoyer BD, Cooper RA, Preliminary Outcomes of the SmartWheel Users' Group Database; a Proposed Framework for Clinicians to Objectively Evaluate Manual Wheelchair Propulsion, Archives of Physical Medicine and Rehabilitation, Vol. 89, No. 2, pp. 260-268, 2008. Ambrosio F, Boninger ML, Fitzgerald SG, Hubbard S, Schwid S, Cooper RA, A Comparison of Mobility Device Delivery Within the Veterans Administration for Individuals with Multiple Sclerosis and Individuals with a Spinal Cord	

Commentator & Affiliation	Section	Comment	Response
		Injury, Journal of Rehabilitation Research and Development, Vol. 44, No.5, pp. 693-702, 2007. Hubbard SL, Fitzgerald SG, Vogel B, Reker DM, Cooper RA, Boninger ML, Distribution and Cost of Wheelchairs and Scooters Provided by the Veterans Health Administration, Journal of Rehabilitation Research and Development, Vol. 44, No. 4, pp. 581-592, 2007. Hubbard S, Fitzgerald SG, Reker D, Boninger ML, Cooper RA, Demographic Characteristics of Veterans Who Received Wheelchairs and Scooters from Veterans Health Administration, Journal ofRehabilitation Research and Development, Vol. 43, No. 7, pp. 831-844, 2006. Fitzgerald SG, Collins DM, Cooper RA, Tolerico M, Kelleher AR, Hunt PC, Martin SG, Impink BG, Cooper R, Issues in the Maintenance and Repairs of Wheelchairs: A Pilot Study, Journal of Rehabilitation Research and Development, pp. 853-862, Vol. 42, No. 6, November/December 2005. Boninger ML, Koontz AM, Sisto SA, Dyson-Hudson TA, Chang M, Price R, Cooper RA, Pushrim Biomechanics and Injury Prevention in Spinal Cord Injury: Recommendations Based on CULP-SCI Investigations, Journal of Rehabilitation Research and Development, Vol. 42, No. 3 (Supplement 1), pp.9-20, May/June 2005. Chavez E, Boninger ML, Cooper R, SG Fitzgerald, D Gray, Cooper RA, Application of a Participation System to Assess the Influence of Assistive Technology on the Lives of People with Spinal Cord Injury, Archives of Physical Medicine and Rehabilitation, Vol. 85, No. 11, pp. 1854-1858, 2004. Hunt PC, Boninger ML, Cooper RA, Zafonte RD, Fitzgerald SG, Factors Associated with Wheelchair Type and Quality Among Individuals with Traumatic Spinal Cord Injury, Archives of Physical Medicine and Rehabilitation, Vol. 85, No. 11, pp. 1859-1864, 2004. What is striking in its absence is that there is world-wide agreement that the optimal service delivery team should consist of a physiatrist or similarly trained physician, a	

Commentator & Affiliation	Section	Comment	Response
		therapist (OT/PT/KT/RT), a rehabilitation technology supplier (RTS), a rehabilitation engineer (RE), and a rehabilitation counselor (RC). Unfortunately, it is difficult to fund the appropriate team of professionals given the current reimbursement climate. However, there are a number of papers that describe the roles of these professionals in wheelchair service delivery. Therefore, there are a wide variety of models deployed from purely supplier driven to purely physician driven, to models with various team members in between. The manuscript also misses the entire field of disability studies that has focused heavily on appropriate service delivery models; such as social-integration model, medical model, political model, consumer-oriented model, HAT model, and PHAATE model. The authors also seemed to go on the premise that wheelchair service delivery models are different from Assistive Technology service delivery models; when there are actually huge similarities. The consumer perspective is nearly entirely lost in the manuscript. The authors failed to adequately search consumer oriented web-sites, and periodicals. The manuscript fails to discuss the impact of payer policies. For example, payers require a physician prescription, often severely limit the type of therapist and the time that they can spend with a client. RTS's are paid through the product in most cases. Many payers don't cover RE's or RC's. The manuscript also doesn't address the issue of mixed payment sources, and clinicians integrating them with their various policy restrictions. Service delivery models are often not idealized because people work in the real-world. Research funding would be helpful, but it would require more funds than any agency or collection of agencies has been willing to provide in the past 30-years. For example, the authors recommend violating good clinical practice by initiating more randomized trials on service delivery. This would require asking clinicians to recommend technology that they know to be superior or inferior purely to prove a point that is widely known. Dr. Lee Kirby, whose work is not included, has also published extensively on clinician training in wheelchair provision, and outcomes. This manuscript contributes little to the scientific or clinical literature.	

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Peer Reviewer #6	General	Please see the uploaded attachment. The report is theoretically valuable but the content is suboptimal because it does not include important information from the literature. References and outcome measures are missing, and focus is put on opinion of interviewees which is not substantiated by any evidence.	We reviewed the suggested references and included those that met our inclusion criteria. We attempted to distinguish opinion from evidence-based findings throughout the text.
Peer Reviewer #6	General	RESNA is currently developing a peer-reviewed guide on the process of wheelchair service delivery which would be ideal to include in this paper. It may be worthwhile to expand dates of the search to include the RESNA paper when it is published, since it may contain much information deemed missing from the present search.	We contacted RESNA and learned that the work is not available to review at this time.
Peer Reviewer #6	General	One major problem in the theme of this paper is that it outlines and highlights the "experience" of the informants and not what is recommended necessarily by the broad academic community. In many instances this paper cites what "typically occurs" in clinic based on conversations with informants, rather than what is recommended in the literature. There is little justification as to how the informants were selected or why they should be considered representative of the academic community. A significant emphasis is placed on ATP credentialing and yet only one author is listed as being credentialed. Moreover, it is not clear whether any informants were actually wheeled mobility users themselves. Their input would also be valuable.	We attempted to include representatives from the community, academia, and Veterans Affairs. The report was also posted for Peer and public review. We reviewed and updated the credentials of our key informants. Two of the key informants are wheeled mobility users.
Peer Reviewer #6	General	Would avoid use of the term MRADL since this is an artificial term created by Medicare and not supported in the scientific literature.	Thank you. We made this change.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #6	General	Additional references missing from paper[1-4]: **1.** Dicianno BE, Tovey E. Power mobility device provision: understanding Medicare guidelines and advocating for clients. *Arch Phys Med Rehabil.* Jun 2007;88(6):807-816. **2.** Arva J, Paleg G, Lange M, et al. RESNA position on the application of wheelchair standing devices. *Assist Technol.* Fall 2009;21(3):161-168; quiz 169-171. **3.** Ambrosio F, Boninger ML, Fitzgerald SG, Hubbard SL, Schwid SR, Cooper RA. Comparison of mobility device delivery within Department of Veterans Affairs for individuals with multiple sclerosis versus spinal cord injury. *J Rehabil Res Dev.* 2007;44(5):693-701. **4.** Rosen L, Arva J, Furumasu J, et al. RESNA position on the application of power wheelchairs for pediatric users. *Assist Technol.* Winter 2009;21(4):218-225; quiz 228.	Thank you for these suggestions. We reviewed the references and included any that met our inclusion criteria.
Peer Reviewer #7	General	This report, while effort is apparent, does not provide sufficient clarity or meaningful conclusions to be appropriately used to develop clinical practice guidelines and other quality enhancement tools, or as a basis for reimbursement and coverage policies. This brief fails to meet its stated purpose of describing the wheeled mobility service delivery process, to outline the criteria used by stakeholders in decision-making. Furthermore, the brief did not provide a comprehensive list of the issues that impact the provision of wheeled mobility. I believe the shortcomings stem from the fact that assistive technology is used interchangeably with wheeled mobility. In addition, wheeled mobility is treated as a synonymous category of products that would presumably imply the same service delivery process. Standard mobility offers few options and features while complex rehab technologies offer a wide range of options and features and can be configured or modified to meet the unique needs of an individual. The processes required for complex rehab in assessing clients and matching technology to the medical and functional needs is more intense and time consuming. To provide meaningful information it is imperative for these technologies to be set apart based on the complexity of the technology, the typical complexity of clients, as well as the	We described the purpose of the Technical Brief product so that readers understand that these products cannot be used to develop practice guidelines. We removed “assistive technology” from the Brief except where appropriate and we have clarified that report is about wheeled mobility service delivery for wheelchair users with complex rehab needs. We recognize the role and responsibilities of the supplier and we have attempted to address that in the text. We added information about the “team” approach. While we are unable to change the questions at this point, we reviewed your comments and attempted to address your concerns in our findings.

Commentator & Affiliation	Section	Comment	Response
		common steps in the related service delivery process (See attachment regarding CRT steps) An additional deficit of the brief is the total absence of the issues faced by the supplier of the technology. In fact, in many areas of the brief the role of the supplier the responsibilities of the supplier are disappointedly missing. Moreover, while the brief references steps in the service delivery process, it fails to recognize that in the case of complex rehab wheeled mobility, a team approach is employed. It is important that the team be identified as well as the roles and responsibilities involved in the process. This impacts the key questions; confusion and lack of clarity are the result of inadequate definition. 1) Question 1. Technology- uses the word "assessors"- I am confused as to which party this word is describing. Are you referring to the therapist or physician that may be performing a physical evaluation or the technology professional working for the supplier that may be performing a technology assessment? 2) I suggest forming a more complete question (a) by taking your words from above and making this question state the following…What formal criteria exist for determining the appropriateness and medical necessity of a wheelchair type? 3) Question 1 b- same as above, the term "assessor" is confusing to me. Again, the role of the supplier is noticeably absent. 4) I recommend adding another question (e) How do the criteria differ for patients depending on diagnosis, function and goals set by the professional medical team? 5) Question 2 Context. For part (b) I suggest adding in the parenthetical "knowledge of wheeled mobility and features and options available" 6) Question 2 (c) Setting- Is this the setting for the provider to perform physical evaluations or a possible setting for the technology assessment? This needs to be clarified. I don't believe a retail setting is a routine setting for physical evaluations. 7) Question 2 (d) this question may be clearer if it focused on the coverage and payment policies of the payer. 8) Question 2 (f) Assessment, prescription, and	

