Virtual Happy Hour Webinar Series

Hosted by Susan Lin, ScD, OTR/L
FAOTA FACRM

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AMERICAN CONGRESS OF REHABILITATION MEDICINE

REHABILITATION TREATMENT SPECIFICATION NETWORKING GROUP

Community Group WEBINAR

REHABILITATION TREATMENT SPECIFICATION NETWORKING GROUP

23 FEB 2021 7:00 PM ET

Introduction to the Rehabilitation Treatment Specification System: Defining Treatments Systematically



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ACRM AMERICAN CONGRESS OF REHABILITATION MEDICINE

Introduction to the Rehabilitation Treatment Specification System:

Defining Rehab Treatments Systematically

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Carolinas Rehabilitation
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Disclosures

The following presenter(s) have no financial and non-financial conflict of interest relevant to this activity.

- Susan Lin
- Susan Fasoli
- Leanna Katz
- Shanti Pinto

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Learning Objectives

Articulate at least two reasons why current methods of describing rehabilitation interventions are insufficient or imprecise.

Apply treatment classification guidelines as articulated by the Rehabilitation Treatment Specification System (RTSS) to enhance clinical reasoning and critical thinking.

Reflect on opportunities to implement RTSS (e.g., document, communicate) in research, education, and practice.

Case Study: Phyllis

Phyllis is a 64-year-old woman who is a retired school bus driver.

She enjoys walking, eating out at restaurants, and spending time with her grandchildren.

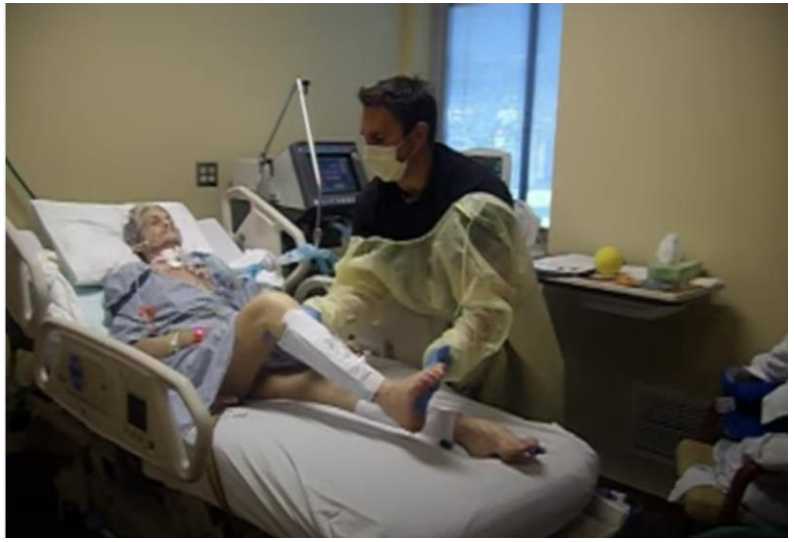
She was diagnosed with acute respiratory failure complicated by sepsis, resulting in a 20-day long ICU stay followed by 3 months in LTACH.

Phyllis' Physical Therapy

PT Long-Term Goal:

Phyllis will ambulate at least 150 feet on level indoor surface with modified independence using least-restrictive assistive device

Phyllis' Physical Therapy Activities



LE PROM/A/AROM and pain management in LE

MOVEO LE resistance exercises

Sit<>stand training and step training with body-weight support

Phyllis' Physical Therapy Activities

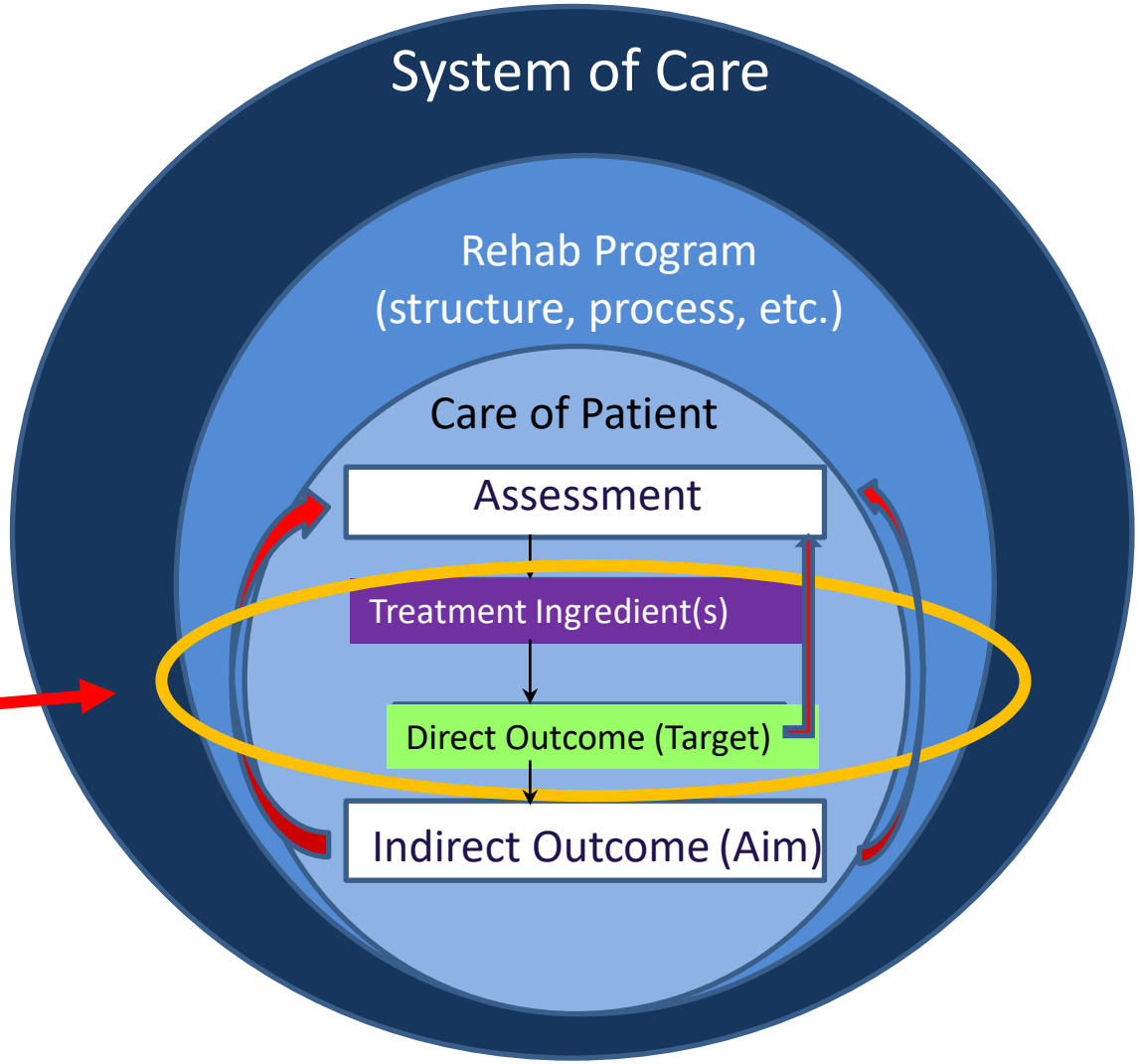
Sit<>stand training and step training without body-weight support

Stationary bicycle continuous movement/exercise

Walking varying distances with various devices

Many Aspects of Rehabilitation Service Provision Contribute to Outcomes

Our focus is here



Resources to Describe Rehabilitation Treatments?

