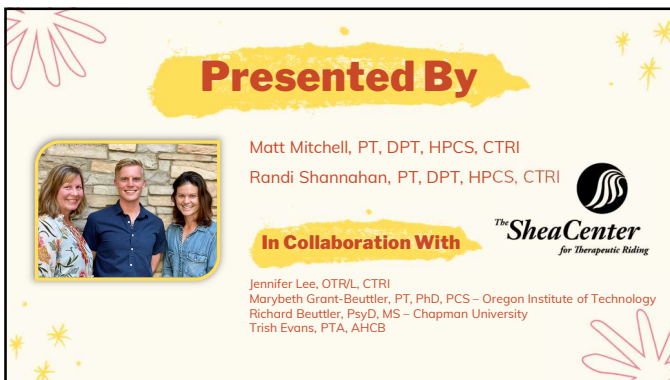




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3

LEARNING OBJECTIVES

Objective #1
Become familiar with the Pediatric Evaluation of Disability Inventory – Computer Adaptive Test (PEDI-CAT)



Objective #2
Discuss past and current findings of using PEDI-CAT as an outcome measure for children receiving PT, OT, SLP utilizing hippotherapy (HPOT)

Objective #3
Learn how to successfully integrate PEDI-CAT into practice

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OUTLINE

Today's Discussion

- #1 Standardized Assessments
- #2 ICF Review
- #3 PEDI-CAT Research
- #4 Practical Applications




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#1 Standardized Assessments



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A History

Therapy at
The Shea Center




- ❑ 153 weekly therapy clients
- ❑ 73 PT / 63 OT / 17 SLP
- ❑ Track progress, set goals, promote shared decision making, adjust plan of care
- ❑ 2022 Published research¹



¹Susan Conroy, Trish Evans, Dana Butler-Moburg, Richard Beuttler, Janelle Robinson, Matt Huebert, Erin O Mahony & Marybeth Grant-Beuttler (2022) Clinical application and feasibility of utilizing the PEDI-CAT to assess activity and participation among children receiving physical therapy incorporating hippotherapy, *Physiotherapy Theory and Practice*, 39(11), 2300-2313, DOI: [10.1080/20701328.2022.2072245](https://doi.org/10.1080/20701328.2022.2072245)

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Types of Outcome Measures




- ❑ Self-Report²
- ❑ Performance-Based
- ❑ **Observer-Reported**
- ❑ Clinician-Reported

Pediatric Evaluation of Disability
Computer Adaptive Test (PEDI-CAT)

²Coombes, L., Bristowe, K., Ellis-Smith, C. et al. Enhancing validity, reliability and participation in self-reported health outcome measurement for children and young people: a systematic review of recall period, response scale format, and administration modality. *Qual Life Res* 30, 1893–1897 (2021). <https://doi.org/10.1007/s11136-021-02814-4>

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Why the PEDI-CAT?



PEDI³
(Pen & Paper)


➔

PEDI-CAT⁴
(iPad/Email)

³Haley S, New England Medical Center Hospital PEDI Research Group. Pediatric Evaluation of Disability Inventory (PEDI). Development Standardization and Administration Manual. Version 1.0. PEDI Research Group; 1997.

⁴Haley S, Coster W, Dumais H, Frangola-Parkham M, Moore B 2012. PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

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Age⁴

Diagnoses⁴

Validity⁵

Reliability⁶

Disciplines

4 Functional Domains

Parent or Therapist


12-minute Survey

11 Different Languages

PEDI-CAT
Populations & Psychometrics

⁴ Haley S, Coster W, Dumas H, Frangola-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.
⁵ Dumas H, Frangola-Pinkham M, Rosen L, Ni P 2021 A content validity evaluation of the PEDI-CAT speedy mobility domain. *Physiotherapy Theory and Practice* 37(4): 517-526.
⁶ Dumas H, Frangola-Pinkham M, Haley S, Ni P, Coster W, Kramer J, Kao Y, Moed R, Ludlow L 2012 Computer adaptive test performance in children with and without disabilities: Prospective field study of the PEDI-CAT. *Disability and Rehabilitation* 34(5): 393-403.