Commentator & Affiliation	Section	Comment	Response
		delivery steps… Should be stated as "technology assessment" 9) Question 2- Recommend adding (g) Supplier qualifications- (i.e., certification, experience performing technology assessments) 10) Question 3. Evidence. (e) Adverse events/harms/safety issues- I suggest revising to state "need for repairs or replacement beyond those anticipated to result from normal wear and tear".	
Peer Reviewer #1	General	Clarity/Useablity: The report is well structured and organized. The main points are clearly presented. Unfortunately, due to the aforementioned oversights and limitations, the conclusions cannot be relied on to broadly inform policy or practice decisions.	Thank you. Please see comment above.
Peer Reviewer #2	General	Clarity/Useablity: This was a well constructed clearly presented review of professional oriented literature findings describing wheelchair service delivery. As a professional involved in the area of wheelchair service delivery, the brief did an excellent job describing the current environment, which is a complex service delivery model with many stakeholders. The brief is an excellent resource which articulates the critical need for further research to support the best balance of resource allocation and the functional independence of persons relying on wheeled devices as their primary means of mobility.	Thank you.
Peer Reviewer #3	General	Clarity/Useablity: I found the organization of the report to be problematic. I think it would be more helpful to pose and then answer the questions in C directly. This would allow the reader more opportunity to distinguish fact from opinion from guidelines, as well as individual vs consensus thought processes. Yes the references are there, but the in the body of the report this information is difficult to tease out at times.	We attempted to clarify the flow of the document with textual mapping, however the format is predetermined to be consistent across all Technical Briefs.
Peer Reviewer #4	General	Clarity/Useablity: Taking into account the weaknesses described above, I believe that this report will be extremely valuable in promoting consistent application of standardized outcome measures to determine the effectives of seating and wheeled mobility application. As I stated earlier, there must, however, be a clearer delimitation between Complex Rehab Technology and Standard DME.	Thank you. We clarified that the Brief is focused on wheelchair users with complex rehab needs.

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Peer Reviewer #6	General	Clarity/Useablity: Less emphasis should be placed on consensus of those interviewed, as their opinion on "what is done in practice" is not substantiated by any evidence. Moreover, what is commonly done in practice is in some ways irrelevant. Rather, practice supported by the literature should be emphasized, i.e. the focus should be on what academia recommends or what has been published, not what the interviewees perceive is common practice. Please see the uploaded attachment for details.	We clarified what is opinion vs. what is evidence based. We thought it was relevant to describe how practice differs from published recommendations.
Peer Reviewer #7	General	Clarity/Usability: The brief lacks sufficient clarity to be used in policy development especially reimbursement or coverage policies. The brief seems to include a large amount of comments and opinions from key informants. I do not believe this carries sufficient credibility to be used to establish policies. I agree that the brief identifies the need for research regarding the service delivery process to verify the role these steps play in the outcome. However, additional clarity is needed to ensure that research is targeted in a way that will produce meaningful information.	We clarified what is opinion vs. what is evidence based. We also clarified the purpose of the Technical Brief.
Cohen, Laura	General	In general this Technical Brief is long overdue and has the potential to contribute significantly by reporting the current state of seating and mobility service delivery practice. Overall, however this document presents a rudimentary superficial review oversimplifying and generalizing very complex issues. The risk is that generalizations and inaccuracies could negatively impact Public Reviewer policy in the form of guidelines, reimbursement, coverage, prior authorization etc. As a preliminary exploratory work the Brief does begin to identify and attempt to communicate some of the contemporary issues for seating and wheeled mobility service delivery. It is my hopes that this document can be modified and enhanced prior to finalization in order to include greater detail and expand on the issues identified to develop a roadmap of priorities that can be used to set future priorities and agendas.	We added text to explain the that a Technical Brief cannot be used to develop standards or guidelines, to endorse one practice over another, or to inform policy or payment decisions, but are useful in providing direction on next steps necessary to move the topic in the direction of the development of an evidence base from which to accomplish these goals.
Ward, Scott (American Physical Therapy Association)	General	Ward, Scott (American Physical Therapy Association) appreciates the effort AHRQ is undertaking to gain a better understanding of the wheeled service delivery process. This is a very critical topic area and one worthy of this technical report and future investigations. However, we identified some areas that would benefit from further clarification, investigation and/or suggested modifications.	Thank you.

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Ward, Scott (American Physical Therapy Association)	General	While there are a multitude of issues related to wheelchair service delivery, we agree with the findings from this investigation that the vast majority of research has been focused on technology specific outcomes, rather than effectiveness of a service delivery model. Although there is a limited body of research in this area, there are a multitude of scientific questions related to service delivery models across the breadth of health care and service providers involved in the process. The identification of common measures and outcomes could significantly enhance the quality of wheelchair delivery and decrease unwarranted variations in practice.	We agree that common measures and outcomes are required to evaluate the effectiveness of the service delivery model. Our focus was on describing existing models and the evidence, to date.
Clayback, Don (National Coalition for Assistive and Rehab Technology)	General	We appreciate the attention being given to the area of the provision of wheeled mobility. It is important payers, policy makers, and others recognize the importance that wheeled mobility plays in a person's function and independence. Should a person need a complex orthotic or prosthetic device the medical necessity and need for funding is not questioned. Unfortunately the same approach is not applied to the area of wheeled mobility and the necessary related seating and positioning systems.	Thank you.
Clayback, Don (National Coalition for Assistive and Rehab Technology)	General	In examining the area of wheeled mobility it is important to recognize the different levels of technology (from basic to complex) and the various steps in the delivery process that need to be recognized and properly funded.	We clarified that our focus is on wheelchair users with complex rehab needs.
Clayback, Don (National Coalition for Assistive and Rehab Technology)	General	We agree that additional study is needed. This draft report describes a variety of practices and issues. However it is important that the final report does not leave the reader with an impression of endorsement of less than comprehensive delivery models.	We added text to explain the purpose of Technical Brief.
Clayback, Don (National Coalition for Assistive and Rehab Technology)	General	The most important section of the draft report is Section F-Summary and Implications. This identifies many of the challenges that exist today and the need for further study and implementation of needed changes.	Thank you.
Clayback, Don (National Coalition for Assistive and Rehab Technology)	General	As further evidence of the need for improvements in this area, we reference you to the initiative to create a Separate Benefit Category for Complex Rehab Technology that is currently in process. Included in this initiative are solutions to some of the problems that currently exist in the "wheelchair delivery process". To obtain additional details, please read the related Proposal Paper which can be downloaded at www.ncart.us	We are aware of this initiative and have recognized it in the Brief.

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Public Reviewer #1	General	Abstract : I am a amputee. I do wear a prothesis, in walking more than 15 ft, My foot is painful.My leg has had approx 4 bypass surgerys, therefore not strong. Having a mobility scooter would give me so much freedom in being able to get around easier for a longer distance and time. When I walk during the day to much I have pain at night in the residual limb and my leg. It does not allow me to fall asleep without trying to deal with the pain.	Thank you for your interest in this work.
Public Reviewer #2	General	Abstract: ok, raises some of the key issues	Thank you.
Cohen, Laura	General	Abstract: Provider issues also include lack of formal education/training related to evaluation and technology assessment related to wheeled mobility and seating in pre professional education (PT/OT schools).	Thank you. We added this to the list.
Ruffner, Stan	General	Abstract: Very appropriate and right on target.	Thank you.
Ward, Scott (American Physical Therapy Association)	General	Abstract: The technical brief indicates that there is a lack of high quality evidence supporting the recommended steps in the process of wheeled mobility service delivery. We recommend refraining from forthrightly stating that there is "no high quality evidence." We recognize that not having a vast collection of controlled clinical trials is fairly typical in any investigation of a clinical service delivery process. There are few service delivery models that have been the subject of clinical trials or other comprehensive "high quality" investigations. This is an identified opportunity for future research, with findings potentially being impactful and valuable to service delivery. It is true that research is needed to support the development of evidence based guidelines and to assess outcomes relative to appropriate wheeled mobility service delivery. However, the phrase "no high quality evidence" undermines the work that was conducted in the drafting of this report and its four-pronged stated purpose, especially given that there were common standards of clinical practice that were found to have evolved across all processes identified. "No high quality evidence" could be interpreted that the current processes being utilized are faulty and not of high quality. The fact that there have not been controlled clinical trials conducted represents an opportunity for future research to validate and/or streamline current practice, rather than suggesting that all current clinical practice lacks any value until such studies are conducted.	We have modified this statement to say that there is insufficient research demonstrating effectiveness of approaches to wheeled mobility service delivery. The purpose of the technical brief is to present the evidence without an assessment of quality.