Coding or Documentation Resources

CPT Codes

Treatment duration (# sessions, hours)

Treatment type/modality

Problem being treated (eg, gait training)

Discipline-Specific Frameworks

Occupational Therapy Practice Framework

Guide to Physical Therapist Practice

Nursing Interventions Classification etc.

Resources to Describe Rehabilitation Treatments?

Reporting Guidelines

Consolidated Standards of Reporting Trials (CONSORT) extension for nonpharmacologic treatment interventions

Template for Intervention Description and Replication (TIDieR)

Guidelines for Reporting Evidence-based Practice Education Interventions and Teaching

Consensus on Exercise Reporting Template

Broad Frameworks

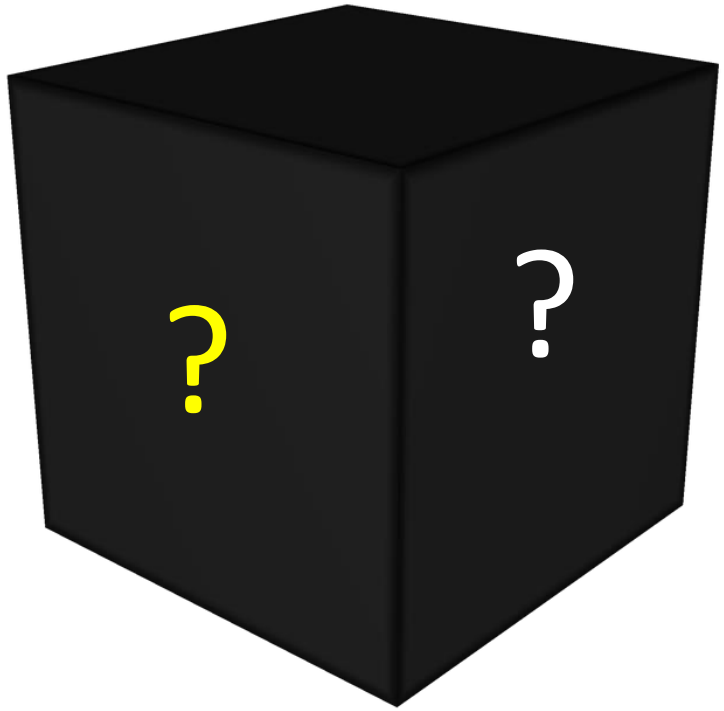
WHO International Classification of Function, Disability, and Health (ICF)

WHO's International Classification of Health Interventions

Black Box of Rehab

Lack a standardized way to define and describe rehabilitation treatments

Cannot efficiently communicate the elements that produce/do not produce therapeutic change



Unpacking Rehabilitation Treatments

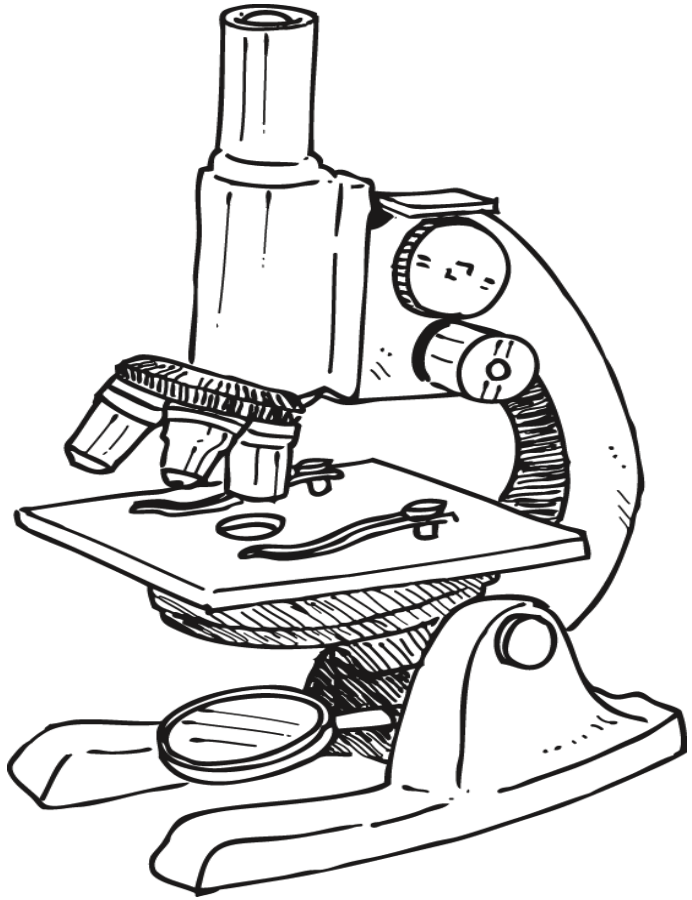
Specify treatments

Think beyond goals and general treatment focus

Analyze Text Case

Which treatments can you identify?

What is the therapist addressing through these treatments?



Back to the Case Study

64Y F with debility due to long hospitalization

PT goal: Ambulate ≥ 150 ft on level indoor surface with Mod I using least-restrictive assistive device

Therapy activities:

LE ROM, LE resistance exercises, stationary bicycle continuous exercise, sit<>stand training, step training with body-weight support, pain management in LE, trial walking with different assistive devices