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Pediatric Evaluation of Disability Inventory Computer Adaptive Test

SUMMARY⁴

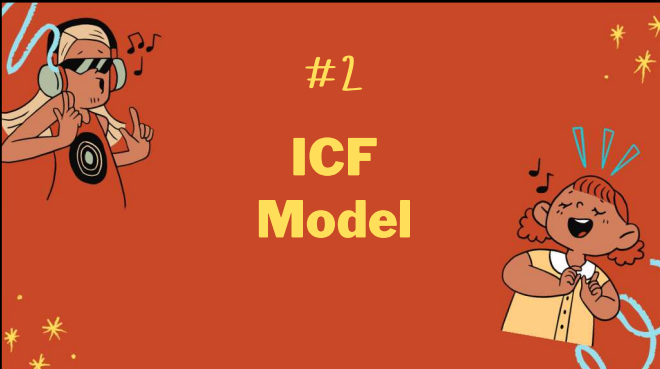
1	2	3	4	5	6	7	8	9	10	11	12	13
Domain	Score	Date	Scaled score	SE	T-Score ⁵	Percentile ⁶	FI	# Items	Proxy	Device ⁷	Whisper ⁸	Type ⁹
Daily Activities (ASD)	53	05/27/2022	1.01	1.01	50	51	1.23	6	Parent	0	0	1
Mobility	66	05/27/2022	0.88	0.88	57	78	-1.21	13	Parent	0	0	1
Social/Cognitive (ASD)	51	05/27/2022	2.05	2.05	26	2	-2.21	15	Parent	0	0	1
Responsibility (ASD)	23	05/27/2022	6.52	6.52	13	<1	0.67	12	Parent	0	0	1

⁴Haley S, Coster W, Dumas H, Frangola-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

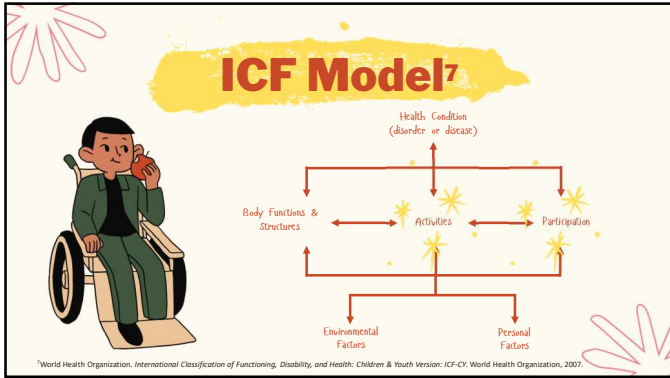
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#1

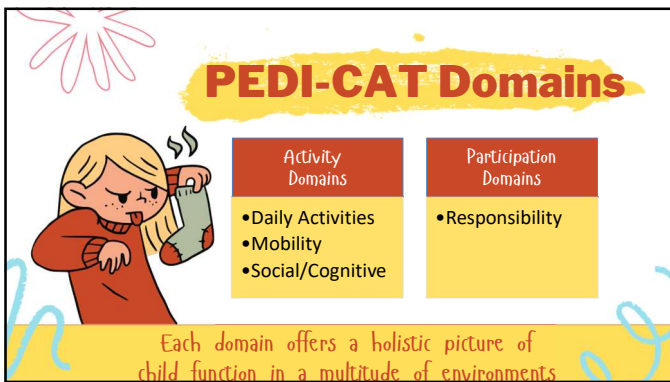
ICF Model



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17



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Daily Activities Items⁴

Home Tasks	Cuts with scissors to open hard plastic packaging		<p>Response scale:</p> <ul style="list-style-type: none"> <input type="radio"/> Unable <input type="radio"/> Hard <input type="radio"/> A little hard <input type="radio"/> Easy <input type="radio"/> I don't know
Keeping Clean	Rubs hands together to clean		
Eating & Mealtime	Finger feeds small or bite-size pieces of food		
Getting Dressed	Fastens a necklace or chain		

⁴Haley S, Coster W, Dumas H, Frangala-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

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Mobility Items ⁴

Basic Movement & Transfers	Gets onto hands and knees		<p>Response scale:</p> <ul style="list-style-type: none"> <input type="radio"/> Unable <input type="radio"/> Hard <input type="radio"/> A little hard <input type="radio"/> Easy <input type="radio"/> I don't know
Standing & Walking	Stands on tiptoes to reach for something		
Steps & Inclines	Hikes up hill 2-3 miles/3-5 kilometers		
Running & Playing	Kicks a rolling ball while standing		

*Haley S, Coster W, Dumas H, Frangala-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