Commentator & Affiliation	Section	Comment	Response
Weber, Anjali	General	Abstract: Findings: Paragraph 2 states process including equipment trials need to outline in greater detail what the process is: who is on the team (which needs an informed licensed/certified medical professional, the consumer and their family/caretakers and relevant members, and the qualified rehabilitation technology supplier. The steps include 1) initial intake of needs and goals (medical, functional, vocational, recreational) 2) review of diagnosis, prognosis, medical and functional capabilities and limitations 3) evaluation of current equipment and capabilities and shortcomings 4) equipment trial, simulation 5) recommendations, including technology, clinical services, training needs, desired outcomes 6) documentation to support funding, appeals if needed 7) equipment setup according to defined specifications, safety checks, integration issues 8) delivery, fitting, adjustments to optimize equipment use 9) outcome measurement, adjustments if desired goals not met, follow-up 10) ongoing follow-up for repair, maintenance, reassessment to ensure equipment still meets needs and goals	There is greater detail on the process in the main body of the Brief and the tables (including Appendix Table D-1).
Peer Reviewer #1	Introduction	The Introduction (Background) is well written and clearly identifies the problems that led to this report. It could expand a bit further on the breadth of the population using wheelchairs and the wide diversity of methods used to obtain wheelchairs (if the goal of this Technical Brief is to address Public Reviewer health concerns pertaining to the entire population of wheelchair users).	Thank you. We clarified that the focus is long-term wheelchair users with complex rehab needs.
Peer Reviewer #2	Introduction	In this Technical Brief, there was a very clear Background section which serves to explain why the topic of Wheelchair Service Delivery was nominated for further exploration. As noted by the authors there are many stakeholders in this area of service delivery. The brief does an excellent job of using traditional academic sources to find literature to explore the issues identified by the "professionals" in the field - providers, payers and suppliers.	Thank you.
Peer Reviewer #2	Introduction	I found it interesting that the "voice" of the end-user, consumer was not as strong as might have been expected. For example, the "grey literature" did not include any consumer-direct literature - New Mobility Magazine, Paraplegia News, etc. I also noted that none of the key informants were chosen because he/she is a person with a disability who relies on a wheeled device for mobility.	We attempted to include the consumer perspective. We are aware of the extensive consumer information. Two of our key informants represent the consumer perspective.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #3	Introduction	The Guiding questions in Section C were fine. The introduction lacked some areas of context in my opinion. I believe a discussion involving the breakdown of costs/charges/ numbers of complex vs not wc's perscribed/ service provided/etc, is pertinent to the discussion. While all payors/insurers may not provide that information, in Public Reviewerly available Medicare related reports, some information of this sort is available. Information such as this may have bearing on provider/supplier issues as well as patient satisfaction.	While we appreciate that cost is a factor, our purpose was to describe delivery systems with the goal of arriving at an appropriate match of the individual and the equipment.
Peer Reviewer #4	Introduction	The introduction does an adequate job of relating the scope of the issues to be addressed.	Thank you.
Peer Reviewer #6	Introduction	Please see the uploaded attachment. Suggestions to improve the intro are given.	These comments are listed and addressed in other sections.
Peer Reviewer #7	Introduction	As previously stated, the brief is seriously damaged by the overly broad grouping of products. In order to be more meaningful, the primary conditions leading to wheelchair use should be aligned with the different categories of products. For example, standard mobility products are more often prescribed for individuals with diabetes, heart disease, rheumatoid arthritis and osteoarthritis. Individuals requiring complex rehab are more likely to present with conditions such as spinal cord injury (paraplegia, quadriplegia), ALS, muscular dystrophy, cerebral palsy and other similar conditions.	We clarified that the focus of the Brief is on long-term wheelchair users with complex rehab needs.
Peer Reviewer #7	Introduction	Page 2 contains a comment that “inappropriate mobility devices may result in harms…” It is worth noting that even once these “harms” are identified it can be difficult to provide an appropriate device due to funding being exhausted through the delivery of the inappropriate device.	We have added this concern to the Payer Issues section
Public Reviewer #1	Background	Amputee August 2009 left leg aka	Thank you for your interest in this work.
Public Reviewer #2	Background	adequate in terms of helping describe the questions	Thank you.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Background	In general the background includes sweeping statements that are not necessarily in context or founded in the literature. I recommend citing the literature to support the claims. Suggestions follow: The statistics in paragraph 1 state that in 1994-1995 there were 88,000 (0.12%) children under 18 years and in 2005 there were 83,000 (0.20%) children under 15. At first glance it looks like the number decreases but in fact it is comparing two different groups <15 and <18 of children. Also since it is not written in parallel language the reader could easily miss the percent difference which actually indicates an increase in percentage (0.12% to .20%) but there is a smaller # reported which is confusing at first glance. This paragraph needs to be rewritten for clarity. If you are comparing the 2005 and 1994-5 dataset I suggest that you use parallel language (put percent following number in both datasets not just the latter dataset) to ease interpretation and cognitive load to reader. Also may consider a table or graph to enable quick glance at results. If you are trying to show that wheeled mobility use in the US is growing it is difficult to gather this from the way this paragraph is written.	Thank you for the suggestions. We have attempted to clarify this paragraph.
Cohen, Laura	Background	Paragraph 2 statement "Power wheelchairs are more widely available" to whom? By whom? According to whom? (cite) "Technical advances have greatly enhanced manual wheelchairs" What about power wheelchairs, seating systems, wheelchair accessories? Statement is too limiting. "Scooters or power operated vehicles (POV) are commonplace" according to who? Comment: Technical advances have progressed significantly yet DME policy has not kept pace and policy (HCPCS coding, coverage policies, payment/fee schedule policies) are not designed to account for emerging technologies and treatments to enable transfer from research and development to the clinic.	We added references and revised this paragraph.
Cohen, Laura	Background	Paragraph 1 page 2- "However, inappropriate mobility devices may result in harms" (cite and describe scope of potential harm). There is an assortment of literature that documents the harms of inappropriately applied technology and reasons for abandoned technology.	We added references to this paragraph.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Background	Paragraph 2 page 2, 1st sentence- indicates that wheeled mobility service delivery is the "process" but fails to specify that it is a "team process" comprised of qualified and licensed and/or credentialed professionals. The team process needs to be explained in greater detail and identify the team members and the collective tasks, steps to the process. Comment: The provision of Complex Rehab Technology (CRT) is done through an interdisciplinary team consisting of, at a minimum, a Physician, a Physical Therapist or Occupational Therapist, and a Rehab Technology Professional (referred to as the CRT Team). The team collectively provides clinical services and technology related services. An individual's medical and functional needs are identified by the clinical team. These needs are then matched to products and configured into custom designed systems by the Rehab Technology Professional with input from the clinical team. • The clinical CRT services are provided by a licensed/ certified Physical Therapist or Occupational Therapist. • The technology-related CRT services are provided by a certified, registered or otherwise credentialed Rehab Technology Professional. http://ncart.us/_webapp_3446556/Proposal_To_Create_Separate_Benefit_Category_for_Complex_Rehab_Technology_Released	We have added emphasis on the need for a team approach throughout the report.
Cohen, Laura	Background	Purpose - identify evidence based assessment tool to guide decision making regarding coverage for wheelchairs and accessories. While an assessment tool will assist in guiding the collection of pertinent clinical information, physical findings and technology assessment, I do not believe it is accurate to expect that an "evidence based assessment tool" will or should be used to replace the clinical judgment of a medical professional in the selection of appropriate equipment specifications or features. Furthermore an "evidence based assessment tool" will not inform "provider qualifications" OR "frequency of reassessment" whereas "clinical guidelines for best practice" could be developed to address that concern and specify the specialty knowledge, skills and tasks needed for "qualified providers"	We modified the wording of this section. The interest is in an evidence based process for wheeled mobility service delivery not specifically the patient assessment as the original language may have implied.
Cohen, Laura	Background	Purpose - The Technical brief provides background information to identify "expert opinion" regarding the process of wheelchair service delivery yet a critical stakeholder group, the complex rehab technology supplier, is conspicuously missing from the group of informants contributing to the brief.	We attempted to include representatives of all critical stakeholder groups. The report was also posted for public and peer review.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Background	Purpose - The "unique terminology" and "key terms" found in Appendix A are incomplete and not founded in approved professional terminology or definitions. It is recommended that this appendix be rewritten to include accurate professional terminology and definitions with citations where possible. The RESNA Technical Standards Board can be a resource to assist with editing/enhancing this appendix.	We contacted a RESNA representative – standard terminology is an issue they are also working on. We have not yet heard from them and therefore used other sources to enhance this section.
Ruffner, Stan	Background	Purpose - Thorough and fair in the assessment of the background on this issue	Thank you.
Ward, Scott (American Physical Therapy Association)	Background	Many of the key areas involved in wheeled mobility service delivery have been identified and discussed in the background section. Important points were highlighted that are very relevant to this issue. However, there are several broad statements for which we suggest need a reference, such as the following: ☐ "Power wheelchairs are more widely available" ☐ "Technical advances have greatly enhanced manual wheelchairs" ☐ "Scooters or power operated vehicles (POV) are commonplace" ☐ "However, inappropriate mobility devices may result in harms"	We have added references and modified this section.
Weber, Anjali	Background	Purpose - Page 2: purpose Development of an evidence-based assessment tool would help to inform the interdisciplinary team and ensure that all necessary steps are taken to guide an assessment but it will not guide decision making, which is a collaborative effort between the consumer, clinician, and supplier as well as other team members as relevant (i.e. teacher, home or school therapist, guidance or vocational rehabilitation counselor). It is most critical here that the professionals involved have the appropriate specialty skills needed for best practice.	Please see note above. We modified the wording of this section.
Peer Reviewer #1	Methods	The Methods are clearly written and at first glance they seem thorough and appropriate. Nonetheless, there are some concerning methodological problems. The target population is unclear, in so far as the wheelchair provision process described is one that most typical for persons with severe, long-term mobility limitations (i.e., full-time wheelchair users). The research questions and methodology don't specify the population beyond "individual patient" and inclusion of all wheelchair types.	We clarified that our focus is on long-term wheelchair users with complex rehab needs.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #1	Methods	The methodology used for the literature review appears to be appropriate; however, a substantive body of literature appears to have been overlooked. In specific there have been a number of studies with descriptive data on the types of wheelchair dispensed relative to particular patient characteristics (e.g., Hubbard et al, J Rehab Res 2008, Hubbard et al Arch PMR 2010) which would be informative about potential problems and variations in the service delivery process.	Thank you for the suggested references. However, with the focus on complex rehab, these references do not meet our inclusion criteria.
Peer Reviewer #1	Methods	The literature on wheelchair use/disuse, adverse outcomes (e.g., accidents), and patient satisfaction or reported problems, and how those outcomes may relate to elements of the treatment process, was reviewed to a limited extent and would warrant closer attention (e.g., Simmons et al, J Amer Geri Soc 1995; Kirby et al, Amer J Phys Med Rehabil 1994; Kirby et al, CMAJ 1996; Best et al, Arch PMR 2005).	We have reviewed the suggested references and included those that applied. References related to harms etc. have been added to the Introduction.
Peer Reviewer #1	Methods	As another example, the PVA guidelines on wheelchair provision were reviewed, but only a portion of extant VA policy on wheelchair provision appears to have been reviewed (e.g., VA Clinical Practice Guidelines on wheeled mobility devices and the CPG on power mobility devices do not seem to have been reviewed).	We added information from the Clinical Practice Guidelines.
Peer Reviewer #2	Methods	The methods used to review the existing literature were very clearly disclosed and well reasoned. The search for evidence to support the components of the service delivery process, articulated by key informants was a sound search.	Thank you.
Peer Reviewer #2	Methods	It was not as clear, however, that there were focused attempts to find answers to the very specific questions articulated in Section C. Guiding Questions. For example, was evidence found of "formal criteria" used by either payers and/or assessors during the service delivery process? Disclosure of which could have lead to an interesting question of what is the implication when the "formal criteria" of the assessors does not match (or in not consistent with) the formal criteria used by the payer -- as in the noted case of CMS policy for "in the home use only" for power mobility candidates, and an assessors criteria of meeting the mobility demands in community envirnoments.	We found “formal criteria” recommended in textbooks and articles (as noted in the Brief). As we noted, providers would ideally focus on maximizing the individual’s abilities but they must also be cognizant of the criteria of the payers.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #3	Methods	I would suggest that Fig 1 include the search terms used(or at least refer me to the appropriate Appendix). Also need to explain on the Figure what GQ 1-4 means. (I shouln't have to search for these items when I am looking at the figure). Also I am confused why there are 2 sets of guiding questions - Appendix B2and part C of the report. I was confused by the use of that term in the body of the report.	We changed the terminology referring to KI questions to 'structured discussion' questions to avoid this confusion.
Peer Reviewer #4	Methods	In order to determine the which independent variables contribute to the most desirable outcomes for Complex Rehab Technology including seated positioning systems and wheeled mobility bases the following must be considered, among other variables to be identified: • Providers (specifically Occupational Therapists and Physical Therapists) with specific training and specialization in wheeled mobility and seating vs. generalist PT or OT • Experienced and specially credentialed Complex Rehabilitation Technology supplier vs. supplier who only has achieved the RESNA ATP credential	We agree that providers and suppliers are important factors in the process.
Peer Reviewer #4	Methods	The report dismisses the CRTS credential awarded by NRRTS because the author states that there is no exam that leads to a credential. This is an unfortunate oversight. Competent Complex Rehab Technology (seating and wheeled mobility) service delivery is based on three supporting columns; experience; skill and knowledge base. The ATP only tests for general knowledge about AT and does not assure any competence or expertise specific to Complex Rehab Technology (seating and wheeled mobility) service delivery. The CRTS credential assures a minimum level (at least four years full-time employment) of experience in direct seating and wheeled mobility and currently requires 18 contact hours of continuing education annually. CRTSs are subject to a strict Code of Ethics and Standards of Practice – again specific to the provision of seating and wheeled mobility. Not including the credential offered by NRRTS in the study ignores over 750 individuals nationally who are among the best suppliers of seating and wheeled mobility services.	We added information about the CRTS credential.
Peer Reviewer #6	Methods	Please see the uploaded attachment. Specific suggestions on broadening the lit search are given.	These comments are listed and responded to below.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #7	Methods	Are the inclusion and exclusion criteria justifiable? Are the search strategies explicitly stated and logical? Are the definitions or diagnostic criteria for the outcome measures appropriate? Are the statistical methods used appropriate?	We reinforced the focus on the service delivery process to justify exclusion criteria. Any diagnosis or outcome was included if it addressed a component of the service delivery process. Other than simple proportions, no statistical methods were used.
Peer Reviewer #7	Methods	The inclusion and exclusion criteria would be more meaningful if the technology and consumers were addressed in separate categories. In addition, studies related to very specific aspects of seating and mobility should be included if they also addresses the service delivery of these items.	Because we are merely presenting a description of what evidence is available on service delivery, it made sense to use one category listing the available evidence on the service delivery process. Very specific studies of various cushions or wheels were beyond the scope of this report because our aim was to comment on the availability of evidence on the broader wheeled mobility service delivery process.
Peer Reviewer #7	Methods	Page 5 exclusion criteria 2 a, suggest revising to read "Equipment used for wheelchair sports" and then add another line to address "Standing Technology"	We are reluctant to change the wording of the exclusion criteria after they have been applied.
Cohen, Laura	Methods	While an effort was made to interview key informants a critical stakeholder group to the service delivery process was not included- rehab technology professionals (AKA) complex rehab technology suppliers. This perspective is essential to this technical brief as they are crucial team members in the wheelchair service delivery model.	We elaborated on the knowledge and perspective (and caveats) of our key informant recruitment process.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Methods	Guiding questions for key informants (Appendix Table B2) a. Payors- What are the qualifications of the decision makers that make approval/denial decisions? (i.e. true peer reviewers with comparable qualifications as the clinical/technology service providers?) Do the decision makers apply professional judgment in the review process or rely solely on decision matrices/checklists? What percent of the time do decision makers have adequate documentation to make determinations of medical appropriateness or necessity? What documentation is missing that would enable improved claims processing and review? b. Providers/Assessors- Do you have guidelines/checklists that you use? CHANGE TO- Do you have an evaluation form that you use? ADD- How do you make decisions that link your evaluation findings to the equipment features needed? How do you determine which make/model product(s) are needed for your patient based on the equipment features you identified as medically necessary and appropriate?) Describe your role and responsibilities as a team member in the service delivery process. c. Equipment Suppliers- Add- What are your responsibilities in the service delivery process? What barriers exist to you providing the most appropriate technology for your patient? Has there been a change to the quality/robustness of the technologies available to your patients? If so, why or what have you observed? Have you observed a decrease in options and features available? d. Researchers- Do the granting agencies you work with recognize research on the wheelchair service delivery process as a priority on their research agenda? Do the grant review panels view this line of clinical research to be valuable to advancing the state of knowledge in the field in order to fund these types of projects? Have you received funding for research on the wheelchair service delivery process? e. Patients/Caregivers/Advocates-Do you understand how to navigate the service delivery process? Where do you get your information on how to navigate the process? Is the process responsive to your needs? If not, what changes would you like to see? Do you know your consumer rights for wheeled mobility? Do you know where you can get assistance if you have difficulties obtaining the equipment you need? Do you have difficulty obtaining the service/repairs that you need once the wheeled mobility device has been purchased?	Questions for key informants cannot be changed after interviews have been completed. These questions served to guide the conversations and actual conversations were more reflective of the individual's specific expertise.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Methods	Describe. Data collection- key informants missing rehab technology professional, third party payer reviewer/decision maker, manufacturers Database Exclusion Criteria: P 5, #2a- statement could be misinterpreted and therefore should be rewritten or eliminated entirely. "Wheeled mobility used outside of routine activities around home and community (i.e. sports chairs, standing chairs, etc.)". Specifically these terms "sports chairs" and "standing chairs" can be misinterpreted.	We are reluctant to change the wording of the exclusion criteria after they have been applied.
Cohen, Laura	Methods	Appendix A terminology should be rewritten to be consistent with recognized standards and professional terminology. There are ultralightweight manual wheelchairs made to measure for an individual that are used in the course of daily activities. These same manual wheelchairs can sometimes be used for certain sports. It is not uncommon for third party payors and policy makers to think of these chairs as "sports chairs" when in fact they are daily use chairs. It is important not to confuse the matter. There are also standing chairs that are used in the course of daily activities to meet functional and medical needs. Were there any studies that were eliminated from this review due to this "exclusion criteria"? If not, I recommend eliminating 2a entirely.	Terminology section was updated.