Treatment vs. Enablement Theory

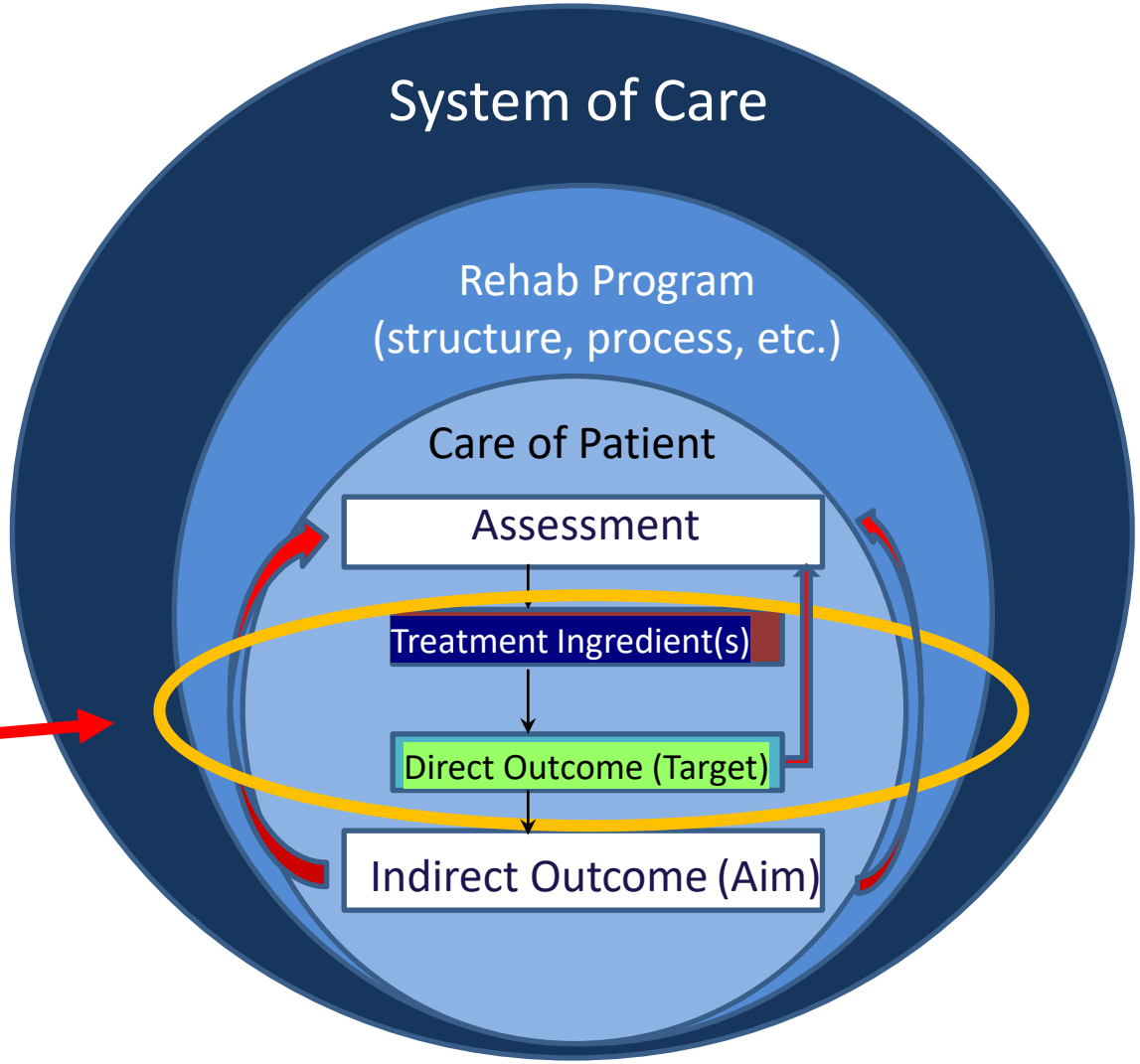
Treatment Theory

- How is the treatment/intervention DIRECTLY changing the target
- Focus on how the active ingredients of the intervention impact the measurable targets

Enablement Theory

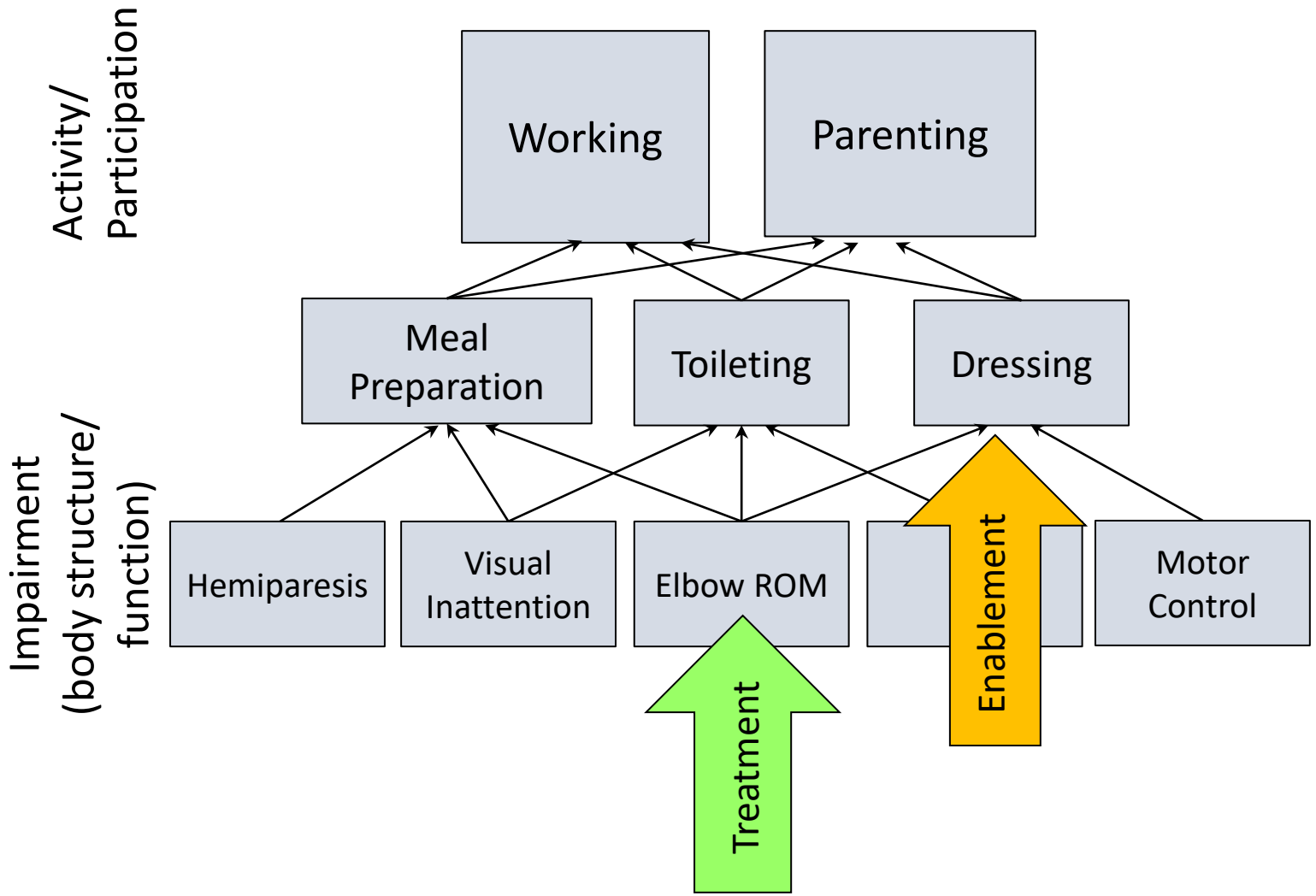
- Connects treatment/intervention to downstream functional outcomes

Many Aspects of Rehabilitation Service Provision Contribute to Outcomes



Our focus is here

Stretching the Elbow



What do these theories tell us?

