

## **Symptom-Targeted Approach to Rehabilitation for Concussion (DoD/VA STAR-C)**

### **Clinician Instruction Manual**

**Version 1.4**  
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## STAR-C Clinician Instruction Manual

### 1. Prior to Session 1

Review premorbid history from intake, to identify co-morbid conditions that will influence target selection and ingredients (e.g., mental health history, hearing loss or tinnitus, photophobia, medication history, headaches, sleep). Note these on the Session Planning and Outcome Form.

### 2. Individual Session Guides

Every session begins with a statement of that session's format, and ends with a teach-back by the patient of main take-away points from that session.

#### 2.1 Session 1

The three components of Session 1 are: 1) an introduction to the treatment framework and general structure, 2) identification of preliminary patient goals for treatment, and 3) assessment of the perceived importance of the therapy to the patient, and the patient's confidence and readiness to begin treatment.

In the first session, the patient might wish to discuss topics outside of the scope of the treatment, such as their experiences with other healthcare providers or aspects of their lives that are not directly related to this therapy. Patients also may have other health concerns that could affect their participation in therapy, such as pain. To help focus the patient on the STAR-C treatment, a general principle is to acknowledge the patient's concerns, encourage them to contact relevant providers if appropriate (e.g., contact their pain specialist if they report chronic pain), state that this treatment is intended to focus on specific cognitive complaints, and redirect them to the next item in the manual.

##### 2.1.1 Introduction to the Treatment Framework and General Structure

In this part of the session, the target for the patient is *increased knowledge about the treatment model*. The first ingredient for increasing patient knowledge is to provide an overview of the approach we're using in STAR-C and why we're using it. Here is sample wording to introduce your overview:

"The aim of this study is to identify the most efficient and effective methods for clinicians to use, to help patients with mTBI achieve their goals for cognitive function in everyday life. In this first session, we will be working to identify goals that are most important to you now for treatment. First, I'd like to explain the approach we're using in the study."

Tell the patient that you want to make sure you're both "on the same page" about the treatment approach, so you'll be asking them to tell you back the main points after you explain them. You can ask what might help them remember these main points, e.g., if they'd like to write them down to help them remember. Next, explain these main points of the treatment approach:

- ☐ Our focus is on you doing what you need to do so you can return to being successful in activities that are important and meaningful to you.
- ☐ Our aim is to help you succeed in roles that are important to you, not "re-train" cognitive functions, as so far re-training has not been shown to translate into better function in everyday life.

- ☐ Lots of things can affect your cognitive function (thinking) in everyday life, including personal factors like the amount of sleep you get each night or the things you worry about each day and things in your environment like background noise. In this study, we can work on any of these.
- ☐ This therapy is going to require a lot of practice using strategies, as Practice Makes Habits. **It is critical for the clinician to emphasize the time and effort commitment for the study: it is short and focused, and it will require homework.**
- ☐ Our philosophy is “you can do it, we can help” (borrowed from Home Depot), so we are coaches rather than “fixing” the problem for you.

After you explain the treatment approach, ask the patient to ‘teach you back’ the main points of your explanation. The teach-back is the *outcome measure* for the *target* of increased knowledge about the treatment model. If the patient cannot recall the three main principles listed in Table 2, then use knowledge (R) ingredients in Appendix 1 to teach the three principles. The target is for the patient to understand the principles so the treatment makes sense, not for the patient to memorize them, so patient wording does not have to be exact.

The ingredients, dose, and outcome measures for this target are specified in Table 2.

Table 2. Specification for target to increase patient knowledge about the treatment model.