Commentator & Affiliation	Section	Comment	Response
Ward, Scott (American Physical Therapy Association)	Methods	Ward, Scott (American Physical Therapy Association) realizes that the questions asked the key informants during the data collection process are in hindsight. However, we would like to highlight a key question that may have been useful to collect as data, and therefore may also be pertinent in future studies. We suggest asking the payors, "What are the qualifications of the decision makers that make approval/denial decisions for wheeled mobility services and equipment?" Given that this technical review is studying service delivery models, it is important to note that the current models and practices have the potential to be impacted and adversely affected by the payment and reimbursement environment. It is an unfortunate consequence when clinical practice is altered according to payment structure, but since this occurs within wheeled mobility service delivery models, it would be useful to capture how the driving decisions are being made and assessed by the payors. Ward, Scott (American Physical Therapy Association) has concerns regarding the exclusion criteria used for literature selection: Item 2a: The term "sports chair" can be misinterpreted. We are concerned that if this was an "exclusion criteria" that important research may have been missed. Many ultra-lightweight manual wheelchairs technically could be classified as a type of "sports chair," but are used for an individual in the course of daily activities. It is not uncommon for third party payors and policy makers to think of these chairs as "sports chairs" when in fact they are daily-use chairs. This misinterpretation could result in the exclusion of a commonly-used type of wheelchair from your investigations. ☐ Item 2c: If the goal of this technical review is to investigate service delivery models, the type of technology may not be important in all circumstances. Some important research on wheeled mobility service delivery may be excluded as a result of being too restrictive.	Questions for key informants cannot be changed after interviews have been completed. These questions served to guide the conversations and actual conversations were more reflective of the individuals specific expertise.
Peer Reviewer #1	Results	The amount of detail is inadequate and review of the studies is limited.	We elaborated on the Technical Brief process and procedures. Synthesis of evidence is beyond the scope of a Technical Brief.
Peer Reviewer #1	Results	The results presented largely represent "expert opinion" with limited use of scientific evidence, and that expert opinion does not appear to have been identified in a systematic way that reflects the breadth of wheelchair users.	We clarified what is scientific evidence vs. what is expert opinion.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #1	Results	Granted, data pertaining to the "actual" practice of wheelchair service delivery are limited, but those studies that are available have not been reviewed (e.g., Mann et al, Technol Disabil 1996) or the review neglected information on the actual wheelchair service delivery practices (e.g., Hoenig et al, J Amer Geri Soc 2005).	We reviewed the suggested references and appreciate the work of a trial of service delivery. However, our focus is on service delivery for individuals with complex rehab needs.
Peer Reviewer #1	Results	As the Introduction demonstrates, about 40% of wheelchair users are over the age of 85. Studies which are not reviewed (or reviewed in a cursory way) show that the typical wheelchair user uses the wheelchair intermittently and 30-50% of wheelchair users discontinue using the wheelchair within 3 months, and at least half the time that is because of improved health (e.g., Hoenig et al, J Amer Geri Soc 2002; Jutai et al, Arch PMR 2007; Garber et al, J Rehab Res Devel 2002). CMS regulations typically prohibit providing wheelchairs to nursing home residents (many of whom use wheelchairs), yet the wheelchair provision process is not described for that important population. Over half of persons using wheeled mobility devices pay for the devices on their own (Laplante, Hendershot, and Moss, Adv Data 1992) and wheeled mobility devices are widely available without a prescription, and the provision process for those persons is not described	We clarified that the focus of the report is on long-term wheelchair users with complex rehab needs. We recognize that there are many avenues that consumers may follow to obtain a wheeled mobility device but we have limited our scope to individuals with complex rehabilitation needs.
Peer Reviewer #1	Results	So, although many wheelchair users uses it intermittently and for a short period of time or reside in a nursing home and/or obtain their wheelchair outside the rehabilitative health care system, the description of "actual practice" and the "ideal practice" of wheeled mobility service delivery is one typical of a rehabilitation model (i.e., the patients see an expert rehabilitation therapist who crafts a seating and mobility recommendation in conjunction with a vendor), and one that is most commonly used with potentially long-term wheelchair users who have severe mobility limitations (e.g., persons with muscular dystrophy or a stroke).	Please see note above.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #1	Results	There are no objective data provided to support that the described practice is indeed the typical service delivery practice experienced by most wheelchair users. Despite the expert opinions solicited and the opinion papers & guidelines thoughtfully reviewed, there are no data presented to show that the described practice, which is clearly cumbersome and lengthy (requiring interface with a very limited supply of expert wheelchair providers, vendors, and development a detailed recommendation which goes back to the MD for "prescription" and submission to third party payers), is the actual process or even ideal process for all persons using wheelchairs.	As noted in the Brief, we based our "Practice" section on discussions with key informants – providers, consumers, payers, and suppliers.
Peer Reviewer #1	Results	All persons involved in the wheelchair service delivery process (or any complex process) have their unique biases, reflective of their personal experiences or the patient population with whom they typically interact, or even their vested interests (e.g., third party payers showing fiscal restraint, vendors staying in business), and therein lies the rub with relying on expert opinion.	We recognize the limitations of expert opinion and attempted to present a balanced perspective.
Peer Reviewer #1	Results	e. Discussion/ Conclusion: Some of the limitations in the current studies are described, but the authors appear unaware of the limitations in the expert panel, the opinion papers, and the guidelines, and the extent to which this has resulted in overlooking common practices for wheelchair provision applicable to a substantive proportion of persons using wheelchairs.	As noted above and in the text, we recognize the limitations of expert opinion and grey literature.
Peer Reviewer #2	Results	As a literature review, this technical brief is outstanding. The criteria used for the selection of the literature reviewed was sound in focusing on the process steps to be investigated when exploring the field of service delivery around wheelchairs. The display of the research findings and literature review were very clear and approachable for the reader. The brief demonstrated that available literature, while not representing "gold standard" research for evidenced-based (resource backed) practices, is consistent with key informant information. The brief is very accurate in its conclusion that there is very little evidence to support the recommended practices.	Thank you.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #4	Results	The investigators did not include information and description of problems and possible solutions presented by the CRT industry and profession and supported by American Association for Homecare, National Registry of Rehabilitation Technology Suppliers, National Coalition for Assistive and Rehab Technology and the Rehabilitation Engineering and Assistive Technology Society of North America. The comprehensive document is entitled "Proposal to Create a Separate Benefit Category for Complex Rehab Technology".	We are familiar with these sites and reviewed them again for relevant content. We have cited the "Proposal."
Peer Reviewer #4	Results	The investigators relied heavily on Assistive Technology service delivery models. Though seating and wheeled mobility CRT is loosely a subgroup of AT, the service delivery models, in many situations, is significantly different.	We removed "assistive technology" from the document except where appropriate and have clarified that some of the models are from the broader field of AT.
Peer Reviewer #6	Results	Please see the uploaded attachment. Suggestions for references to include are given, and more explanation or discussion is needed for the results in the studies listed in the paper.	Suggestions and responses are listed below.
Peer Reviewer #6	Results	Page 8 describes the prescription process as recommended by third party payers. This information is not peer reviewed or based on scientific literature, and thus should not be presented in the same light as the recommendations from scientific literature. A clear distinction should be made between what insurers suggest and what the literature supports since information from insurers may be inherently biased and is constantly in flux.	We clarified the source of the prescription process description.
Peer Reviewer #6	Results	The section related to Practice minimizes the involvement of the physician. In some service delivery models, the physician is intimately involved in the process and his or her role is far more involved than generating prescriptions. Medicare (and most other payers) also now requires that the delivery process starts with a referral from the physician.	We revised this section to include more information about the physician role.
Peer Reviewer #6	Results	Page 9, last full paragraph, contains an awkwardly worded sentence that seems to imply that home visits are rarely performed. However, this is a requirement by Medicare and many payers and routinely carried out in many academic centers.	We reworded this sentence.
Peer Reviewer #6	Results	Followup is also noted on page 10 to rarely occur; again, this is likely due to the experience of informants that is not representative of the academic community.	We acknowledged that this statement is based on the experiences of our key informant group.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #6	Results	Outcome measurements on page 10 are noted to rarely occur. This is not substantiated by a wealth of literature that supports gathering and utilizing outcome measures. There are many published articles on outcomes such as the TAWC, FEW, QUEST, Kirby's wheelchair skills tests, Massengale's PMRT, and the Smartwheel, to name just a few. These are routinely being used in many academic centers in clinical practice.	We are familiar with the published literature on outcome and skills assessment, but, again, this was not the experience of our key informant group.
Peer Reviewer #6	Results	Section b simply goes through a list of the papers that present data on delivery but do not describe the overall consensus of the data in those papers. This omitted information is perhaps the most important in the entire technical brief and should be included.	We added a paragraph in the introduction describing the purpose of a Technical Brief and that synthesis is beyond the scope of the Brief.
Peer Reviewer #6	Results	Some effort should be made to resolve seemingly contradictory information that is given in part a vs part b. For example, part a states that followup is rarely a routine practice, and yet part b states that the literature recommends follow up as being an important part of service delivery because of problems with service and repair. This is again support for the notion that what the informants claim is standard practice is not necessarily what is supported in the literature.	Part a contains recommendations for "ideal" practice based on textbooks and descriptive articles along with a description of what our informants told us happens in practice. Part b describes what was published in the literature.
Peer Reviewer #7	Results	A review of various guidelines is included. Again the terms assistive technology and wheeled mobility appear to be used indiscriminately or at least without acknowledging the difference. While there was an effort to list out steps in the service delivery process identified in various articles. The absence of a supplier as a key informant is problematic. The inclusion of this key stakeholder would allow the authors to identify current best practice today and the steps that are included. In addition, it is critical to recognize that the evaluation and assessment process requires a team approach. The brief does not identify the team, its members or the roles and responsibilities of each member.	We clarified that some of the models are from the broader area of assistive technology. Our key informant group included a representative of a supplier and manufacturer organization. We added additional information about a team approach.