- Treatment theory
  - Sheds light on the "**active ingredients**" of treatment and how they relate to direct measurable change
  - *How to change* something in the ICF framework

- Enablement theory
  - How changes we make in one area of physical function (via treatment) affect functional outcomes of importance

Both forms of theory are important for treatment and research

What is the RTSS?

Rehabilitation Treatment Specification System (RTSS):

Conceptual framework to specify rehabilitation treatment by connecting clinician actions (ingredients) with predicted changes in functioning (targets)

- Provides guidelines for specifying a treatment based on the underlying *treatment theory* about why/how a treatment works
- RTSS uses *treatment theory* to explicitly specify the *treatment components* of a rehabilitation treatment

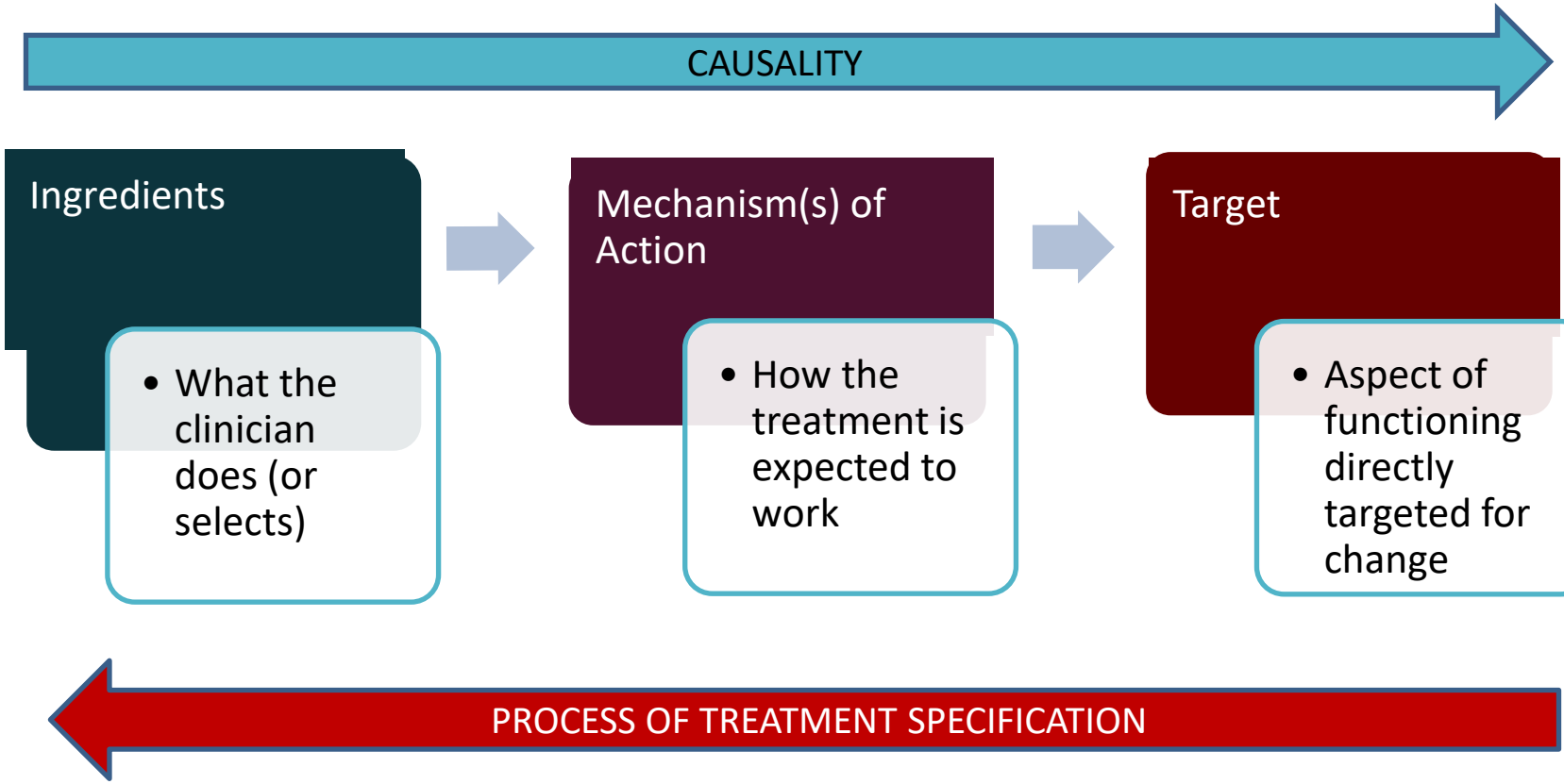
What Is "A Treatment" ?

A rehabilitation treatment is comprised of one or more ***treatment components***:

Each *treatment component* has a tripartite structure:

1. **Direct target**
2. **Active ingredients**
3. Hypothesized **Mechanism(s) of Action**, as defined by the *treatment theory* that underlies the *treatment component*

Treatment Theory's Tripartite Structure



…effects of treatment beyond the target are for enablement theory to explain

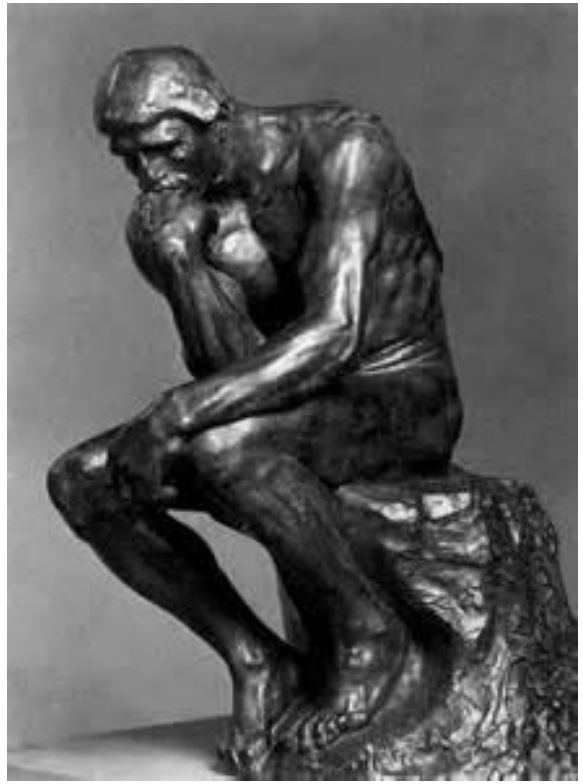
All this will help us to:

THINK more cogently about what we do in rehabilitation, by paying attention to our choices in selecting treatments

Better **COMMUNICATE** what we do in rehabilitation, to colleagues, trainees, and the people we serve

More precisely and effectively **STUDY** relationships between what we do and the outcomes we achieve, so that we can figure out *WHAT* works and *WHY* it works

IMPROVE the quality and effectiveness of rehabilitation

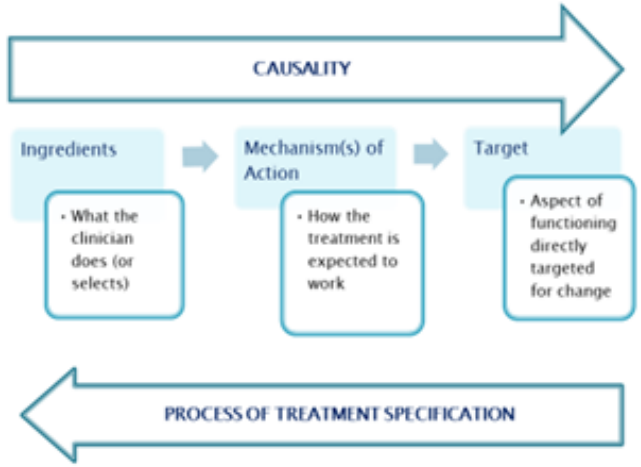


Treatment Target

- *Aspect* of functioning that is hypothesized to be *directly* changed

  ALWAYS observable and measurable (in principle)

  – Otherwise, there is no way of knowing if the selected ingredients are working



Identifying Targets

Not names of problems or impairments

…but measurable aspects of these

Instead of “gait”, target could be:

- Faster gait speed over a certain type of surface

Instead of “social skills”,

- Improved eye contact or turn taking during conversation

Targets vs. Aims

Target

- Aspect of functioning that is changed **DIRECTLY** by treatment
- More immediate result
- Identified in **treatment theory**

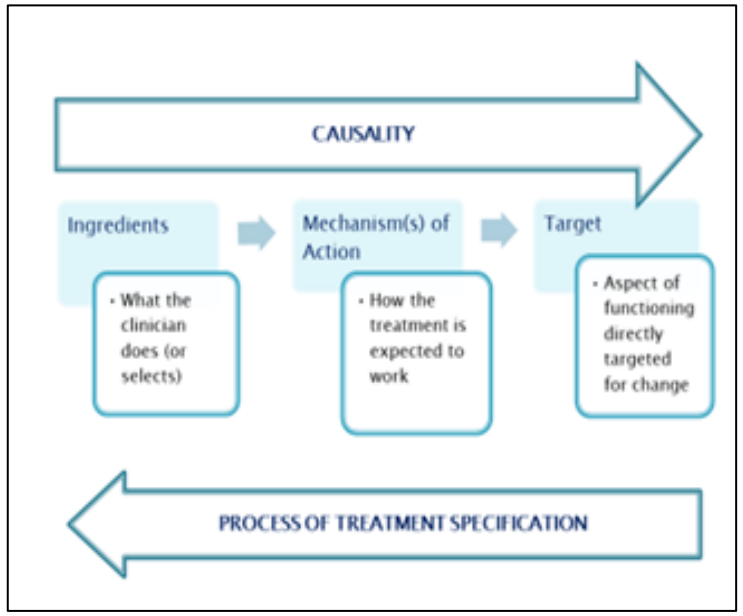
Aim

- Aspect of functioning that is changed **INDIRECTLY**, via changes in other areas of functioning
- Downstream effect of treatment
- Identified in **enablement theory**

Examples

TARGETS	Aims
– Plantar flexor stretching increases ankle range of motion	– Increased ankle range of motion improves walking
– Finger and palmar muscle strengthening increases grip strength	– Increased grip strength improves ability to stabilize objects during meal preparation

Active Ingredients



- Observable actions, devices or forms of energy that are selected or delivered by the clinician
- "Inputs" -

  what the clinician does to effect the desired changes in the ***treatment target***
- Measurable /observable

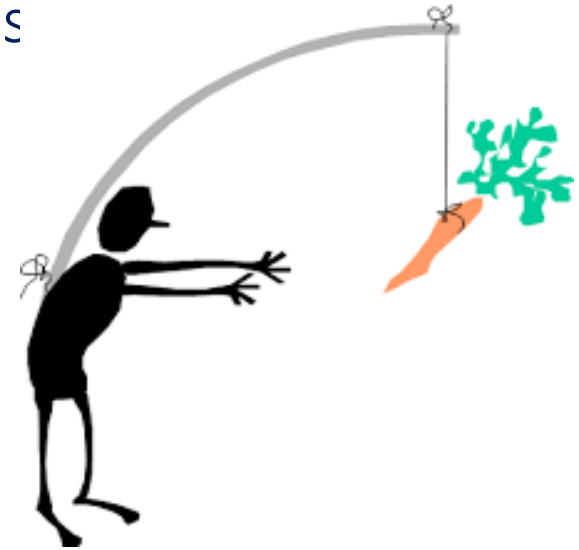
Ingredients can be…

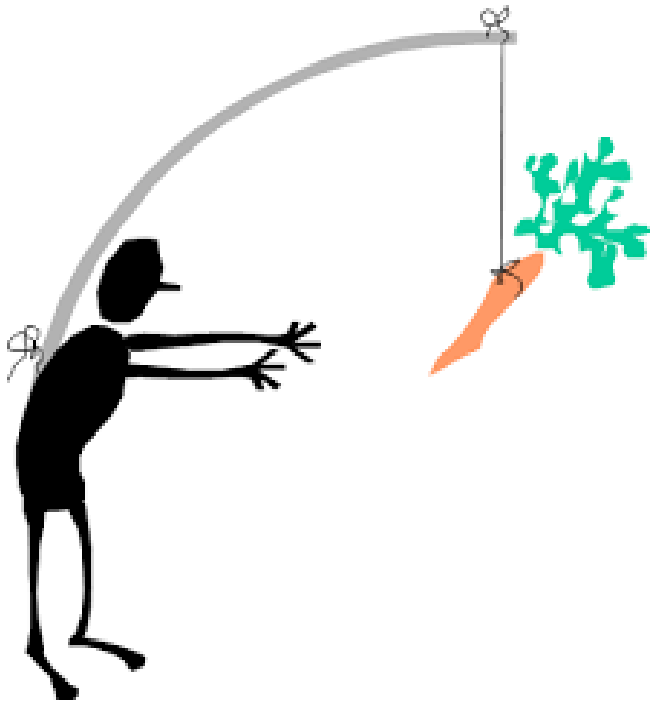
Opportunities to practice an infinite number of skills

Teaching/training methods
- Type of instructions, cues, feedback, error-control methods

Using motivational aids
- Goal setting, persuasion, progress trackers

Providing information/educational materials





Ingredients can be…

Aspects of the environment

- How materials are selected and set-up prior to a task
- Whether distractions are (deliberately) present or not
- Whether peers, e.g., other patients, are (deliberately) present

Devices or other external aids

- wheelchairs, button hooks, planners, etc.