Target	Ingredients	Dose	Outcome measure
Increase knowledge about treatment model	<ul style="list-style-type: none"> <li>● Explanation of the treatment as aimed at improving function not “mental exercises”</li> <li>● Optional:               <ul style="list-style-type: none"> <li>○ One self-reported problem from pre-assessment (choose any problem as this is for illustration purposes)</li> <li>○ 2 copies of the ICF handout: 1 to demonstrate, 1 to complete with patient (see Appendices 9 and 10)</li> </ul> </li> <li><input type="checkbox"/> Description of session structure: review homework, provide strategies, high-dose strategy practice (“Practice Makes Habits”); and coaching model</li> <li>● Normalizing teach-back (because I speak rehab jargon, tell me in your own words)</li> </ul>	Once	Patient states 3 main principles in a teach-back: <ul style="list-style-type: none"> <li><input type="checkbox"/> Focus on returning to success in meaningful activities and roles, not “mental exercises”</li> <li><input type="checkbox"/> Success requires high-dose practice to make habits</li> <li><input type="checkbox"/> Coaching model (e.g., our philosophy is “you can do it, we can help”)</li> </ul>
		As needed	
		Once	
		Once	

For some patients, it may be helpful to show the ICF model as a figure, and talk through how they may have complaints at different levels of the model beyond just “impairments”. A blank ICF chart for the patient is provided in Appendix 10.

Some concepts to include in your explanation of the ICF are:

- ☐ It is a system used in healthcare around the world, to help describe outcomes from health conditions in a common language.
- ☐ The ICF elements, in lay terms, are: body structure/function (functions include thinking), activities (things you do in a day), participation (your role, like being a soldier, parent, supervisor, employee), environmental factors (people and things around you that can help or be barriers to you achieving your goals), and personal factors (things about you that help or are barriers to achieving your goals).

If you choose to use the ICF handout, you may work with the patient to complete the second copy handout with one of their targets. Show how intervention can target any part of the ICF. Note that it may be possible to identify a target at the participation level (e.g., if the only barrier to employment is remembering to refer to a planner consistently), but more often participation-level outcomes involve multiple targets (e.g., using a planner, reducing distractions in the workplace, asking co-workers to email tasks rather than mentioning them in passing).

Appendix 9 is supplemental material that may be helpful. It is a copy of the ICF handout completed for two health conditions. The first is a soldier with concussion who is limited in his ability to perform at work and as a parent at home. This example may help you explain how intervention can address any of the ICF elements: learning a strategy to help focus on conversations, improving sleep quality, managing pain, educating the family about sources of stress. The second example is a veteran with diabetes, and is included for patients who might need to connect this study with a common condition in everyday life. These examples are provided as a resource, and you may use your own example instead.

### **2.1.2 Problem-focused interview**

The patient will have completed the Common Concussive Cognitive Complaints (C4) Inventory with research staff prior to your first meeting, and you will be provided with a copy of the completed Inventory. In this part of the session, the patient’s problems are translated into goals, and the clinician begins to think about how goals will translate into targets for treatment.

Explain that we will be using the patient’s C4 responses to choose the most important and frequent problems to focus on in therapy. The completed C4 from the baseline session will have the top 3 problems circled. Follow up by asking for details about these three problems, including questions about recency, frequency, impact, and premorbid functioning. Problems should occur at least daily so the patient has opportunities to practice strategies. Questions to facilitate discussion include:

- How often does this happen?
- In what setting is this most disruptive, e.g., home, school, community, work?
- Can you give me an example of this happening in your everyday life?
- What do you do when it happens? Explore how the patient is currently handling the chief complaint, e.g., what general strategies is the patient using now vs. premorbidly, and how are they working?
- What physical or psychological factors influence this [complaint] happening and how you deal with it? It may be helpful to tell the patient how C4 items correspond to different cognitive

functions, so the patient can see how items are related and possibly could be addressed with a single strategy.

- Can you walk me through a day to help me understand how this problem looks for you?

There are two aims for this exercise:

1. ensure that problems occur with sufficient frequency to be targeted in therapy; and
2. begin to translate self-reported “problems” into treatable targets.

**In STAR-C, we are treating 3 targets, so in this first session we need to make sure there are enough problems to generate three targets. The clinician does not have to *specify* targets at this point: the clinician is *predicting* that there will be three targets based on assessment of the patient’s problems and hypotheses about what will help the patient address these problems.**

If the patient identifies enough problems to generate at least 3 targets,  
then proceed to the next step.

If the patient cannot identify problems that can translate into at least 3 treatment targets,  
then they will be **excluded from the study at this point.**

The next step is to begin to translate problems into goals for treatment, e.g., “I get overwhelmed by things I have to do” becomes “I am able to continue working on tasks all day at work”. A goal is likely to have more than one target, e.g., “continuing working on tasks all day” might require learning a strategy to prioritize tasks, consistently remembering to modify the environment to reduce off-task distractions, and creating a script to use with coworkers. In other words, in the RTSS framework, what the patient identifies as a *goal* likely is an *aim*.