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Social / Cognitive Items ⁴

Interaction	Asks one or more peers to play using words or gestures	<p>Response scale:</p> <ul style="list-style-type: none"> <input type="radio"/> Unable <input type="radio"/> Hard <input type="radio"/> A little hard <input type="radio"/> Easy <input type="radio"/> I don't know
Interaction	Takes turns sharing a favorite toy with peers	
Communication	Uses words, gestures or signs to ask for something	
Communication	Uses several words or signs together such as "go home now" and "daddy go"	
Everyday Cognition	Understands signs in the community such as Restrooms or EXIT	
Everyday Cognition	Counts out the correct amount of bills and/or coins to pay for an item costing \$20-\$40	
Self-Management	Accepts advice or feedback from a teacher, coach, or boss without losing temper	
Self-Management	Keeps unsafe objects and household materials out of mouth	

*Haley S, Coster W, Dumas H, Frangala-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

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Responsibility Items ⁴

Organization & Planning	Getting ready in the morning on time	Getting up, Getting dressed, Grooming and hygiene activities; Eating breakfast; Completing on time	<p>Child's level of responsibility:</p> <ul style="list-style-type: none"> <input type="radio"/> Adult has full <input type="radio"/> Adult has most <input type="radio"/> Adult and child share responsibility about equally <input type="radio"/> Child has most <input type="radio"/> Child has full
Organization & Planning	Keeping track of time throughout the day	Arriving on time to scheduled activities or appointments; Coming back home at planned time; Ending an activity on time to stay on schedule	
Taking Care of Daily Needs	Managing food needs for the entire week	Obtaining food at grocery stores or restaurants; Fixing meals as needed	
Taking Care of Daily Needs	Using safe food handling practices in the kitchen	Washing hands and cleaning surfaces, dishes, and utensils thoroughly; Disposing of expired or rotten foods	
Health Management	Taking care of minor health needs	Caring for minor cuts and burns; Taking over the counter medication for fever, cold, and flu when appropriate	
Staying Safe	Traveling safely within the community	Identifying and following a safe route; Using available methods of transportation (e.g. walking, driving, public transportation)	
Staying Safe	Eating safely without choking or burning self	Chewing food adequately; Taking appropriate-sized bites; Testing temperature; Pacing self	

*Haley S, Coster W, Dumas H, Frangala-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

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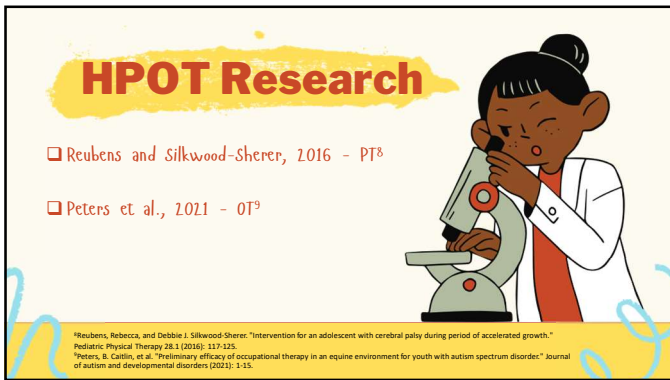


#3

PEDI-CAT Research


The graphic features a red background with two cartoon children. On the left, a girl in a yellow dress holds a bouquet of white flowers. On the right, a boy in a white shirt and brown shorts holds a red rose. The number '#3' is at the top center, and the title 'PEDI-CAT Research' is in large yellow letters.

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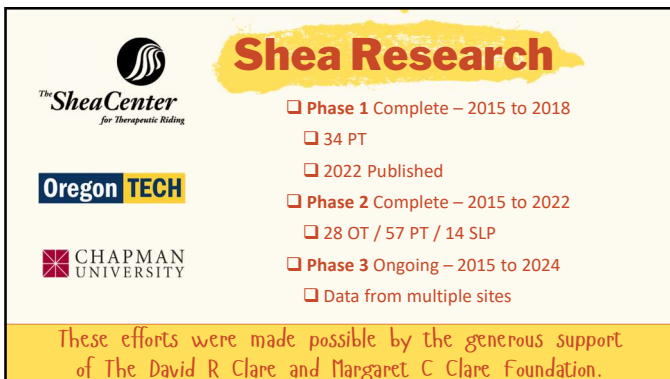
HPOT Research


- Reubens and Silkwood-Sherer, 2016 - PT⁸
- Peters et al., 2021 - OT⁹





⁸Reubens, Rebecca, and Debbie J. Silkwood-Sherer. "Intervention for an adolescent with cerebral palsy during period of accelerated growth." *Pediatric Physical Therapy* 28.1 (2016): 117-125.
⁹Peters, B. Caitlin, et al. "Preliminary efficacy of occupational therapy in an equine environment for youth with autism spectrum disorder." *Journal of autism and developmental disorders* (2023): 1-15.