Instruction and practice of strategies to improve performance
- may incorporate devices/aids such as checklists, alarms, etc.

Ingredients planned *across* sessions can include:

Dosing

- Schedules of practice & intensity/ frequency of repetitions
- Schedules of reinforcement

Treatment progression

- If, in what way, and how quickly demands of treatment are progressed to maintain a consistent level of challenge

Transfer/Generalization

- Deliberate variation in environmental conditions/ demands
- Explicit training in when/ where/ how to use a learned routine

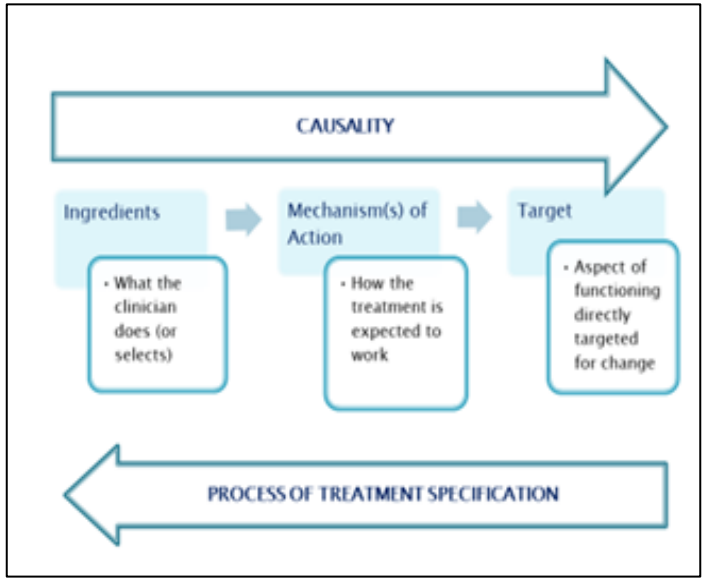
Mechanism(s) of Action (MoA)

- MoA is the process by which a treatment's active ingredients induce change in the treatment target

- MoA is often not observable or measurable, and must be inferred by treatment effects

Examples include:

- Increased sarcomere length following manual stretching of tight muscle
-"Learning by doing" resulting from repeated practice of handling small objects



Mechanism(s) of Action (MoA)

Hypothesized MoA may be used to:

- Articulate treatment theories
- Examine effects of specific treatment components

Clinicians often have an implicit hypothesis about the MoA when they plan treatment

- "Practice makes perfect" via learning

An explicit focus on articulating MoA will help drive science forward

Back to the Case Study

64Y F with debility due to long hospitalization.

PT goal: Ambulate ≥ 150 ft on level indoor surface with Mod I using least-restrictive assistive device

Therapy activities:

LE ROM, LE resistance exercises, stationary bicycle continuous exercise, sit<>stand training, step training with body-weight support, pain management in LE, trial walking with different assistive devices

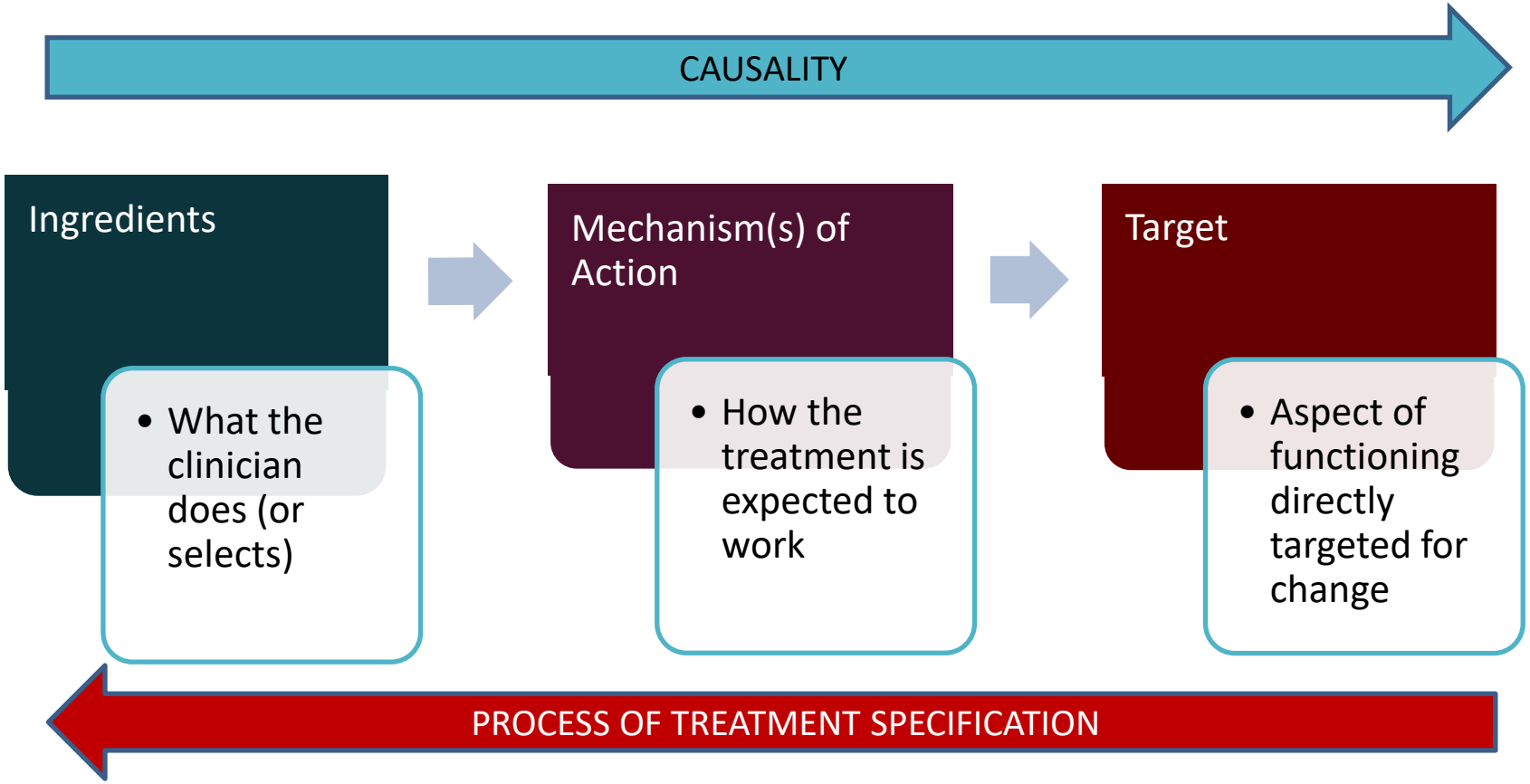
Case Application

Ingredient	Mechanism of Action	Target
Progressive - resistive LE exercises to hip and knee extensors	Increased demand for muscle firing > cellular changes that allow greater force generation	Increased LE stength for sit to stand.
Opportunities for continuous exercise on stationary bicycle at low resistance	Gradually increased demands on cardiovascular system	Improved endurance
Explain importance of energy conservation techniques	Cognitive information processing	Improved knowledge of how to pace activities as endurance improves