Here is an example for a patient who needs a system to help him finish tasks:

C4 Problem: Once I get started, I have trouble finishing things.

Patient’s goal (aim): To develop a system to keep me on track to finish work tasks.

Treatment Targets:

1. Increase knowledge about available options for task cueing and tracking (R target).
2. Increase skill in using identified task tracker, with progression from isolated task to real work tasks in session (S target).
3. Increase likelihood of using task tracker for work tasks on two consecutive workdays between therapy sessions (S target with extra R(V) ingredients to increase motivation).

These are *preliminary* goals because they may be revised after the patient takes the Treatment Goal Worksheet home to think about whether the problems the patient identified are what they want to address first, and goals and targets derived from these problems also may be modified over time based on patient success and experience.

Emphasize to the patient that these are problems and goals the patient wants to work on *in this study*, and that they may receive treatment after STAR-C. Also, a strategy that helps with one problem might help with other problems as well.

Provide the patient with the Session 1 Handout – Treatment Goal Worksheet in Appendix 6 to take home, to evaluate and reflect on whether these should be the first three problems to focus on in treatment. Add the three problems to the worksheet while the patient is in the session. You may complete the importance, confidence, and readiness ratings with the patient during the session, or leave the patient to complete the ratings after the session. In either case, the patient must take the form home with them to reflect on the problems and make sure they are important and frequent enough to target in treatment.

After this session, you will begin to plan for treatment, translating the patient’s goals into treatment targets. Note that a target is the aspect of patient function that will change – i.e., achieving it may require a *progression* of activities over sessions. For example, if the target is to use an app *most of the time* to enter tasks to do, the first step might be to use it *once* after a session, with increasing amounts as the patient improves in performance.

Your treatment planning will include pre-selecting a strategy or strategies you might teach the patient, based on their goals and characteristics and the environment in which the strategy will be used. Tools for choosing a strategy are provided in the Clinician Resources. At this point, you should have a general plan for strategies that may work for this patient, which will be refined into targets, ingredients, and activities for each session. Resources for strategy ideas are provided in the STAR-C Clinician Resource Manual.

### 2.1.3 Assessment of Importance, Confidence, and Readiness to Begin Treatment

This part of the session has one component: to evaluate Importance/Self-Efficacy/Readiness to begin therapy. The clinician will use the visual analog scale “ruler” shown below, with, if needed, R ingredients to increase Importance/Self-Efficacy/Readiness ratings to meet criteria for study entry.

To introduce this part of the session, use language like this:

“Now that we’ve talked about the general therapy approach, the next step is to ask how important this therapy is to you right now and how you feel about giving it a try.”

Use the ruler provided with your treatment materials and shown below (and see Appendix 12), and ask the questions listed below the ruler.

#### Ruler

1	2	3	4	5
Not at all		Somewhat		Extremely

#### Importance

On a scale of 1 to 5, how important is it for you right now to participate in this study to work on these problems?

If less than 4: Why did you chose a (what you chose) instead of a 4 or 5? What would it take to move to a 4 or 5?

If, after discussion, the patient does not indicate a 4 or 5 for importance, consider excluding from study.

### **Self-efficacy (Confidence)**

On a scale of 1 to 5, how confident are you that you can commit to completing this treatment?

### **Readiness**

On a scale of 1 to 5, how ready are you to give this treatment a try right now?

If the patient's answer to the self-efficacy or readiness question is less than 4, ask the patient why they chose that number and what it would take to get to a 5. Respond to their answers using R ingredients in Appendix 1, with the target of getting the patient to a 4 or 5. The patient must respond to all three questions with a 4 or 5 to start treatment.

If, after the readiness intervention and discussion, the patient still does not respond with a 4 or 5 for a goal, then **exclude from the study**.