Peer Reviewer #7	Results	Reference is made to recommendations from the Clinician Task Force of the Coalition to Modernize Medical Coverage of Mobility Products (CMMCMP). This recommendation is attempting to address the differences in technology and patient/client complexity. This can certainly impact the steps needed as well as the length of time spent on each step in the assessment, the need for simulation equipment, trial of recommended equipment and the number of follow up visits for fittings and adjustments. I believe this is worth some additional explanation in this section.	We agree and noted that the process can vary based on patient complexity.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #7	Results	Batavia reference indicates that early detection of the funding is important because it may limit equipment options. While you cannot change the reality of the statement in the referenced paper, it is troubling to consider that an individual may not be fully assessed merely due to limited funding. A full assessment should be the responsibility of the clinical team and then a review of funding limitations, trade-offs and potential sources of additional funding should be reviewed as a part of the evaluation with the client/consumer	We added this to the "Practice" section.
Peer Reviewer #7	Results	Findings-Third Party Payers- Reference to the CMS 2005 Decision Memo for Mobility Assistive Equipment appears to credit the Interagency Wheelchair Work Group with approving the final guidelines which limit assessment to the activities in the beneficiary's "typical home environment". I believe if you probe a little further you will find that the IWWG disagreed to the appropriateness of limiting coverage only to what is required to function within the four walls of the "typical home environment".	We attempted to distinguish the work of the Interagency group from that of the group that developed the CMS Guidelines.
Peer Reviewer #7	Results	Findings- Practice- Here the brief states that "ideally the assessor is unaware of the patient's funding source… consideration must be given to what will be reimbursed. I agree with this statement. However, additional investigation should be done to ascertain how the difference between what is covered and what is recommended is resolved.	Please see comment above regarding funding.
Peer Reviewer #7	Results	Findings-Practice- A statement is made that "Occasionally, the supplier will provide a loaner so the patient has a chance to try it" I believe this is "trial equipment" versus "loaner". Loaner equipment is what a supplier might provide to allow an individual to be mobile while waiting on a repair or waiting for their system to be delivered. In this case, the equipment is likely not to be the exact same equipment as the individual's on equipment. However, with a trial, the equipment needs to be the same as what the individual will receive in order for them to truly see whether the equipment will work for them in their typical settings. Some payers do cover "loaner" equipment while waiting for repairs.	Thank you – that was our intent and we have made this change.
Public Reviewer #2	Results	again, the findings don't seem to have much practical use for a payer.	Thank you for your interest in our work.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Results	a. Description and Context of Wheeled Mobility Service Delivery- The first sentence oversimplifies and incompletely describes the process. It is important to include ongoing services and follow up as the service delivery process extends beyond the initial assessment and delivery. I suggest modifying this to be consistent with the Proposal for separate benefit category initiative http://ncart.us. “The Process In establishing a person’s need for CRT products and services, consideration is always given to the person’s immediate and anticipated medical and functional needs. These needs include, but are not be limited to, activities of daily living (ADLs), instrumental activities of daily living (IADLs), functional mobility, positioning, pressure redistribution, and communication. CRT is used to address these needs and enable the individual to accomplish these tasks safely, timely, and as independently as possible in all environments the individual is expected to encounter. The provision of CRT consists of two interrelated components: • The clinical component of providing CRT includes the physical and functional evaluation, treatment plan, goal setting, preliminary device feature determination, trials/simulations, fittings, function related training, determination of outcomes and related follow-up. The clinical team is responsible for the prescription and supporting medical documentation. • The technology-related component of providing CRT includes, as appropriate: evaluation of the home environment; transportation assessment; technology assessment; equipment demonstration/trial/simulation; product feature matching to identified medical, physical, and functional needs; system configuration; fitting; adjustments; programming; and product related training and follow-up.” .including repairs and modifications.	We have included these elements in the “Practice” section.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Results	P5 Guidance- It is important to underscore that the "service delivery process" involves an interdisciplinary team of professionals. The statement "With the exception of adherence to the steps required to obtain reimbursement, no service delivery process is mandated". This is a very important point to underscore and deserves further elaboration. While wheelchairs are considered medical devices that require a prescription from a physician (if a third party is expected to pay) wheelchairs can be easily procured through direct purchasing (pharmacy, big box store, grocery store, on line website, manufacturer direct sales, reuse programs and community loan closets). While there are some manual and power wheelchairs that are standard durable medical equipment (commodity type products) there exists complex rehab technology products that are designed specifically for an individual comprised of components and products from multiple manufacturers. The ability to direct purchase complex rehab technologies without a prescription is similar to purchasing a custom TLSO orthotic or controlled medicine without a physician's prescription.	We added emphasis on differences in service delivery for complex rehabilitation needs and different sources of equipment throughout the Brief.
Cohen, Laura	Results	P8 paragraph 6 Third Party Payors- Please state in first sentence that there are several funding streams for obtaining payment for wheeled mobility service provision including Medicare, Medicaid, VA, Workers Compensation, Vocational Rehabilitation and Private Insurance. Each has different service delivery processes. Coverage policies differ as to the type of need that justifies coverage (i.e. medical, vocational, educational, independent living). An opening paragraph is needed here as not all payers follow Medicare policy. It should be clearly stated that not all third party payers follow the same coverage policy and Medicare is the ONLY third party payer that does not employ a true prior authorization process with peer review and individual consideration leaving uncertainty if a supplier will be paid/stay paid (in case of post payment audit) for equipment provided.	We added information about other funding sources.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Results	In reference to the statement, "The group also reviewed the evidence presented in an unpublished technology assessment on the topic.", it is important to note that the IWWG recommendations did not support limiting consideration to use of mobility devices in only the home environment even though the CMS policy did in fact ratify that limitation in the coverage decision, despite the fact that it is contrary to professional best practice. (refer to Ward, Scott (American Physical Therapy Association), AOTA, ITEM Coalition, CTF, Clayback, Don (National Coalition for Assistive and Rehab Technology), NRRTS, RESNA comments submitted during open comment period). "The IWWG recognizes that, by statute, Medicare restricts coverage to wheelchairs… 'used in the patient's home.' " Some panel members noted that extending the coverage criteria to explicitly include mobility related tasks performed outside of the home (for example, shopping for food) would facilitate greater functional independence."	We clarified that the home environment limitation was from the Medicare guideline group rather than the IWWG.
Cohen, Laura	Results	P9, 3rd paragraph, The VA model of service delivery is very different than civilian service delivery. Caution should be made in any comparisons attempted. The service delivery model differs VISN to VISN. Some VAs have dedicated Prosthetics/Orthotics staff that are responsible for ordering, configuring and essentially providing the technology related services. These costs are not factored into the cost of providing services as they are absorbed in the overhead of the VA system. Other VAs subcontract out specialized rehab technology services to local rehab technology companies.	Thank you for this clarification.
Cohen, Laura	Results	Civilian service delivery involves the essential participation of the rehab technology supplier. The RTS services are included in the purchase price of the equipment and not billable separately. Caution is needed when comparing these systems as they differ significantly. In recent years there has been a huge increase in utilization of manual and power wheelchairs. There has also been an increase in consumer direct advertising on TV, magazines, internet, and telemarketing. As a result manual and power wheelchair utilization has been under increased scrutiny. Many policy changes have been implemented in various payer programs to require an unbiased independent evaluation from a clinical professional as a means to safeguard the Public Reviewer trust and ensure consumers obtain the most appropriate and necessary technologies.	We added information about rehab technology suppliers throughout the Brief.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Results	Practice P9, 2nd paragraph,"ideally, a PT or an OT specializing in seating and mobility performs the assessment". While this is true since there are no formalized clinical guidelines this remains up to the personal judgment of the professional involved. It is not uncommon that a PT or OT does not self identify when they are unable to complete the specialty evaluation as it is beyond his/her scope of expertise and training.	We recognized that expertise and training will vary.
Cohen, Laura	Results	"ideally the assessor is unaware of the patient's funding source and is focused on maximizing the patient's functional ability; consideration must be given to what will be reimbursed". The issue is it is the clinical professional's ethical responsibility to evaluate and recommend the most appropriate equipment for the individual. The slippery slope is when professionals no longer evaluate based on what is most appropriate and limit considerations to only what is fundable. The consumer loses out in not being able to achieve their highest level of expected function, clinicians are unable to implement their plan of care and obtain the best clinical outcome because only what is fundable is available even if it is significantly different than what is most appropriate.	We included a suggestion from another reviewer to discuss equipment options and other sources of funding with the patient.
Cohen, Laura	Results	"the supplier has the expertise in the technology that can address the identified functional needs and goals" should be changed. The clinician has the expertise to identify the physical and functional needs and goals of a technology intervention and identify the equipment features needed. The supplier has the expertise for product-feature matching to the clinically identified medical, physical and functional needs. "Once the assessment is complete, a prescription from a physician and a seating and mobility evaluation with recommendations in the form of a letter of medical necessity is written	We reworded this section.
Little, Allison	Results	Page 6: Regarding the statement, "A formal followup phase was recommended by many but, perhaps because followup is not reimbursed,..." I would make it clear that the follow up is not reimbursed separately, but follow up is meant to be included in the overall pricing of the product, just as post-op visits are included in the global surgery fee for physicians. The way it is stated it, it suggests that follow up would be unusual, whereas it should be expected and is included in the reimbursement.	We added this to the text.