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The Shea Center
for Therapeutic Riding

Shea Research

- Phase 1 Complete – 2015 to 2018
 - 34 PT
 - 2022 Published
- Phase 2 Complete – 2015 to 2022
 - 28 OT / 57 PT / 14 SLP
- Phase 3 Ongoing – 2015 to 2024
 - Data from multiple sites

These efforts were made possible by the generous support of The David R. Clare and Margaret C. Clare Foundation.

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Methods

Participants

- New clients with any medical diagnosis who participated in weekly PT/OT/SLP using HPOT
- Age 1.5 – 20
- Greater than 65% attendance rate
- Participated in treatments for at least 6 months

Procedure

- Pre-post study design: PEDI-CAT administered at initial eval (T1) and then again after 6 months of treatment (T2)
- Participated in weekly therapy sessions utilizing HPOT

Data Analysis

- Linear Mixed Effects Model¹⁰
 - Initial age
 - Change in scaled scores from T1 – T2
 - Difference in scores between therapies

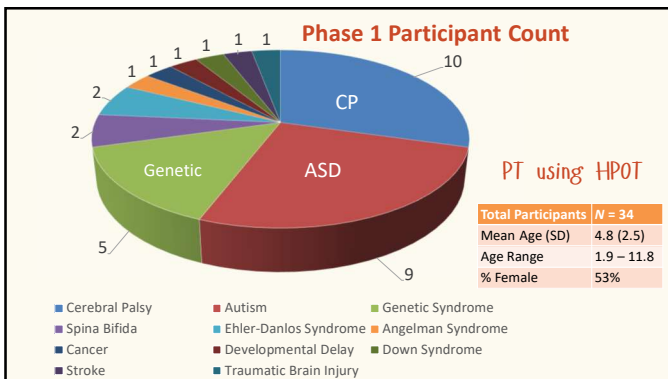
¹⁰Bates D, Mächler M, Bolker B, Walker S 2015 Fitting linear mixed-effects models using lme4. Journal of Statistical Software 67(1): 1-68. doi:https://doi.org/10.18637/jss.v067.i01.

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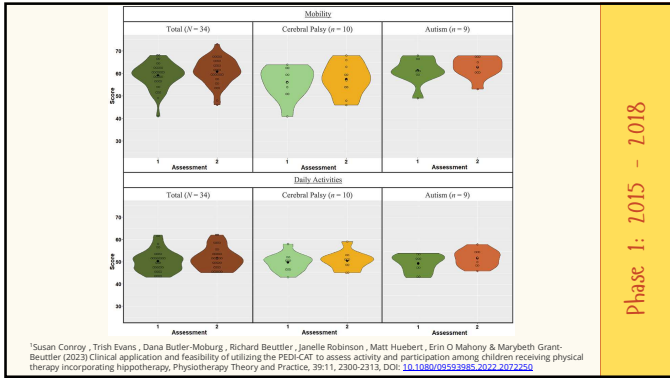
Phase 1 Hypotheses

- 1) The PEDI-CAT will detect changes in Activity and Participation level outcomes for children who participate in weekly PT with HPOT for 6 months.
- 2) The PEDI-CAT will be feasible to use in the PT plan of care when using HPOT
- 3) The PEDI-CAT will enhance clinician decision making and caregiver collaboration in POC

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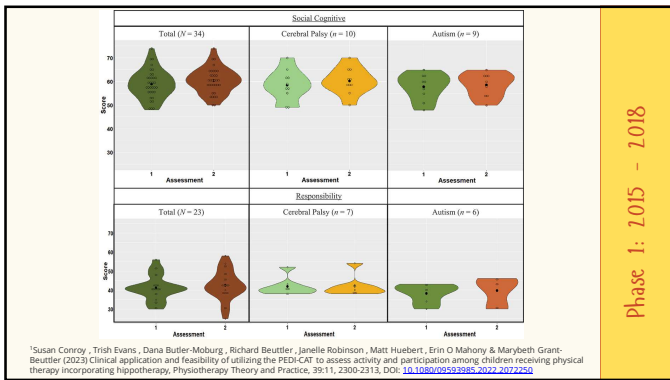
28



