Specialized Seating and Equipment Assessment Evidence Table

*(*Quality of Evidence based on McMaster Guidelines for Critical Review of Qualitative Studies or the Downs and Black Assessment Checklist)*

Study	Purpose/Design/ Subjects	Quality/ Level of Evidence *	Study Variables/ Outcome Measures	Results	Authors Conclusions	Limitations	Additional Information/ Clinical Relevance
Kennedy et al., 2003[1] "The Effect of a Specialist Assessment Clinic on the Skin Management of Individuals with Spinal Cord Injury"	**Purpose:** To compare skin management outcomes, based on timing of a specialized seating assessment and intervention **Design:** Observational Longitudinal Outcome Study using Retrospective Data **Subjects:** 50 rehab inpatient wheelchair users s/p SCI separated into 3 groups based on timing of Needs Assessment Checklist (NAC) and education. Group 1 Seating Assessment before NAC. Group 2 Seating Assessment between first and second NAC. Group 3 Only in-patient rehabilitation.	Low, 2c	To be Achieved Skin (tba) Management %* based on the NAC *represents the degree of skin integrity management that is yet to be attained, lower value is more desirable	Group 1 less skin management tba at NAC 1 compared to group 3 by 19.8% ($p<.05$). Group 1 less skin management tba at NAC 2 compared to group 3 by 13.5% ($p<.01$). Group 2 less skin management tba at NAC 2 compared to group 3 by 9.4%, treatment effect @.6 Group 1 less skin management tba at NAC 1 compared to Group 2 by 10.2%, treatment effect @.5	A specialized seating assessment and education is an effective proactive tool necessary to promote improved independence with skin management for patients after spinal cord injury and is best delivered early in rehabilitation.	Small Sample Size Adult population limits generalizability to children Poorly described intervention Lacks descriptive data of each group therefore, unknown differences between groups possible Inappropriate statistical tool	Specialized education and training important even among patients receiving therapy who are familiar with seating and positioning.

Huhn et al., 2007[2] "The Clinical Decision-Making Process of Prescribing Power Mobility for a Child with Cerebral Palsy"	**Purpose:** To Describe clinical decision making for pediatric power mobility. **Design:** Single Case Description: Compare Rear Wheeled Drive (RWD) to Mid-Wheel drive (MWD) **Subject**: 9 year old child with multiple disabilities	Low, 5	Use of power wheelchair head array drive control 2 Week Training Time Period # of collisions during Power Wheelchair Task Negotiating; 1. through a doorway 2. school hallway 3. around cones	1. After two years drove RWD with verbal cues and collisions 2 Independence one month transition to MWD after 2x week training 3.Reduced collisions with MWD 4.One year after MWD no collisions with all three tasks 5.Child one obstacle course race in Special Olympics one year after MWD.	Clinicians should provide multiple sessions to assess power wheelchair readiness Length of training may be related to eventual independence Clinical expertise and patient/family goals drive equipment training/prescription Wheelchair readiness, type of wheelchair and motivation are important factors to consider in assessment.	Lacked standardized outcome measure Case study limits generalizability	Need for open space, equipment to try and increased/time training Provides and example of individualized assessment and treatment for a child with complex needs Children with complex needs can become independent with proximity switches
Hoenig et al., 2005[3] "A Clinical Trial of Rehabilitation Expert Clinician versus Usual Care for Providing Manual Wheelchairs"	**Purpose:** To measure the effect of an individualized wheelchair assessment and intervention delivered by a therapist trained in seating and mobility versus standard care delivered by a licensed therapist. **Design:** Quasi-experimental study between subject repeated measure	Low, 4	Patient Report Survey: Wheelchair use Wheelchair comfort and confidence Shoulder pain Home Modifications	**Wheelchair Prescription:** Intervention group: 45.3% standard 28.3% light weight 20.8% power/scooter 96.2% cushions Control group: 71% standard 12.9% light weight 3.2% Power/scooter 64.6% cushions Expert group reported more wheelchair use and home	Specialized assessment and intervention increases daily patient wheelchair use and home modifications more than usual care. Wheelchair use was significantly related to shoulder pain and home modifications. Higher cost in the intervention group due to specialized cushions and	High Attrition Convenience sample, not truly randomized Not blinded, Primary investigator completed all surveys Significant differences between groups. 94% males	Power wheelchairs more likely from specialized therapist Specialized therapists may educate more on home modifications