3 Treatment Groups in RTSS

Organ Functions	*Changing* or *replacing* organ functions
Skills & Habits	ADLs, Performance, Leisure, Work
Representations	Knowledge, attitudes, feelings– all of which are internally represented in the brain

Clinical Use of Treatment Theory



Group I: Organ Functions

Typical Targets	Changed or replaced organ functions
Mechanism of Action	Varies by organ system: Up- or down-regulation of system; passive learning mechanisms; replacement of organ with artificial one; tissue stretch
Typical Ingredients	Varies by organ system: energy applied to soft tissues; exercise schedules for strengthening/ endurance training; stimulus exposure parameters for habituation; devices for limb replacement

Group I: Organ Functions

Examples of Organ Functions Treatments				
Ingredient	Mechanism of Action			Target
Apply force to a tight muscle	→	Increased sarcomere length	→	Increased joint range of motion
Provide a hearing aid	→	Amplification	→	Improved hearing acuity
Provide repeated exposure to stimulus	→	Passive learning (habituation)	→	Reduced sensitivity to stimulus

Group II: Skills & Habits

Typical Targets	• Improved ability to perform (at both ICF function and activity/ participation levels, and both mental and physical tasks) • New habits
Mechanism of Action	Learning by doing
Typical Ingredients	• Provision of opportunities for repeated practice (with or without increasing demands); • Instruction, cues, guidance, feedback, etc.

Group II: Skills & Habits

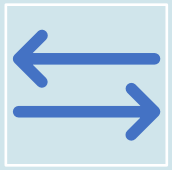
Examples of Skills & Habits Treatments				
Ingredient	Mechanism of Action			Target
Provide opportunities to practice steps from printed list	→	Learning by doing	→	Correct sequence of hemi dressing
Provide opportunities for repeated practice handling small objects of varied sizes	→		→	Improved fine-motor coordination for grasp
Provide opportunities for repeated practice with guidance in setting watch for appointments	→		→	Increased independence in ability to set watch for daily appointments

Group III: Representations

Typical Targets	Amount, completeness; Accuracy of knowledge Changes in attitudes, beliefs, value judgments
Mechanism of Action	Cognitive/ affective information processing
Typical Ingredients	Didactic instruction, Prompts to process new or previously acquired information; Persuasion, motivational techniques Prompts for action

Changes in Representations are on a Continuum: Thought → Action

Some are designed to “stay in the patient’s head” (for future use, or not)



Some are meant to change attitude (propensity to act)

Some are directed to specific actions

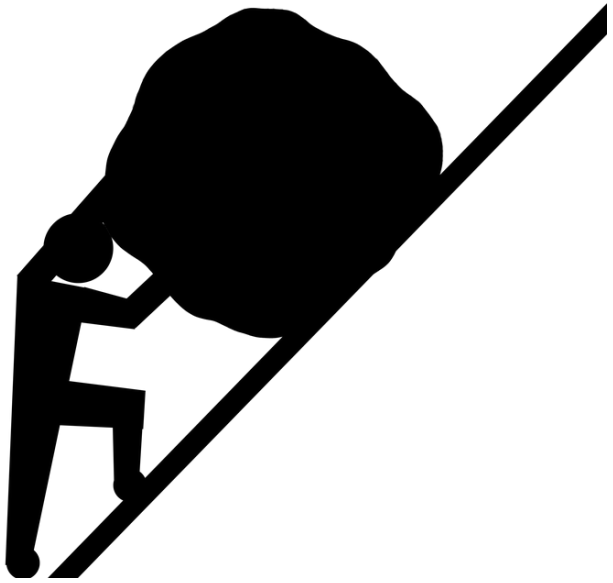
Group III: Representations

Examples of Representation Group Treatments				
Ingredient	**Mechanism of Action**			**Target**
Explain meaning of terms related to aphasia (e.g., anomia, paraphasia)	→	**Cognitive / affective information processing**	→	Increased knowledge about aphasia
Show video of typical speakers to normalize use of gestures in communication	→		→	Increased willingness to use gestures in communication
Explain importance of home practice	→		→	Increased motivation to practice at home

Defining Volition

- *Effort* applied to the performance of an action –
  - **mental** or **physical**

- *Volitional* treatments:
  - require active effort on patient's part
  - applies to vast majority of rehab treatments



When Do Volitional Treatments Occur?

What the patient needs to do for a ***volitional*** (not passive) treatment

Applies to:

Organ Functions	**Skills & Habits**	**Representations**
Some	All	All

Special role of volition and associated ingredients

Volition addresses: lack of attempting to do activity, or engage in treatment

- *– esp. important if treatment is not supervised*
  - *(e.g., home program)*
- Volition Targets
- Volition Ingredients:
  - type of *ingredient* that addresses motivation

Must consider volitional ingredients to ensure sufficient **motivation** & ability to perform as directed

Applying RTSS

Potential Impact

- Clinical practice
- Education
- Research

Clinical Practice

Treatment specification can improve communication:

- Within disciplines – coverage sheet
- Interprofessionally – treatment consistency
- Across rehabilitation settings – continuity of care

Improved clinical efficiency among disciplines contributes to improved quality of care

Caveat & Opportunities

Specification –

will not identify correct target

can aid clinical decision making for patients who do NOT improve

Why did you expect an intervention would work?
What ingredients are needed? Missing?
How does patient/client volition impact performance?

Video Case: Post-Stroke

Treatment session for paretic upper extremity

Source: Helen Hayes Hospital

https://www.youtube.com/watch?v=mOvKq6PyBbc

Focus on the video between 1:26 to 2:30

1. What are the targets?

2. Which treatment ingredients can you identify per target?

Treatment Component		
Treatment Group	Target	Ingredients
Organ Function		
Skills & Habits		
Representations		

Treatment Component		
Treatment Group	**Target**	**Ingredients**
Organ Function	Reduced hand edema	• Repetitive grasp and release of objects to place into basket • Patient positioning - shoulder at 90 degrees flexion, elbow extended, active flexion/extension of fingers
Organ Function	Increased motor control to isometrically co-contract RUE shoulder muscles while maintaining elbow extension	• Patient positioning - shoulder flexion ≥ 90 degrees, elbow extended during ”place & hold” exercises
Representations	Increased knowledge of mechanisms to reduce hand edema	• Verbal instructions re: importance of active motion at hand to reduce edema

Treatment Component		
Treatment Group	Target	Ingredients
Skills and Habits	Increased accuracy of functional reach to target (basket) with RUE	• Opportunity to practice R UE movements while varying position of basket to R/L sides and height above chest-level • Verbal cues to elicit patient attempts to complete R UE movement tasks “Straighten that elbow!” • Model how patient can support his R arm at elbow as needed to increase success of reach • Place hand on his R shoulder; prevent compensatory shoulder movements while reaching

RTSS and Education

Why is treatment specification important for students?