Commentator & Affiliation	Section	Comment	Response
Little, Allison	Results	Page 9: Regarding the statement, "Once the assessment is complete, a prescription from a physician and a seating and mobility system recommendation in the form of a letter of medical necessity is provided by the supplier to the third party payer." The letter of medical necessity often does come from the supplier, but it SHOULD come from the physician, since they are the ones attesting to the medical necessity, and at a minimum must be signed by physician.	We clarified this in the text.
Monger, Jill	Results	a. under guidance, 2nd paragraph. "this may be, in part, because... need to say also because equipment trial may be difficult due to the complex nature of the client and high customization of required features to meet clients goals.	We added this to the text.
Ruffner, Stan	Results	" A formal followup phase was recommended by many but, perhaps because followup is not reimbursed, was not included in all of the delivery systems." Outcome and followup are part of the reputable provider steps to insure appropriateness for member and feedback to therapist. Definitely agree with the patient complexity issues - perhaps criteria for each of these categories could be considered.	We noted that followup is included in the product pricing. The Clinician Task Force document includes detail for each level of complexity.

Commentator & Affiliation	Section	Comment	Response
Ward, Scott (American Physical Therapy Association)	Results	As mentioned in our Methods comments, it is important to note that the current service delivery models and practices can be impacted and adversely affected by the payment and reimbursement environment. It is an unfortunate consequence when clinical practice is altered based on payment policies. However, we have concern that the lack of funding for many of the steps in the assessment process (particularly the parts of the assessment process that were found to be inconsistent – like equipment trials and home assessments), has been understated throughout the findings of this report. It is difficult to fully evaluate the current best clinical practice for assistive device assessment and service delivery when third party payers do not consistently support these best practices. This section mentions the American Medical Association's 1996 "Guidelines for the Use of Assistive Technology: Evaluation, Referral, Prescription." While this contains very useful information for this report, APTA would suggest that it is not typical for the primary care physician to exclusively identify the need for wheelchairs and assistive technology. It is common practice for the rehabilitation professional – physical or occupational therapist or other member of the team – to identify these needs. APTA appreciates the emphasis on Medicare and the VA throughout this technical brief, however we feel that a more comprehensive approach of including other third party payers for wheeled mobility service provision would be beneficial, and should include workers' compensation, vocational rehabilitation and private insurance. All of these payors have differing service delivery processes.	We included the concern about reimbursement in the "Issues" section. We added information about a team approach to assessing patient needs. We acknowledge that there are many different payers.
Weber, Anjali	Results	Access – Asking providers about their years of experience and with particular conditions is extremely subjective. Certification and licensure provide quantifiable and objective standards by which professional can be measured.	We modified this sentence.
Weber, Anjali	Results	Provider type and qualifications: Generally accepted that PTs and OTs have the expertise to perform seating and mobility evaluations, but this is far from the current reality, as most curriculums do not provide specific training in this areas, it is not covered on their licensure exams, and most therapists have been given a few hours of lecture/hands-on training, often by a supplier. Integrating this specialty area into the curriculums and testing on the board exams is necessary to claim this expertise. RESNA has created two	We clarified the RESNA certification programs.

