Using Technology to Empower Home Practice of Rehabilitation

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SPEAKER CONTACT INFORMATION & DISCLOSURES

Speaker:
-Financial: Emily Dubas is an employee of The Learning Corp., the creator of Constant Therapy
-Non-Financial: She has no relevant non-financial relationships.

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• Review research that examines technology-based rehabilitation and identify the key factors that influence outcomes in technology-based rehabilitation
• Introduce Constant Therapy as an example of personalized, technology-based rehabilitation and how it is utilized with clients across the healthcare continuum
• Provide an interactive demonstration of Constant Therapy from a client and clinician perspective
• Review of the reporting capabilities available for both the client and the clinician
• Questions and Discussion
NEUROPLASTICITY

The Principles of Neuroplasticity
(Klein & Jovic, 2006)

1. Use it or lose it
2. Use it and improve it
3. Specificity
4. Repetition
5. Intensity
6. Time
7. Salience
8. Age
9. Transference
10. Interference

The adaptive capacity of the Central Nervous System

The mechanism by which the brain encodes experiences and learns new behaviors

The mechanism by which the damaged brain “relearns” lost behavior in response to rehabilitation

TECHNOLOGY-BASED RESEARCH

Studies Examining Technology-Based Rehabilitation

- Kurland et al. (2018)
- Palmer et al. (2015)
- Fink et al. (2002)
- Rayment et al. (2006)
- Deisenbring et al. (2004)
- Cherney & Halper (2008)
- Manheim et al. (2009)
- LiebBattery et al. (2007)

Reviews Examining Technology-Based Rehabilitation

- Des Roches & Kiran (2017)
- Bogdanov et al. (2016)
- Sigmundsdottir et al. (2016)
- Lee and Cherney (2016)
- Zheng et al. (2016)

"As more and better software programs for the delivery of therapy are developed, there is the possibility to achieve the intensive levels of stimulation and practice necessary to trigger reorganization of neuronal assemblies."

(Sawin, Hilt, & Finch, 2014)

"Computer programs also provide an opportunity for patients to practice more intensely and consistently than what is typical in weekly/biweekly visits to a clinical location."

—in particular, if programs can be devised that allow users under the guidance of clinicians to self-administer the therapy, then limitations of therapists and therapy time can be circumvented.

(Van de Sandt-Koenderman, M. (2011)

"The clinician can offer relevant treatment programs that enable the client to work on his or her own rehabilitation, independently and at his or her own pace."

EFFECTS OF A TABLET-BASED HOME PRACTICE PROGRAM WITH TELEPRACTICE ON TREATMENT OUTCOMES IN CHRONIC APHASIA
Kurland et al. (2018)

21 Participants with Chronic Aphasia
Completed a 2 week intensive therapy program
Post-discharge:
- 6-month tablet-based unsupervised home program with weekly telepractice support
- 4 month follow-up

Kurland et al. (2018)
“Even individuals with chronic severe aphasia, including those with no prior smart device or even computer experience, can attain independent proficiency to continue practicing and improving their language skills beyond therapy discharge”

LEARNING OBJECTIVES

1. Describe findings identified using Constant Therapy with individuals with neurological disorders.

2. Explain how to optimize and personalize your patients’ Constant Therapy programs.

3. Implement reporting features to support treatment decisions, documentation, and plan of care.
WHAT IS CONSTANT THERAPY?

Evidence-based, HIPAA compliant app for speech, language, and cognitive exercises. Created by clinicians for clinicians and patients to access exercises anytime & anywhere. Under one app, there is a clinician and patient version.

Clinician Version

Patient Version

Clinicians assign specific tasks for patients.

Patients start personalized home program.

Clinician analyzes data on usage and performance.

Patient completes CT home program.