Conclude the session with a summary of the main session elements. Example wording for the summary is:

“In this session, we talked about the main principles of this treatment, including that we’re focusing directly on your success in everyday activities rather than hoping that ‘brain gym’- type exercises will translate to everyday, and that ‘practice makes habits’. You summarized those main points for me to make sure we’re on the same page. Then we talked about how important it is to you to participate, how ready you are to start the study, and your confidence that you can commit to completing it. Does that all sound accurate?”

## **2.2 Session 2**

The components of Session 2 are: 1) review the Treatment Goal Worksheet to confirm the problems are frequent and important enough to address, that the patient is ready to start therapy and confident they can work on those problems, and the problems and associated goals are sufficient to generate three targets; 2) identify a Quick Win target; and 3) assess the perceived importance of the Quick-Win target to the patient, and the patient's confidence and readiness to begin working on that target.

### **2.2.1 Confirm the patient's goals and that they can be translated into three treatment targets**

Begin by checking in with the patient and summarizing the previous session. Review the initial problem areas and goals the patient identified, and make modifications as needed based on the patient's reflections since the last session. Again, these are preliminary goals that may be modified as the study progresses and the patient gains experience with the therapy.

#### **2.2.2 Identify a Quick-Win target**

The next task is to choose one of the patient's goals and translate that into a target that can be addressed for a **Quick Win**. A Quick Win is a target that the clinician believes is easily achievable by the patient in one session and will increase the patient's engagement with and motivation for therapy.



Ask the patient:

“Looking at the three goals you identified last time, which one would you like to work on first?”

Encourage the patient to choose the goal they think is most important and addresses a frequent problem. Once the patient has chosen a goal, identify a Quick Win target that advances the patient toward achieving that goal. Specify the target, ingredients, and an outcome measure for the Quick Win target. Appendix 7 lists steps for specifying targets, ingredients, and outcome measures; and Appendix 8 shows example specifications. Note that your ingredients and outcome measures must match the target group: skill and habit (S) ingredients and outcome measures for S targets; ingredients and outcomes appropriate for mental representations (R) for R targets.

If you are training an S target, then it is critical that you provide the patient with *opportunities to practice* the strategy during the session, so you can ensure they have the skills to complete it. **Providing opportunities for practice is the essential ingredient for skill and habit targets.** S targets are met in two steps: practiced to mastery within the session, then practiced as homework outside of the session. Appendix 1 has example ingredients for S targets.

Once the patient demonstrates mastery of the strategy within the session, guide them to identify a measurable Quick-Win **homework** target (e.g., a specific number of times to practice using the strategy before the next session). Scale the homework target using Goal Attainment Scaling (GAS) following the instructions in Appendix 3. Note that the scale must be along one dimension (e.g., frequency, accuracy) with approximately equal intervals between scale items. It is recommended that you collaborate with the patient to identify scale items.

To ensure the patient completes practice outside of the session, the clinician specifies a separate R target to “increase likelihood of completing the homework”. This separate target is specifically related to increasing motivation and engagement. Appendix 2 has more information about specifying volition targets for homework, and Appendix 1 has example ingredients to increase volition. The homework R(V) target should be recorded in your session notes but *is not counted in the total of 3 targets for treatment*. We are documenting these R targets so that if treatment is unsuccessful we can determine if it was due to lack of skill or lack of engagement/motivation, as these two problems have different implications for ongoing treatment.

A template R(V) target is specified in Table 4. You may use this template for the Session 2 R(V) target, and modify it for targets for other sessions.

Table 4. Specification for homework target.

Target	Ingredients	Dose	Outcome measure
Increase propensity to complete homework	<input type="checkbox"/> Homework instructions <input type="checkbox"/> Self-efficacy ruler for homework practice <input type="checkbox"/> Volition ingredients (see Appendix 1) <input type="checkbox"/> GAS scale developed with	<input type="checkbox"/> Once <input type="checkbox"/> Once <input type="checkbox"/> Once <input type="checkbox"/> Once	Report next session that homework was completed

	<p>patient</p> <p><input type="checkbox"/> Handout with homework assignment (e.g., tracking sheet for home practice) and GAS scaling for home practice</p>	<p><input type="checkbox"/> As needed</p>	
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### 2.2.3 Assessment of Importance, Confidence, and Readiness to Work on the Target

Complete the importance, self-efficacy, and readiness rulers for the homework target. Use the ruler provided with your treatment materials and shown below (and see Appendix 12), and ask the questions listed below the ruler. The specific wording will depend on the target and the nature of the homework (e.g., number of times the are expected to practice and in what circumstances).