Commentator & Affiliation	Section	Comment	Response
		voluntary certification programs: the Assistive Technology Professional (ATP) and the Seating and Mobility Specialist (SMS). These certifications were created following accepted guidelines as published by the Institute for Credentialing Excellence (ICE), which also accredits certification programs that have met these critical standards to help ensure validity, thoroughness, and defensibility. These include creating an extensive knowledge and skills document breaking down each step of seating and mobility service provision, validating it through a practice survey sent to hundreds or thousands of practicing professionals, analyzing and validating the results to create an exam blueprint, writing items by expert committees to test areas on the blueprint, administering and exam, and analyzing data from test takers to ensure defensibility of the exam and set a passing score. The ATP certification is intended to test broad-based Assistive Technology knowledge so that all professionals involved in technology provision can speak the same language and take a holistic approach to address similar concerns with respect to accessibility, function, alleviating of medical problems, and integration of technologies to meet the consumer's needs. The SMS is a specialty certification focusing on the knowledge and skills involved with comprehensive seating, positioning and mobility service provision. This exam tests at an advanced level by using case studies, photographs and videos to analyze and synthesize findings to create and appropriate solution. Certification promotes quality assurance and consumer safeguards, identifies qualified providers, and promotes a standard of professional practice for the field. It is further strengthened by requiring adherence to a code of ethics and comprehensive standards of practice. Thousands of rehabilitation engineers, occupational therapists, physical therapists, speech and hearing pathologists, suppliers, educators and other professionals have earned certification through RESNA.	
Peer Reviewer #1	Discussion/ Conclusion	f. Clarity and Usability: The report is well structured and organized. The main points are clearly presented. Unfortunately, due to the aforementioned oversights and limitations, the conclusions cannot be relied on to broadly inform policy or practice decisions.	We elaborated on the purposes of the Technical Brief and emphasized that informing policy or practice decisions is not among those.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #2	Discussion/ Conclusion	The authors bring up the most challenging aspect to the brief -- The observation that there is little to no research to provide the evidence to base clinical practice; followed by, "Research in this area is challenging due to issues related to study design, population, environments, and equipment variations" -- not to mention the lack of formal criteria used uniformly to base purchasing decisions -- for example the use of "medically necessary" criteria; compared to importance of "consumer-centric" assessment processes.	We elaborated on ways to overcome difficulty to perform RCTs in rehab field.
Peer Reviewer #3	Discussion/ Conclusion	I think that those of us who know the literature are aware that "Research is needed to investigate and identify factors that contribute to effective wheeled mobility service delivery." I however did not find the "Next Steps" section to be of value as to how to achieve that. I am also not certain of the purpose of the issues portion of the report. Perhaps I am wrong, but it appeared to be a listing of concerns of various stakeholders without any investigative substance behind it to determine why some of these issues exist . The who/what/where/why to further look into these issues does not seem to have been pursued. I would have expected it in the report.	We attempted to address future research directions. “Issues” was the fourth guiding question. We clarified the source of these concerns
Peer Reviewer #3	Discussion/ Conclusion	Truely, the prescription of a wc is a very personal matter. But in today's world it is accomplished within a very complicated context. I think that the first steps to finding solutions to the difficulties in this field come from a more thorough understanding of the industry as a whole.	We agree that it is a complex process with many different elements involved.
Peer Reviewer #4	Discussion/ Conclusion	Independent variables that need to be considered are not clearly defined.	We added to the future research section.
Peer Reviewer #6	Discussion/ Conclusion	The focus of the paper seems to be on the lack of research in the literature while the paper overlooks important published studies. Published outcome measures (Please see the uploaded attachment) should be included in this manuscript.	We reviewed the suggested references. We included only studies focused on the service delivery process.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #6	Discussion/ Conclusion	Also, on page 17, the "physician model" under Provider issues is called into question as being the "best" model for patients. This should be explained better. Certainly, the provision of a wheelchair requires a thorough medical assessment since there are many medical problems that can be alleviated or worsened by such a device or that require medical care in conjunction with the device being provided. And in many cases this care (e.g. wound care) cannot be provided by a therapist or supplier. While some primary care physicians, for example, may not be aware of the impact of the prescription or letter they are signing, many specialty physicians, for example, view themselves as an important part of the team and would argue for such a model where the physician involved is knowledgeable about delivery. Perhaps the focus should be on the lack of trained physicians being a barrier to this process.	We added that provider knowledge may be a factor.
Peer Reviewer #7	Discussion/ Conclusion	Consumer issues should include lack of knowledge of the various resources available to them to assist in advocating for necessary wheeled mobility and seating technologies to meet the medical and functional needs.	We included this suggestion.
Peer Reviewer #7	Discussion/ Conclusion	Provider issues should include lack of education regarding the range of technologies, including features and options available on the market and how they can be applied to meet the medical and functional needs of their clients/patients.	We added that provider knowledge may be a factor.
Peer Reviewer #7	Discussion/ Conclusion	Payer and Reimbursement Issues 1) Recommend adding (j) least costly alternative recommendations by medical review staff that has not evaluated the client and may not possess sufficient knowledge of the client's needs or the various technologies.	We incorporated this suggestion.
Peer Reviewer #7	Discussion/ Conclusion	Consumer Issues 1) Third party payers may limit patient technology options through insufficient reimbursement or annual caps on DME	We incorporated this suggestion.
Peer Reviewer #7	Discussion/ Conclusion	Provider Issues 1) Add- Adequate training and education regarding wheeled mobility and seating technology assessment	We incorporated this suggestion.
Peer Reviewer #7	Discussion/ Conclusion	Need to add a section for Supplier Issues. Suppliers are a key stakeholder. The role of the supplier and the issues that impact assessment, product selection and related services must be added to the brief in order for it to meet its stated goal. Again the addition of a supplier key informant would allow the authors to identify supplier issues.	We added a supplier issues section.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #7	Discussion/ Conclusion	Research Issues 1) a. Add supplier qualifications 2) Recommend distinguishing AT, standard mobility and complex rehab mobility 3) Page 8, 3rd paragraph- last sentence- "However, conversations with key informants provided little assurance that these models are fully utilized in actual practice". I believe meaningful grouping of products would allow for a more consistence identification of the process and the steps. 4) Page 10 3rd sentence-…"there is little follow-up after the delivery". I believe this differs depending on the technology. Fittings, adjustments and modifications require follow up for complex rehab.	We have added 'supplier' qualifications to research needs discussion. We have clarified that our focus is on individuals with complex rehabilitation needs.
Public Reviewer #2	Discussion/ Conclusion	Summary/Implications: This never gets to the issue that medical directors in Medicaid have to deal with : Does someone really need a chair or not? Do they really need accessory A or B or neither and why?	We have clarified the role of the Technical Brief in the Introduction.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: The scarcity of empirical evidence in the area of seating and wheeled mobility service delivery demonstrating the effectiveness of the process and guiding decision making is not a surprising finding given the multitude of confounders (person, technology, environment, funding) contributing to the heterogeneity of a sample and complexity of study. Furthermore research agencies, grant priorities and grant review panels are hesitant to prioritize this type of research as it is not viewed as innovative, cutting edge and advancing of the field. Instead research priorities focus on the development of new emerging technologies that researchers, developers and clinicians are unable to translate and dispense in the field due to inadequate evidence and funding to support these same innovations. The mismatch between clinical practice and policy need for practical and pragmatic empirical evidence and granting agency priorities during a time of shrinking funds has contributed to this situation. Further complicating the situation is the fact that the funds for necessary seating and wheeled mobility services and equipment is discrete and separate from funds to reimburse confounding medical conditions (i.e. pressure ulcers, respiratory/pulmonary conditions, depression, falls and related complications) and personal care costs (institutionalization, personal aide services, family/caregiver assistance). Identifying and linking the cost and burden of not receiving appropriate services and equipment is complex and difficult to prove.	We incorporated some of this discussion into our summary, research, and next steps sections.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: P16, Payor and Reimbursement Issues- While payors have expressed concern about the lack of high quality empirical evidence to assist in determining the most effective and appropriate equipment for an individual the same payors have been hesitant to change their review and prior authorization processes to implement true peer review conducted by professionals with comparable credentials (PT/OT, ATP/SMS) and expertise to those required to provide the services. Implementing true peer review will enable clinicians familiar with the medical conditions and indications/contraindications for specific technologies, and recognize when a request is appropriate or includes under/overprescribed items and accessories. Subsequently the third party payor will potentially benefit from beneficiaries getting appropriate equipment to match their needs limiting equipment abandonment, secondary complications, premature replacement and repairs. Given the complexity and uniqueness of each individual situation application of a decision tree or matrix applied by a reviewer unfamiliar with the technology and individual is a dangerous situation that can result in more harm than benefit.	We added “true peer review” to our “Issues” section..
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: Arbitrary limitations such as the “only in the home” restriction has resulted in individuals obtaining less robust products designed and manufactured for “only in the home” use. Therefore it is not surprising that these products prematurely fail and/or require extensive expensive repairs (electronics, motors) when used in typical environments individuals encounter in the course of their daily lives. Also plummeting reimbursement has resulted in a race to the bottom to manufacture and provide products that will match available reimbursement despite the fact that the technology and know-how exists to build robust durable technology but restrictive funding is not available to get that same technology to the end user.	We addressed these topics in our “Issues” section.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: Medicare has adopted strictly diagnosis based coverage policies limiting coverage for certain products to specific ICD9 codes. The policies have no room for individual consideration (prior peer review and prior authorization) for those individuals with multiple comorbidities resulting in functional limitations. Therefore there exists a group of individuals unable to obtain the most appropriate prescribed equipment merely because they have not been diagnosed with a finite list of eligible ICD-9 codes. Confounding the issue is that Medicare policy is adopted by Medicaid and other third party payers resulting in a trickledown effect limiting access to people with legitimate medical need. Furthermore Medicare policy does not allow consideration of a person's future anticipated needs which are likely to develop with progressive or degenerative diseases. As a result Medicare policy only allows coverage for what a person requires on the date of the evaluation even if it means that as the condition progresses/deteriorates early replacement will be required to obtain the appropriate device. There is no room to allow professionals to plan for future needs. This is of particular concern when it comes to power mobility bases because without the proper base and electronic capability a chair cannot be modified or changed for future need, instead the entire base will need to be replaced which is an unnecessary and costly result of this limiting policy.	We addressed these topics in our "Issues" section.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: Given shrinking reimbursement, there has been an obvious decline in the quality and robustness of the products available to consumers. Also given limiting coverage and reimbursement manufacturers have been driven to develop products to meet low reimbursement and restrictive (only in the home) policy. It has become a race to the bottom in quality and cost. It is not surprising that products no longer meet the same lifecycle requirement because they are no longer designed to meet mobility needs individuals encounter in the course of their daily activities. Premature failure is more commonplace. Individuals have increasing difficulty obtaining costly repairs and often times the products are not even repairable when used in typical settings/environments. Payers often attribute premature failure on "abuse or misuse". The fact of the matter is that individuals are using their mobility devices to live their daily lives inside and outside the home. Products designed for only in the home cannot withstand typical daily use.	We addressed these topics in our "Issues" section.
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: Restrictive coverage policies for rehab professionals (PTs/OTs) arbitrarily limit the use of procedure codes that can be billed on a given visit. Therefore clinicians are forced to bring consumers back over a number of subsequent visits in order to be paid for the services provided. Given that specialty seating and mobility clinics are typically located in regional centers consumers frequently travel hours for their appointments. A CPT system that dictates the delivery model for service provision that is inconsistent with standard professional practice places unnecessary inefficiencies into the process further delaying consumers access to the technologies they require.	We addressed CPT codes in our "Issues" section.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: An antiquated HCPCS coding system that is not responsive to a range of technologies has resulted in a negative impact on access. Over the past 5 years there has been a significant increase in HCPCS code descriptors using the words “any type”. The result is dissimilar technologies are grouped together intensifying the problems with the corresponding flawed fee schedule. Furthermore level of sales required to obtain a unique HCPCS code almost guarantees that wheelchair accessories and positioning items intended for individuals with severe disabilities will remain “uncoded” causing claims processing to be more costly and the length of time to process prior authorization with non-Medicare payers to be lengthy.	We addressed HCPCS in our “Issues” section.
Cohen, Laura	Discussion/ Conclusion	Summary/Implications: Reimbursement for complex rehab technology has eroded to a crisis level due to a number of policy changes and funding cuts. These include a decade of fee schedule freezes (which alone cost the CRT industry over 29 percent when compared to what reimbursement would had been had annual CPI updates been applied) along with other significant fee reductions. The other significant reductions resulted from coding changes that produced reduced fee schedules; code descriptor changes that now state “not billable at initial issue”, “for replacement only”, or “any type”; policy changes that cre	These concerns are outside of the scope of this report. It also appears that reviewer did not have a chance to complete the last sentence of this comment.

