

Is there a research-practice dosage gap in aphasia rehabilitation?

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Introduction

Motivation

- Few studies have evaluated the translation and implementation of evidence-based aphasia interventions to clinical practice¹
- Dosage may be challenging to translate from research to clinical practice settings due to pragmatic clinical barriers such as insurance or transportation
- Anecdotes suggest limited dosage in practice but few comparisons to research
- A dosage mismatch between research and clinical practice threatens the external validity of treatment research & risks attenuating intervention effectiveness.

Research Questions

- What is the typical treatment dose in an episode of care in outpatient clinical practice?
- What is the typical treatment dose administered in contemporary clinical aphasia research?
- To what extent is the dosage in treatment research aligned with clinical practice?

Methods

Clinical treatment dosage estimated via billing data from the Centers for Rehabilitation Services (CRS), primarily in Western Pennsylvania.

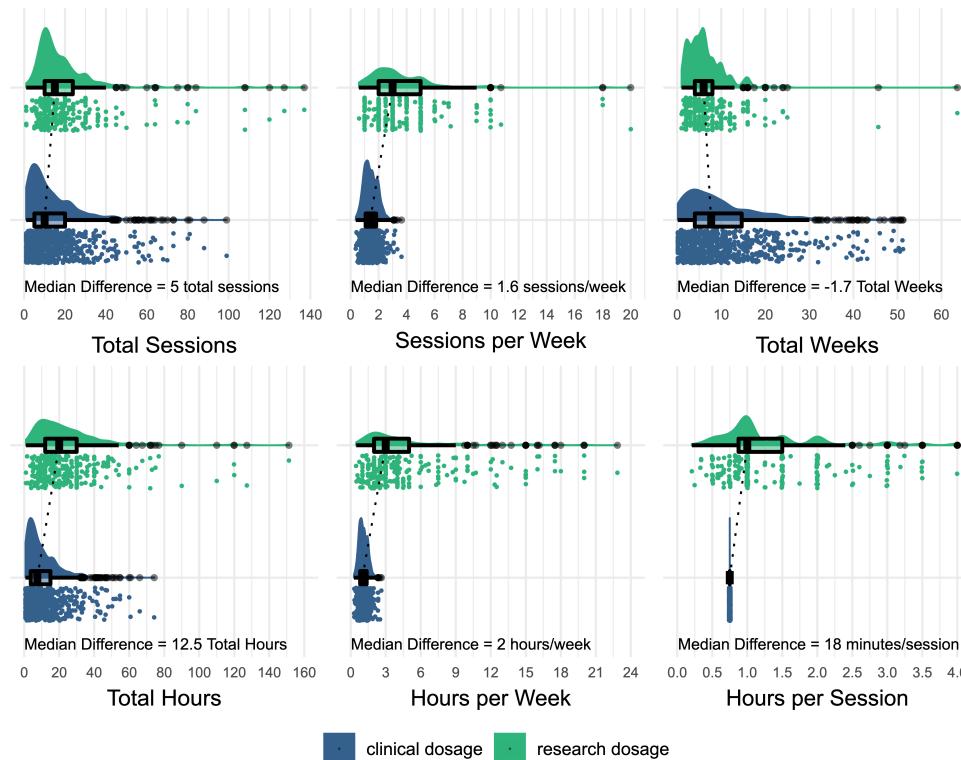
- Inclusion: Patients receiving an evaluation (CPT: 92523, 96105) and treatment (92507) from an SLP from 2014-2019 with ICD 9/10 diagnoses of aphasia and stroke.

Research dosage estimated via scoping review of prospective, aphasia treatment studies from 2009-2019

- Extracted dosage variables and estimated additional non-reported variables if possible
- Reliability (% agreement) for article inclusion/exclusion and data extraction >90%

Analysis: Non-parametric permutation tests⁵

Differences in dosage between aphasia treatment research and clinical practice



Results

Variable	Clinical Dosage				Research Dosage			
	Mean	Median	Min	Max	Mean	Median	Min	Max
Total sessions*	14.50	10.00	5.00	20.00	20.10	15.00	10.00	23.80
Total hours*	10.90	7.50	3.80	15.00	25.10	20.00	12.00	30.00
Hours/session*	0.75	0.75	0.75	0.75	1.30	1.00	0.90	1.50
Hours/week*	1.10	1.10	0.80	1.40	4.70	3.00	2.00	5.00
Sessions/week*	1.50	1.40	1.10	1.80	3.60	3.00	2.00	5.00
Total weeks*	10.60	7.70	4.00	14.60	7.00	6.00	4.00	8.00

Notes: 683 episodes of care included in CRS dataset. Standard treatment session is 45 minutes. Frequency calculated for episodes of care with >= 4 sessions. 303 Treatment studies included in review. > 82.5% reported sufficient details to calculate all dosage variables. *denotes difference in medians: $p < 0.001$

Discussion

Take-aways

- Clinical dosage is frequently less than typical research dosage, except for total treatment duration.
- Total treatment hours and weekly intensity is particularly disparate between settings.
- Comparison does not include differences in priorities between research & clinical settings. Research settings focus on (a single) treatment program, clinicians incorporate multiple approaches, counseling, education, content with paperwork.
- Home practice appears more common in clinical practice,² could reduce disparity in dosage.
- Importance of treatment dosage does not supersede treatment efficacy and therapeutic value

Recommendations

- Select dosage thoughtfully in clinical research, considering clinical practice constraints.
- More research establishing dose-form & evaluating effects of different dosages.³
- Take steps to facilitate home practice for higher-dose interventions (apps and low-tech materials).⁴
- Pragmatic trials to evaluate implementation of aphasia treatments in clinical practice.
- More advocacy needed for access to services, including intensive, comprehensive programs.

References & Acknowledgements

This work was supported by (1) NIH-NCATS TL1TR001858 fellowship awarded to the first author. (2) The SHRS Research Development Fund, University of Pittsburgh. Thank you to Brandon Nguyen and Josh Peckman.

- Roberts, Megan Y, Sone, Bailey J, Zanzinger, Katherine E., et al. Trends in Clinical Practice Research in ASHA Journals: 2008-2018. *American Journal of Speech-Language Pathology*. Published online July 2020. doi:[10.1044/2020_AJSLP-19-0011](https://doi.org/10.1044/2020_AJSLP-19-0011)
- Brown ED, Wallace S, Liu Q, Famularo M. Creating Home Practice Programs for Persons with Aphasia: A Survey of Speech Language Pathologists. *Archives of Physical Medicine and Rehabilitation*. 2020;101(11):e72.
- Harvey S, Carragher M, Dickey MW, Pierce JE, Rose ML. Dose effects in behavioural treatment of post-stroke aphasia: A systematic review and meta-analysis. *Disability and Rehabilitation*. Published online 2020;1-12.
- Beeson PM, Rising K, Volk J. Writing Treatment for Severe Aphasia. *Journal of Speech, Language, and Hearing Research*. 2003;46(5):1038-1060. doi:[10.1044/1092-4388\(2003/083\)](https://doi.org/10.1044/1092-4388(2003/083))
- Bray A, Ismay C, Chasnovski E, Baumer B, Cetinkaya-Rundel M. Infer: Tidy Statistical Inference. Published online 2020.