Phase 1: 2015 - 2018

¹Susan Conroy, Trish Evans, Dana Butler-Moburg, Richard Beuttler, Janelle Robinson, Matt Huebert, Erin O Mahony & Marybeth Grant-Beuttler (2023) Clinical application and feasibility of utilizing the PEDI-CAT to assess activity and participation among children receiving physical therapy incorporating hippotherapy, *Physiotherapy Theory and Practice*, 39(11), 2300-2313, DOI: [10.1080/09593985.2022.2072952](https://doi.org/10.1080/09593985.2022.2072952)

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Phase 1: 2015 - 2018

¹Susan Conroy, Trish Evans, Dana Butler-Moburg, Richard Beuttler, Janelle Robinson, Matt Huebert, Erin O Mahony & Marybeth Grant-Beuttler (2023) Clinical application and feasibility of utilizing the PEDI-CAT to assess activity and participation among children receiving physical therapy incorporating hippotherapy, *Physiotherapy Theory and Practice*, 39(11), 2300-2313, DOI: [10.1080/09593985.2022.2072952](https://doi.org/10.1080/09593985.2022.2072952)

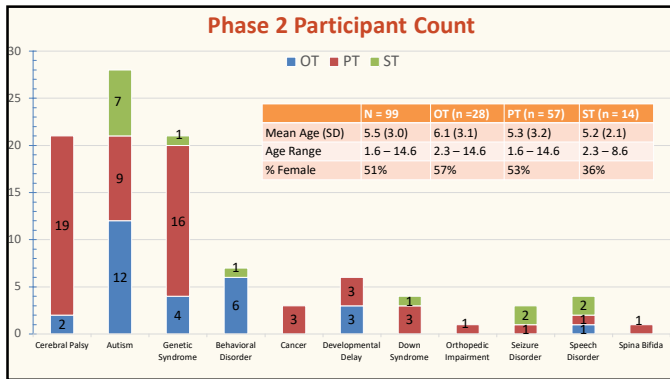
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Phase 2 Hypotheses

- 1) Children will demonstrate the **greatest scaled score improvements** after 6 months of treatment in the domain corresponding to the discipline they are receiving
- 2) Children will demonstrate the **lowest initial scaled scores** in the domain corresponding to the discipline they are receiving



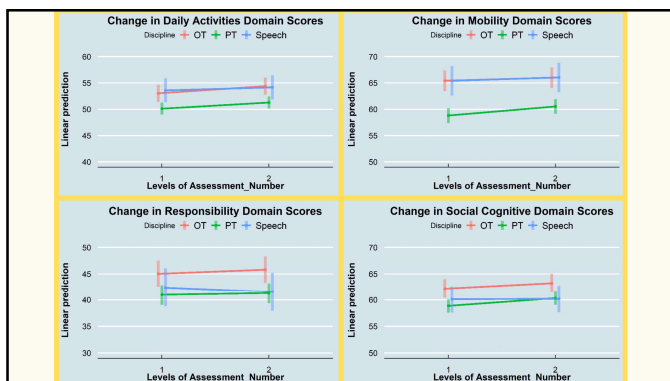
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Phase 2	OT (n = 28)	PT (n = 57)	ST (n = 14)
Daily Activities			
T1 Mean (SD)	53.5 (3.7) H2	49.9 (5.6)	53.6 (4.4)
T2 Mean (SD)	54.9 (2.9)	51.1 (5.7)	53.9 (5.0)
Mean Change	1.4* ($p < 0.05$) H1	1.2* ($p < 0.05$)	0.3
Mobility			
T1 Mean (SD)	65.8 (3.5)	58.6 (7.0)	65.2 (3.0)
T2 Mean (SD)	66.4 (3.5)	60.4 (6.7)	65.9 (2.8)
Mean Change	0.6	1.8* ($p < 0.05$)	0.7
Social/Cognitive			
T1 Mean (SD)	62.7 (4.9)	58.6 (6.8)	59.8 (3.9)
T2 Mean (SD)	63.9 (4.3)	60.0 (6.6)	59.9 (4.2)
Mean Change	1.2* ($p < 0.05$)	1.4* ($p < 0.05$)	0.1
Responsibility			
T1 Mean (SD)	45.2 (6.5)	41.0 (7.9)	41.8 (4.3)
T2 Mean (SD)	46.0 (5.5)	41.3 (8.5)	41.0 (5.2)
Mean Change	0.8	0.3	-0.8