Treatment theories can be linked to specific actions (ingredients) through discussions of treatment targets and ways to deliver intervention

Case studies & client simulations can engender positive habits:

- Clear description of treatment components
- Evaluate fit between ingredients and targets

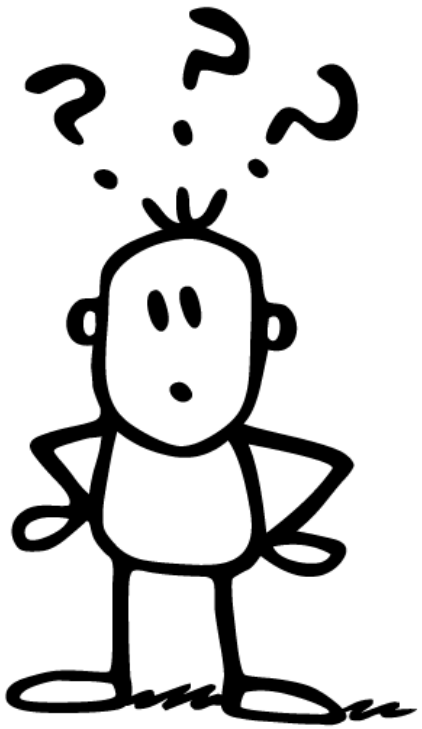
Education

Why is treatment specification important for students?

Provide a structure for treatment modifications/grading:

- Clarify treatment targets (what/in what way)
- Modify treatment ingredients (cues & instruction, dose, prompts to enhance volition)

Equip students with skills needed to critically examine and understand process of therapeutic change



RTSS and Research

- Provide a structured framework for hypothesis testing
- Treatment/enablement distinction may clarify research questions
- Guide selection of outcome measures (appropriate for selected ingredients, target)
- Gives guidance about framing dose in relation to active ingredients
- Assess adherence
- Allow for reproducibility of intervention(s)
- Identify which of the treatment ingredients are most effective

ACRM Rehabilitation Treatment Specification Networking Group

Goal: to advance Rehab Treatment Specification

3 Task Forces:

- Curriculum
- Implementation Assessment
- Communications

- Monthly calls: 4th Tuesdays, 3 - 4 pm EDT
  - Free to join (ACRM membership required for leadership roles)

https://acrm.org/acrm-communities/rehabilitation-treatment-specification/

REHABILITATION TREATMENT SPECIFICATION NETWORKING GROUP

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RTSS Presentations

Look for RTSS content at ACRM Annual Conference and Spring Institute

@ACRMRTS
#RTSS

Spring 2021 Training Institute - https://acrm.org/meetings/2021-spring-meeting/

INTRODUCTIONS, RTSS PRINCIPLES, SPECIFICATION PROCESS & ACTIVITY 1 SETUP (REHABILITATION TREATMENT SPECIFICATION SYSTEM (RTSS): PRINCIPLES AND APPLICATION IN REHABILITATION EDUCATION, RESEARCH, AND CLINICAL PRACTICE IC 28

NOTE *Attendees are expected to watch the recorded course anytime at their convenience & then JOIN the one-hour LIVE discussion with presenters & other rehab. pros on Sat 20Mar.*

DAY Saturday March 20 2021

TIME 4:30 PM – 5:30 PM

PRESENTER(S)

Jeanne Zanca, PhD, MPT, FACRM

Senior Research Scientist

Kessler Foundation

West Orange, New Jersey

RTSS Survey

If you are using (or plan to use) the RTSS, please tell us about it!

Your feedback on this survey could have a direct impact on developing materials to facilitate the application of the RTSS in research, education, and clinical work.

https://redcap.partners.org/redcap/surveys/?s=M4RCRCL7X8

RTSS Q & A

RTSS Manual or Q & A Form

https://bit.ly/3rElYd8

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REHABILITATION TREATMENT SPECIFICATION

RTSS Resources

- Zanca, J. M., Turkstra, L. S., Chen, C., Packel, A., Ferraro, M., Hart, T., . . . Dijkers, M. P. (2018). Advancing Rehabilitation Practice Through Improved Specification of Interventions. *Arch Phys Med Rehabil*. doi:10.1016/j.apmr.2018.09.110
- Hart, T., Dijkers, M. P., Whyte, J., Turkstra, L. S., Zanca, J. M., Packel, A., . . . Chen, C. (2019). A Theory-Driven System for the Specification of Rehabilitation Treatments. *Archives of Physical Medicine and Rehabilitation, 100*(1), 172-180. doi:10.1016/j.apmr.2018.09.109
- Van Stan, J. H., Dijkers, M. P., Whyte, J., Hart, T., Turkstra, L. S., Zanca, J. M., & Chen, C. (2019). The Rehabilitation Treatment Specification System: Implications for Improvements in Research Design, Reporting, Replication, and Synthesis. *Archives of Physical Medicine and Rehabilitation, 100*(1), 146-155. doi:10.1016/j.apmr.2018.09.112
- Whyte, J., Dijkers, M. P., Hart, T., Van Stan, J. H., Packel, A., Turkstra, L. S., . . . Ferraro, M. (2019). The Importance of Voluntary Behavior in Rehabilitation Treatment and Outcomes. *Archives of Physical Medicine and Rehabilitation, 100*(1), 156-163. doi:10.1016/j.apmr.2018.09.111
- Dijkers, M. P. (2019). An End to the Black Box of Rehabilitation? *Archives of Physical Medicine and Rehabilitation, 100*(1), 144-145. doi:10.1016/j.apmr.2018.09.108

Acknowledgements

2008

NIDRR Grant # H133A080053 (2008): Classification and Measurement of Medical Rehabilitation Interventions (Marcel Dijkers, PI)

- John Whyte, Tessa Hart, Mary Ferraro, Andrew Packel, Jeanne Zanca, Theodore Tsaousides

2015

PCORI Contract # ME-1403-14083 (2015): Better Rehabilitation Through Better Characterization of Treatments: Development of the Manual for Rehabilitation Treatment Specification (John Whyte, PI)

- Marcel Dijkers, Tessa Hart, Andrew Packel, Jeanne Zanca, Mary Ferraro, Christine Chen, Lyn Turkstra, Jarrad Van Stan