	design **Subjects:** 84 in-patients at DVAMC **Two Groups:** 1. Wheelchair provision provided by staff therapists 2. Wheelchair assessment and provision by therapist specialized in seed mobility			modifications Most common home modifications were installation of ramps, bars and use of adapted toilet or bath seat. Increased wheelchair use was related to shoulder pain and home modifications.	non-standard wheelchair prescriptions	Possible Hawthorne Effect Specialized therapist was not ATP certified Intervention group received 35.1 more minutes of treatment. Intervention dosage not well controlled.	
Wright et al., 2010[4] "Establishing Best Practice in Seating Assessment for Children with Physical Disabilities Using Qualitative Methodologies"	**Purpose:** To describe accepted and employed elements of a pediatric seating assessment by physical and occupational therapists working in specialized seating clinics the UK and Ireland. **Design:** Non-experimental Qualitative Study: Two arms: 1. Observational 2. Delphi **Subjects:** 3 PSEC including 13 therapists	High, 5	Observational: Frequency and percentage of observations from an 83-item checklist devised from best practice seating assessment literature via in person and video recordings Delphi: Consensus and general rating of response (positive, negative or neutral) for 21 sub-themes identified in round 1 by participants.	Observational Arm: Only two seating assessment items performed in all six observed evaluations: assessment of current seating device and equipment prescription No obvious assessment of behavior, social development, emotional development, funding, reflexes, skin inspection for areas of redness or sores, measurements of flexed elbow height, transfers and simulation 16.7% of therapists evaluated need for lateral trunk support, discussed plans for subsequent delivery/training/education or preformed all of the necessary musculoskeletal measurements and observations included in a mat evaluation Delphi Arm: Consensus was reached on the importance, desirability and feasibility	Therapists appear to understand the foundational aspects necessary for an optimal pediatric seating assessment. Omitted elements may have been due to the intuitive clinical reasoning without explicit verbalized statements. A multi-disciplinary assessment including a physical or occupational therapist is both realistic and ideal based Inadequate training or accreditation may result in deficient seating use and prescription. Therapists value a	No US centers in study Relatively small study High center drop out rate Therapist experience varied, ½ were not true specialists in their field	The lack of consistent performance of mat assessment and anthropometric measurements during the observational study is a concern. Need more than one appointment to address all necessary components of best practice seating assessment

				for the all of the sub-themes within Assessment Process, Observations/Physical Assessment, and Broader Issues. Consensus was not reached on importance of standard assessment or feasibility of review, standard vocabulary, training and legislative knowledge. Evaluation times 20-60 minutes	intuitive, individualized approach		
Isaacson, 2011[5] "Best Practices by Occupational and Physical Therapists Performing Seating and Mobility Evaluations"	**Purpose:** To describe best practice for seating and mobility evaluations based on the perceptions of PT/OT specialists **Design:** Non-experimental Qualitative Descriptive Study Delphi (Consensus) **Subjects:** 15 seating and mobility experts	Low, 5	Themes based on qualitative text Demographic information of subjects. Delphi Round 1: Open ended questions Round 2: Eight Item Questionnaire (Likert scale 1-5)	Respondents experience ranged 10-33.5 years Round 1: 15/15 responded Themes: Experience, knowledge, sensitivity to consumers needs Round 2: 14/15 responded Additional Themes: specific skills needed for assessment, strategies to gain necessary skills/ knowledge, barriers • Identified Necessary skills: Mat assessment (12/14 responded Very Important) • Simulate desired seated position with equipment trial or simulator. (13/14 Important or Very Important) • Pressure mapping • Movement assessment • Environmental assessment • Patient interview	Best practice themes include: Clinician experience, hands-on techniques, skills, technology, resources, self-directed learning, follow-up and consumer relations. Barriers to best practice: time restraints, limited funding, unavailable equipment for trials, limited ability to complete environmental assessment.	Lacked statistical data analysis, specific techniques used to identify themes and description of collected responses for either round Only reported frequency of responses for two 2nd round results.	
Guerette et al., 2005[6] "Pediatric	**Purpose:** To Describe current practice and providers of pediatric power wheelchair	Moderate, 5	Survey pertaining services provided to children ages 2-6 years of age	Demographics: 140 Total respondents;	Lack of access to extended loaner equipment from manufacturers negatively	No triangulation with observations, only provider reports	One of the few studies looking ONLY at young children ages 2-6.

Powered Wheelchairs: Results of a National Survey of Providers"	assessment, prescription, reasons children do not receive recommended power mobility, funding and recommended alternatives to power mobility. **Design:** Non-experimental, Descriptive Qualitative Study **Subjects:** 380 mailed surveys to pediatric power mobility suppliers and clinicians from 46 states		in the last 2 years: Descriptive Demographics of respondents Frequency of 16 components of a wheelchair evaluation (including "other') based on provider type Frequency of recommended activities if power wheelchair was not recommended based on provider type Funding Sources	54% clinicians, 46% suppliers 52% urban, 35% Suburban, 13% rural 37% hospital setting, 18% outpatient rehab, 18% school, 9% home health, 18% other Evaluation Findings: Suppliers evaluate more children than clinicians (10.5 vs 5.6 per year) Clinicians recommend power more often (79% vs 68%) Average youngest age of child recommended @ 36 months regardless of provider type. >40% providers lack access to extended loaners and 62% of those report negative effect on equipment recommendations 41% report low cognition as main reason for not recommending power mobility No significant differences in frequency of wheelchair activities or alternative recommendations between suppliers and clinicians Children did not receive recommend power mobility due to: Lack: 1. Funding 39% 2. Family support 22% 3. Transportation 18%	impacts child ability to progress to independent mobility. Providers must consider funding, transportation and family support when evaluating children for power mobility. Providers must collaborate with families and educate families on the positive impact on child development. Developed a dynamic model of current practice divided into: Intake, Preliminary Clinical Assessment, and Advanced Clinical Assessment. Assessment is informed by parental input, home environment, child's temperament. The assessment is used to recommend a power wheelchair or clinical/non-clinical alternatives. Providers should include a cognitive assessment prior to recommending	Only addressed power mobility limits generalizability to other equipment Unknown expertise/experience of respondents Small number or children assessed	Easy to read tables. Strong data analysis and appropriate descriptive statistics. Model of practice created for future studies Respondents were all from the USA.