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Future Directions

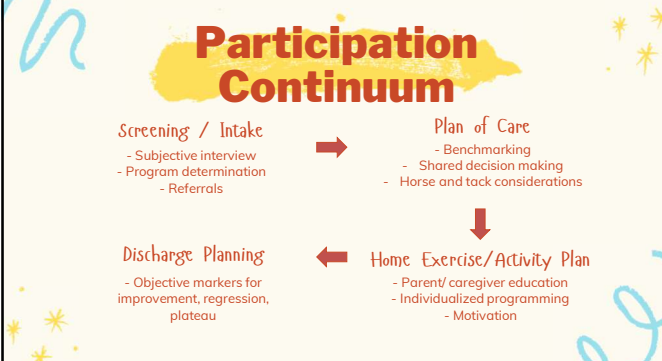
- Utility of PEDI-CAT in SLP
- Responsibility domain across all disciplines
- Waitlist control group vs HPOT intervention
- Different diagnoses
- PEDI-CAT and GMFCS levels for CP
- PEDI-CAT and Goal Attainment Scale
- Larger study population across multiple centers

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#4 Practical Applications

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Participation Continuum

Screening / Intake

- Subjective interview
- Program determination
- Referrals

➔

Plan of Care

- Benchmarking
- Shared decision making
- Horse and tack considerations

↓

Home Exercise/Activity Plan

- Parent/ caregiver education
- Individualized programming
- Motivation

➔

Discharge Planning

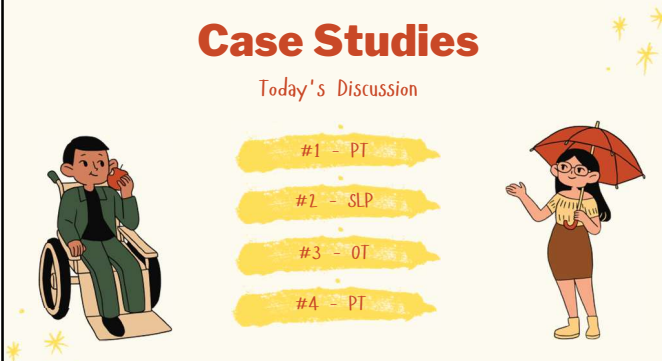
- Objective markers for improvement, regression, plateau