EXERCISES FOR MILD THROUGH SEVERE DISORDERS

80 Tasks
12 Levels
100,000+ Exercises

Cognition
Attention
Memory
Visuospatial
Reasoning
Arithmetic

Speech & Language
Phonological Processing
Auditory Comprehension
Verbal Expression
Reading Comprehension
Written Expression
**PUBLISHED RESEARCH**

- How does severity of Aphasia influence individual responsiveness to rehabilitation?: Using Big Data to understand theories of Aphasia rehabilitation. Seminars in Speech and Language, 2016, Kiran, S.
- Effectiveness of an impairment-based individualized treatment program using an iPad-based software platform. Frontiers in Human Neuroscience, 2015, Des Roches, C., Balachandran, I., Ascensao, E., Tripodi, Y., Vlissides, S.
- Development of an impairment-based individualized treatment workflow using an iPad-based software platform. Seminars in Speech and Language, 2014

The complete list of research can be found at [https://www.constanttherapy.com/research](https://www.constanttherapy.com/research)

**FRONTIERS IN HUMAN NEUROSCIENCE**


- 51 patients with stroke or TBI
- 10-week program using Constant Therapy

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=9</td>
<td>n=42</td>
</tr>
<tr>
<td>Clinic visit 1x/week</td>
<td>Clinic visit 1x/week + Constant Therapy home program</td>
</tr>
</tbody>
</table>

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Both groups showed improvement in tasks. However, Constant Therapy home program users showed:

- Greater improvements in accuracy and latency on tasks
- More statistically significant positive changes in standardized tests

Constant Therapy home program users practiced an avg of 6 hours of therapy per week.

DETECTING SMALL AND LARGE FLUCTUATIONS IN LANGUAGE AND COGNITIVE PERFORMANCE: A LONGITUDINAL CASE STUDY
Kiran (2014)

71 year-old male with global aphasia

- Therapy 1x/week
- Used Constant Therapy as homework to supplement sessions
- Consistently practiced after discharge, progressing to more difficult tasks

2nd Stroke:
- Wife noticed a decline in performance on Constant Therapy, which prompted her to contact the doctor
- MRI revealed a new acute L frontal lobe infarct

Therapy Course 2:
- Patient returned to therapy
- Tasks adjusted for new baseline
- Continued to supplement in-clinic sessions with Constant Therapy
- Discharge: Continued home practice throughout the rest of the year
**Dealing with Small and Large Fluctuations in Language and Cognitive Performance: A Longitudinal Case Study**

**Discussion**

**Longitudinal Data:** Decline in performance detected by Constant Therapy preceded the diagnosis of the 2nd stroke.

**Increased Engagement:** Access to technology resulted in consistent home practice during therapy & after discharge.

**Functional Gains:** Family reported overall improvements in social and functional communication over the course of the year.

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**Perspectives of ASHA SIG 15: Gerontology**

Postman (2016)

- 83 year-old female
- Moderate dementia (Stage 5 GDS)
- Moderate-Severe Cognitive-Linguistic Decline
- Residing in special care memory unit

Increased task performance with less cueing

Increased independence with ADLs

Improved safety awareness and adaptation of surroundings

Decreased negative behaviors

Client was relocated from SCU to long-term care unit

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**References**

Kiran (2014)

Postman (2016)
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DEMO OVERVIEW - WHAT TO EXPECT

1. Summary of Clinician Version
2. Personalize patients' Constant Therapy programs with two different patient profiles
3. Access and interpret reports

Ways to Customize Patient Experience:
1) Handedness - Left or Right Handed
2) Repeat Audio Instructions - On or Off
3) Automatic Homework Update: On or Off

Ways to Add a Patient:
1) Create New Client Account (New Constant Therapy users)
2) Add Existing Client (Users who already have a Constant Therapy account)

Ways to Customize Homework:
1) Add tasks
2) Delete tasks
3) Change difficulty level
4) Change item count
5) Change order

Tasks on the homework list will be delivered to your patient when he/she logs into Constant Therapy on his/her own device.