				Funding Source 50% Medicaid or CHIP, 20% Private Insurance Alternatives to Power: Most Frequent: *Clinical:* extended practice, play activities to improve input control, developmental activities, re-eval in 6-12 months *Non-Clinical:* home modifications, information on alternative funding Most frequent assessment activities: Parent input, posture, home environment observations, input device, observe child behavior, observe play in wheelchair, input from teachers, medical record review, community WC skills.	power mobility.		
Lukersmith, Radbron, Hopman, 2013[7] "Development of CPGs for the Prescription of a Seated Wheelchair or Mobility Scooter for People with TBI or SCI" Full CPG	Purpose: To develop a CPG for seated mobility/scooter for individuals with SCI/TBI Design: Systematic review based on 44 clinical question. Studies Utilized: Clinical Practice Guideline Wheelchair for TBI and SCI	Moderate , 5	Levels of Recommendations ranked highest to lowest based on quality of evidence: A, B, B^{Q}, C, C^{Q}, D, Consensus, Principle or Requirement	Created 76 Recommendations within 44 clinical questions. Made Ten recommendations under Assessment/Review 8 recommendations based on consensus Referral to specialist B^{Q}* Assess factors related to non-use B^{Q}* *Grade of Recommendation: B^{Q}= based on quantitative and high quality qualitative studies	Section 6.2,: Recommendation 14: Referral of a patient with complex postural needs to a specialist (interdisciplinary) seating team with expertise in seating either in person or remote/video conferencing. Recommendation 16: The factors identified in research related to non-use of provided AT should be considered during WC prescription.	Limited generalizability to pediatric. Mostly qualitative data studies and expert opinion.	Comprehensive critique of available evidence. Specific to SCI and TBI but many children with have complex seating needs.

Long and Perry, 2008[8] "Pediatric Physical Therapist's Perception of Their Training in AT"	**Purpose:** To determine pediatric physical therapists perception of adequate training and confidence in assistive technology provision. **Design:** Non-experimental, Descriptive Qualitative Study: Survey **Subjects:** Survey sent to 1000 Pediatric Physical Therapists	High, 5	Self-Report Survey of Pediatric PTs: Respondent Demographics Rating of AT training/services Confidence in AT Service Provision Desired Additional AT Training Preferred Training Methods Challenges to Increased Training	380 respondents (38% response rate) **Description of respondents:** **Experience:** 62% more than 11 years **Setting:** 25% early intervention, 5% inpatient, 11% hospital outpatient, 11% home care, 14% private practice, 38% school system **% of job responsibilities with AT:** 0-10%: 36% of respondents 11-40%: 49% of respondents >41% 15% of respondents **Survey Results:** 33-59% reported lack of AT training in all described categories 62% lacked confidence to evaluate AT needs 65% lacked confidence to provide training in AT 87% lacked confidence in high tech devices including power wheelchairs Respondents preferred training modality: One on One and group instruction average 2.8/5 effective Respondents reported need for training in all categories tested. Primary barriers to training: funding, lack of high quality training, location, cost, timing, and too few courses.	Pediatric PTs are the optimal providers to assess and prescribe AT for children. Pediatric PTs need more training and knowledge of AT assessment and intervention. DPT curriculum can include AT clinical reasoning within currently established courses. Pediatric PTs recognize the need for AT but lack the training and confidence to provide these services. Pediatric PTs desire training in mobility, seating, positioning, clinical decision-making, funding and assessment.	Low response rate Unknown pediatric experience Only surveyed APTA members	Supports the need for a specialized clinic for equipment assessment. Clinic can also provide in-services for area PTs and hands on training DPT students. Well-designed study with use of appropriate statistics.

Trefler and Taylor, 1991[9] "Prescription and Positioning: Evaluating the Physically Disabled Individual for Wheelchair Seating"	**Purpose:** To describe the necessary components of a seated mobility evaluation **Design:** Expert Opinion Summary Subjects: None	Low, 5	N/A	Thorough evaluation, use of biomechanical seating principles, seating simulation and match equipment to needs.	Expert Opinion only Date of publication prior to emphasis on EBP.	Provides a framework for evaluation and supports need for equipment trial.
O'Rourke, 2010[10] **"Q-and-A with Barbara Crume, ATP: An Experienced Seating and Mobility Clinic Manager Discusses her Process"**	**Purpose:** To describe a North Carolina Seating Clinic Non-experimental, Newsletter Interview **Subject:** Barbara Crume, PT ATP	Low, 5		Describes set up of a seating clinic, breaking assessment into multiple visits and coordination with vendors.	Expert Opinion	Clinically relevant, provided expert contact

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