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Case Studies

Today's Discussion

- #1 - PT
- #2 - SLP
- #3 - OT
- #4 - PT

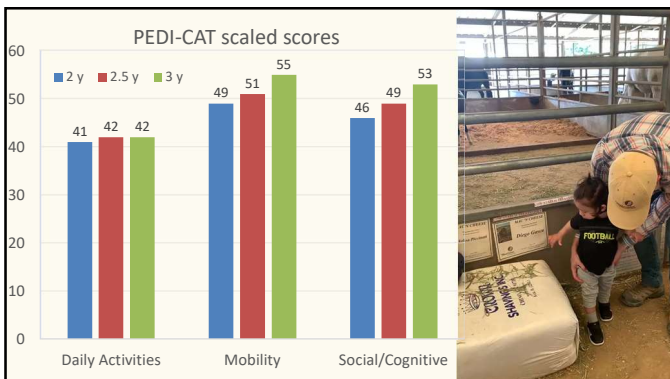


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#1 PT: Levi



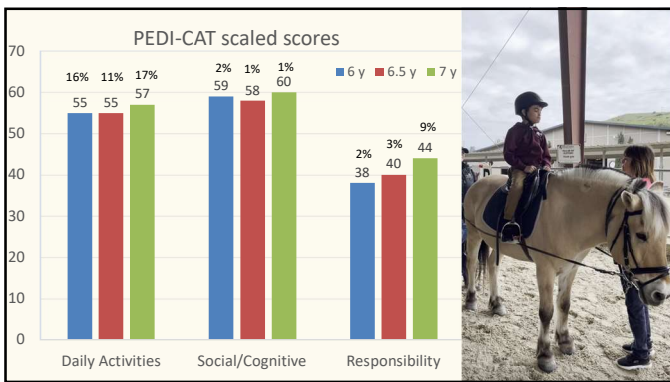
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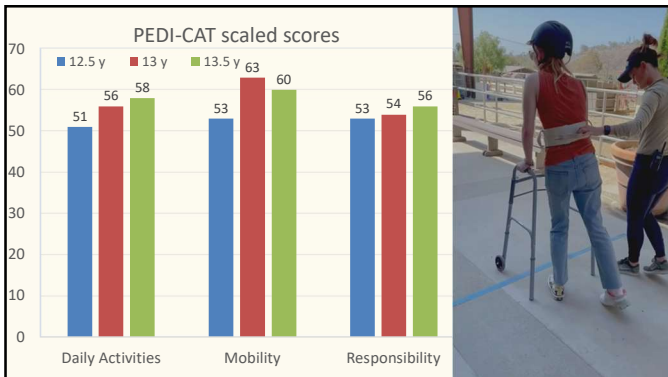
Daily Activities Items

T1 Scaled Score = 53		T2 Scaled Score = 57	
Pulls open a sealed bag of snack food	Easy	Pulls open a sealed bag of snack food	Easy
Cuts laces into sneakers or boots	Unable	Cuts laces into sneakers or boots	A little hard
Puts on and fastens pants	A little hard	Uses a can opener to open a can	Unable
Fastens belt buckle	I don't know	Fastens belt buckle	Hard
Tucks in shirt or blouse	Easy	Puts on and fastens pants	Easy
Puts on winter, sport, or work gloves	A little hard	Tucks in shirt or blouse	Easy
Pours liquid from a large carton into a glass	A little hard	Chops or slices hard fruits or vegetables	Unable
Ties shoelaces	Unable	Puts on and buttons a front-buttoning shirt	A little hard
Puts on socks	Easy	Ties shoelaces	Unable
Puts on and buttons a front-buttoning shirt	Unable	Puts on winter, sport, or work gloves	Easy
Connects and zips zippers that are not fastened at the bottom	I don't know	Pours liquid from a large carton into a glass	A little hard
Puts on a t-shirt	Easy	Connects and zips zippers that are not fastened at the bottom	Easy
Cuts vegetables or meat with a fork and table knife	Unable	Peeles foods such as potatoes or carrots	Unable
Opens door lock using key	Unable	Uses a knife to butter bread and spread jam	Hard

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In Conclusion

- PEDI-CAT + HPOT
- Clinicians + Researchers
- HPOT ↑ Function
- Future Ideas?

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TIME FOR QUESTIONS!

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THANK YOU FOR LISTENING




The Shea Center
for Therapeutic Riding

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References

¹Susan Conroy, Trish Evans, Dana Butler-Moburg, Richard Beuttler, Janelle Robinson, Matt Huebert, Erin O Mahony & Marybeth Grant-Beuttler (2023) Clinical application and feasibility of utilizing the PEDI-CAT to assess activity and participation among children receiving physical therapy incorporating hippotherapy, *Physiotherapy Theory and Practice*, 39:11, 2300-2313. DOI: [10.1080/09593985.2022.2072250](https://doi.org/10.1080/09593985.2022.2072250)

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³Halley S, New England Medical Center Hospital PEDI Research Group. *Pediatric Evaluation of Disability Inventory (Pedi). Development Standardization and Administration Manual. Version 1.0.* PEDI Research Group; 1992.

⁴Halley S, Coster W, Dumas H, Frangola-Pinkham M, Moed R 2012 PEDI-CAT: Development, standardization, and administration manual. Boston: CRE Care.

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⁶Dumas H, Frangola-Pinkham M, Halley S, Ni P, Coster W, Kramer J, Kae Y, Moed R, Lufflow L. 2012 Computer adaptive test performance in children with and without disabilities: Prospective field study of the PEDI-CAT. *Disability and Rehabilitation* 34(5): 393–401.

⁷World Health Organization. *International Classification of Functioning, Disability, and Health: Children & Youth Version: ICF-CY.* World Health Organization, 2007.

⁸Reidens, Rebecca, and Debbie J. Silkwood-Sherec. "Intervention for an adolescent with cerebral palsy during period of accelerated growth." *Pediatric Physical Therapy* 28.1 (2016): 117-125.

⁹Peters, B. Caitlin, et al. "Preliminary efficacy of occupational therapy in an equine environment for youth with autism spectrum disorder." *Journal of autism and developmental disorders* (2021): 1-15.

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