Commentator & Affiliation	Section	Comment	Response
Cohen, Laura	Discussion/ Conclusion	Next Steps: Priority needs: 1. Train/Educate/Develop and prepare workforce a. Pre/post professional educational training for medical professionals including primary team members physical/occupational therapists. Develop and train PT/OT/Physicians b. Build capacity and professionalize the field for Rehabilitation Technology Professionals (RTPs) similar to Prosthetics/Orthotics. Develop education and training curriculums for formal academic preparation c. Pre/post professional training for referral sources including physicians, nurse practitioners, physician assistants, case managers, social workers, etc. regarding indications for referral, the process, the team, finding a qualified provider and services and outcome to expect. d. Develop educational materials on the service delivery process aimed for referral sources, consumers, caregivers "How to Navigate the System" to obtain your seating and wheeled mobility equipment. 2. Build Capacity a. Attaining a critical mass of trained medical professionals and RTPs to serve the growing need of consumers with mobility impairments needing custom mobility technologies 3. Develop Best Practice Guidelines and Standards of Practice a. Develop clinical practice standards for seating and mobility service provision b. Technology performance standards (lifecycle, durability, reliability, safety) 4. Prioritize in strategic plan and allocate funds for research and development projects a. Grant agencies should incorporate into the strategic priorities high quality research related to the wheeled mobility service delivery process including the development and validation of evidence based guidelines b. Develop reliable and valid outcome measurement tools evaluating the service delivery process, technology and user satisfaction and function c. Beyond the costs of the equipment, costs of training and maintaining equipment in the individual's environment should be considered	We added many of these concepts to the Next Steps section.
Cohen, Laura	Discussion/ Conclusion	Next Steps: Contact RESNA for the SMS job survey data results developed to represent the service delivery process for seating and wheeled mobility. It was disseminated and completed by hundreds of stakeholders who were tasked with rating the criticality and depth of knowledge and skill needed to complete each task in the course of their daily work. The results of this survey was the basis for test development for the SMS.	Thank you for the suggestion. We obtained the RESNA survey information.

Commentator & Affiliation	Section	Comment	Response
Meginness, Steve	Discussion/ Conclusion	Next Steps: Here is an example of evidence based data for applying a DME device: http://www.magicwheels.com/papers/SHOULDER%20PAIN%20STUDY,%20Finley.pdf	Although this is evidence-based data, the focus is on a specific component rather than the service delivery process.
Monger, Jill	Discussion/ Conclusion	Summary/Implications: Consumers Issues d. in many casees consumers are not allowed to use provate funds (either thier own, or donations, non profit organizations, etc.) to upgrade technology limited by their 3rd party payor (due to policy limitations, contracts, etc)	We incorporated this suggestion.
Monger, Jill	Discussion/ Conclusion	Next Steps: 1st paragraph: Intriguing concepts ... need to add inclusion in the normative model to assure basic education in PT and OT circullium to allow identification of scope of practice regarding AT.	We added this concept.
Public Reviewer #2	Discussion/ Conclusion	Next Steps: go back and at least add the questions in "Summary and Implications" to the issues that are addressed.	We have added to the “Issues” section, as noted above.
Ward, Scott (American Physical Therapy Association)	Discussion/ Conclusion	Summary/Implications: APTA appreciates the comprehensive nature of the issue lists. They are well-conceived and emphasize many of the key concerns of the differing stakeholders involved in the service delivery process. APTA strongly agrees with the following: Payer and Reimbursement Issues (c) “Medicare covers seating and mobility services and equipment necessary for performance of MRADLs in the home. It is not realistic to assume that individuals will remain confined to their homes when one of the advantages of wheeled mobility is the greater capacity and endurance for community activities.” (g) “Current Procedural Terminology (CPT) codes may not adequately reimburse providers for their services in assessing patients (especially individuals with complex medical or functional needs) and their environment (i.e., performing home, school, and/or workplace assessments), selecting the equipment (i.e., equipment trials), and delivering the equipment (i.e., fitting, training).”, Provider Issues (a) In recommending wheeled mobility equipment and services, providers must consider what they believe is right for the individual and what will get reimbursed. (b) The medical model, with the physician responsible for the prescription and the letter of medical necessity, may not be the most appropriate model for all patients or all situations. The entire Service Delivery Issues list.	Thank you. Please see updated “Issues” section

Commentator & Affiliation	Section	Comment	Response
		In regards to Provider Issues A, APTA re-emphasizes that restrictive policies affected today's clinical practice. The incentive structure is in place via the payment environment such that clinicians are increasingly forced to recommend only what is funded instead of what may be most appropriate for the individual. The consequence is that clinicians are challenged in obtaining the most appropriate equipment for his/her client and adequately implementing a plan of care which will enable the client to reach his/her highest level of function and independence. In reference to the Research Issues, APTA agrees that more research is needed to develop an evidence base for wheeled mobility service delivery. However, there are limitations inherent in rehabilitation research, involving a heterogeneous sample with individualized interventions is necessary. Evidence-based coverage policies can become unwieldy and should not be created or implemented presumptively. Professional clinical judgment, rationale, and consensus should not be undermined in instances where evidence does not exist.	
Peer Reviewer #6	Appendix	Appendix C lists strategy for literature search and states the search was done in Ovid "and other databases if available." This does not coincide with the description of the search on page 4. What does "if available" mean? Pubmed database would be a useful source of papers	Appendix C states that the listed search was performed in Ovid MEDLINE. MEDLINE is the bibliographic database. Ovid and Pubmed are ways to access this database, we selected Ovid due to the superior search strategy documentation. Content of the databases is the same. The Methods section lists the other bibliographic databases that were searched.
Peer Reviewer #6	Appendix	Additional search terms that may be useful and would expand paper search are Insurance; Medicare; Public Reviewer policy	Given that our search was quite broad, we likely captured these particular references. This suggestion would have narrowed the search.
Peer Reviewer #7	Appendix	Appendix A: The definitions for Standard, Standard Hemi, Growth and Lightweight/ultralight are not consistent with industry definitions, do not align with HCPCS coding definitions and do not reflect the actual usage of this technology. I do not suggest using the HCPCS codes definitions as they have not kept up with changes in technology. However, it is important to revise the definitions in Appendix A.	Terminology section was updated.

Commentator & Affiliation	Section	Comment	Response
Peer Reviewer #7	Appendix	Power Wheelchair definition indicates that joystick control is most common and includes power seating system. This is not a true statement. Power seating (elevation, tilt, recline etc) is added to the power wheelchair base when an individual qualifies. Additionally, alternative drive controls (i.e. head controls, switches) are exclusively available on complex rehab bases.	Terminology section was updated.
Cohen, Laura	Appendix	Appendix A definitions are narrow, incomplete and ill defined. Better descriptions of the types of technologies exist and should be referenced with citations. The functionality that differentiates the technology is imperative to include in the descriptions as it is not the size or weight of the device but the ability to configure and individualize the technology that supports indications/contraindications for specific levels of technologies. This section needs significant rewrite for accuracy.	Terminology section was updated.
Cohen, Laura	Appendix	Appendix B Missing rehab technology supplier and manufacturer as critical stakeholders Appendix D2 (PD-9 or 43) Outcome measurement instrument list is incomplete and lacking. Below are additional measures frequently considered by researchers conducting AT research 1. Recognized Activity and Participation measures include: a. Late-Life Function and Disability Instrument (LLFDI) b. LIFE-H c. Impact on Participation and Autonomy (IPA) d. Craig Handicap Assessment and Reporting Technique (CHART) e. Life Space Questionnaire (LSQ) f. Community Integration Questionnaire (CIQ) g. Community Perceived Participation Receptivity Survey (CPPRS) h. Function Everyday with a Wheelchair (FEW) 2. Recognized Environmental Measures a. Craig Hospital Inventory of Environmental Factors (CHIEF) b. Environmental Analysis of Mobility Questionnaire (EAMQ) c. Home and Community Environment Instrument (HACE) 3. Recognized Caregiver Burden Measures a. Caregiver Strain Index b. Caregiver Burden c. Burden Interview d. Screen for Caregiver Burden 4. Recognized AT Satisfaction Measures a. Assistive Technology Device Predisposition Assessment b. Psychosocial Impact of Assistive Devices Scale (PIADS) c. Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST)	One of our Key Informants is a representative from a supplier/manufacturer organization. The instruments listed at the end of Appendix D2 are footnotes to the table and were not meant to be a complete list of outcome measurement instruments.

Commentator & Affiliation	Section	Comment	Response
Meginness, Steve	Appendix	Appendix A. Terminology and Abbreviations Terminology Manual Wheelchair Push- Assist – Bridge between manual and power wheelchair; may be battery operated device attached to rear wheels or manually shiftable gears (similar to a bicycle); also referred to as PAPAW – push rim activated power assist wheelchair. COMMENTS: The GEAR REDUCTION DRIVE WHEEL (HCPCS E2227) is substantially different from a PAPAW (E0986) and is even given a different HCPCS code. Under ABBREVIATIONS should add: GRDW - for Gear Reduction Drive Wheel	Terminology section was updated.
Ruffner, Stan	Appendix	excellent starting point for providers, payors, and members	Thank you.

Commentator & Affiliation	Section	Comment	Response
Ward, Scott (American Physical Therapy Association)	Appendix	Ward, Scott (American Physical Therapy Association) is concerned with the definitions and terminology used in Appendix A, and suggests that significant revisions may be necessary. There are better descriptions of the types of technologies referenced in this appendix. It is important that the functionality that differentiates the technology be included in the descriptions, as it is not the size or weight of the device but the ability to configure and individualize the technology that supports indications/contraindications for specific levels of technologies. Below are additional measures frequently utilized by researchers of assistive technology, which can be considered with those already included: 1. Recognized Activity and Participation measures include: a. Late-Life Function and Disability Instrument (LLFDI) b. LIFE-H c. Impact on Participation and Autonomy (IPA) d. Craig Handicap Assessment and Reporting Technique (CHART) e. Life Space Questionnaire (LSQ) f. Community Integration Questionnaire (CIQ) g. Community Perceived Participation Receptivity Survey (CPPRS) h. Function Everyday with a Wheelchair (FEW) 2. Recognized Environmental Measures a. Craig Hospital Inventory of Environmental Factors (CHIEF) b. Environmental Analysis of Mobility Questionnaire (EAMQ) c. Home and Community Environment Instrument (HACE) 3. Recognized Caregiver Burden Measures a. Caregiver Strain Index b. Caregiver Burden c. Burden Interview d. Screen for Caregiver Burden 4. Recognized Assistive Technology Satisfaction Measures a. Assistive Technology Device Predisposition Assessment b. Psychosocial Impact of Assistive Devices Scale (PIADS) c. Quebec User Evaluation	Terminology section was updated. The instruments listed at the end of Appendix D2 are footnotes to the table and were not meant to be a complete list of outcome measurement instruments.