Ways to Access Tasks:
1) Under Skill Area Folders (for example, spoken word comprehension is under the Auditory Comprehension folder)
2) Search Bar (type in name of task or skill you want to work on)

Ways to Access Homework List:
- Search Bar (type in name of task or skill you want to work on)
- Under Skill Area Folders (for example, spoken word comprehension is under the Auditory Comprehension folder)

Ways to Access Tasks:
1) Tweet:
2) Personalize patients' Constant Therapy programs with two different patient profiles
3) Access and interpret reports

Ways to Customize Patient Experience:
1) Handedness - Left or Right Handed
2) Repeat Audio Instructions - On or Off
3) Automatic Homework Update: On or Off

Ways to Add a Patient:
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Tasks on the homework list will be delivered to your patient when he/she logs into Constant Therapy on his/her own device.

Ways to Access Tasks:
1) Under Skill Area Folders (for example, spoken word comprehension is under the Auditory Comprehension folder)
2) Search Bar (type in name of task or skill you want to work on)
PATIENT 1 - HIGH LEVEL PROFILE

In the Clinician Version, we demonstrated the following Constant Therapy Tasks:
1. Symbol Matching, Level 10
2. Alternating Symbol Matching, Level 5
3. Alternating Word Ordering, Level 1
4. Picture In-Depth Memory, Level 3
5. Repeat Number Sequences, Level 4
6. Auditory Word Ordering, Level 3
7. Functional Math, Level 2
8. Inference Voicemail, Level 2
9. Repeat Passive Sentences, Level 3
10. Inference Reading, Level 5

PATIENT 2 - LOW LEVEL PROFILE

In the Patient Version, we demonstrated the following Constant Therapy Tasks:
1. Spoken Word Comprehension, Level 1
2. Symbol Matching, Level 1
3. Spoken Short Story, Level 1
4. Feature Matching, Level 1
5. Picture Spelling, Level 1
6. Name Pictures, Level 1
7. Instruction Sequencing, Level 1

HOME PROGRAM FEATURES

Keeps patients logged in for ease of use
- Patients can practice as frequently and intensively as they choose
- Patients can pause homework any time they wish

Automatic Homework Update:
- Program will change based on patient performance
- Clinician can choose to turn on or off in Settings
- Auto Update will turn on when patients are discharged from therapy

2 patient modes: Simple and Advanced mode

Live Support for patients & family members via phone, email, live chat
LEARNING OBJECTIVES

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3. Implement reporting features to support treatment decisions, documentation, and plan of care.

SOAP Note: Contains baseline and latest scores for the accuracy, latency, and cues.

Email the report to yourself & copy/paste into your electronic documentation.

Analytic Features Accessed by tapping on the score:

1. Item - by - item accuracy
2. Item - by - item response time
3. Screenshots of each exercise
4. In - Clinic vs. At - Home Performance
5. Performance compared to overall Constant Therapy population
View in-depth reports of progress through skill areas, performance on Constant Therapy tasks, and patient-reported outcome measures.

AVAILABLE DEVICES

- iPad
- iPhone
- Android Tablet
- Android Phone
- Kindle
- Fire HD

ABOUT CONSTANT THERAPY PRICING

**Clinician Version**

Free for unlimited use with all your patients in one-to-one sessions

**Client/Individual Version**

15 day free carryover trial for new users

Trial begins when the patient logs into their own device for the first time

Post-trial subscription options:

- $25 for 1 month
- $100 for 12 months*
- $350 for 24 months*

*Tablets available for patients

Constant Therapy currently offers scholarships for those with a financial need
ADDITIONAL INFORMATION & SUPPORT

Getting Started
1. Download Constant Therapy in the App Store
2. Create an account
3. Start adding patients

Constant Therapy Support
Phone: 1 888 233 1399
Email: support@constanttherapy.com

Schedule a Constant Therapy Training
https://constanttherapy.com/app-training

Constant Therapy Research
https://constanttherapy.com/research

Constant Therapy Tasks
www.constanttherapy.com/tasks

*Available live online or in person

Schedule a Constant Therapy Training