#### Ruler

1	2	3	4	5
Not at all		Somewhat		Extremely

#### Importance

On a scale of 1 to 5, how important is it for you to [complete the homework] between now and our next session?

If less than 4: Why did you chose a (what you chose) instead of a 4 or 5? What would it take to move to a 4 or 5?

If, after discussion, the patient does not indicate a 4 or 5 for importance, consider modifying the target or choosing another target.

#### Self-efficacy (Confidence)

On a scale of 1 to 5, how confident are you that you will [complete the homework] between now and our next session??

#### Readiness

On a scale of 1 to 5, how ready are you to [complete the homework] between now and our next session?

If the patient's answer to the self-efficacy or readiness question is less than 4, ask the patient why they chose that number and what it would take to get to a 5. Use ingredients that increase propensity to do homework (as in Table 4 and see Appendix 1). If the patient does not respond with 4 or 5 on both scales, modify homework expectations (e.g., practice using the strategy 3 times instead of 10, choose a different type of practice). The patient must respond with 4 or 5 on all scales to move to the next step.

Conclude the session by asking the patient to “teach back” or recap the main session elements, particularly the target you worked on and the homework. The outcome measure for this teach-back is that the patient accurately states their homework for the next session.

## 2.3 Sessions 3 –10

Prior to each session, the clinician will review the previous session to plan for the next session. Planning includes identifying or modifying treatment targets based on the previous session's progress and identified needs, and selecting ingredients that may be used during the session (i.e., specifying targets and ingredients). General procedure for specification are described in Appendix 7.

The following are key considerations in selecting ingredients:

- ☐ Choose the ingredients that you hypothesize will be effective for that patient and target.
- ☐ Ingredients must match target categories (i.e., S-type ingredients for habit and skill targets, R-type ingredients for knowledge and attitude targets). Note that some ingredients can be used for any type of target (e.g., instructions, feedback, practice).
- ☐ Volition ingredients can be added to therapy for any target group, to promote patient engagement in therapy task (e.g., *providing encouragement* if the patient finds a task difficult or makes errors in practice). It is not necessary to have a separate R(V) target if ingredients are used in this way. If, however, knowledge or attitudes appear to be barriers to beginning to address the main target, it may be necessary to add an R(V) target first (e.g., if the patient is self-conscious about using a strategy, the clinician may need to identify an R(V) target of “increasing the patient’s comfort with trying a strategy” and address this with volition ingredients before starting the S target).

The general format of each session is:

- ☐ Give an overview of the session structure (review homework, practice strategy, assign new homework) and session aims (e.g., to practice using the strategy under progressively more demanding conditions, as steps toward reaching the target).
- ☐ Review homework and score using GAS criteria set by the patient and clinician in the previous session.
- ☐ Ask patient to self-evaluate opportunities for practice: were they able to practice more or less than they expected and needed, and if less, what can be modified to ensure the patient has adequate practice?
- ☐ Ask the patient to self-evaluate strategy effectiveness and make modifications accordingly.
- ☐ If needed: identify targets/ingredients for motivation/self-efficacy (e.g., reminders of goals, feedback on progress, pros and cons).
- ☐ Determine if that target requires more training and specify ingredients and activities as needed.
- ☐ If target is achieved per patient report, identify next target for treatment. If the patient cannot identify another target, intervention is concluded and the patient proceeds to post-intervention evaluation. If the patient can identify another target, move on to that target, with ingredients as needed.
- ☐ Practice the target in session to the extent possible. Elicit feedback from the patient on target performance and modify the target if needed based on feedback.
- ☐ Give homework assignment, with R target.
- ☐ Complete self-efficacy, importance, and readiness ruler ratings for homework targets. Note: it may take more than one session to get to the point of assigning target practice as homework, e.g., if you need more information or discussion with the patient. In that case, complete the ruler for the last target completed, to ensure the patient is continuing to use that target. For example, if the Quick-Win target was to say “I’d like to take some time to give you a more thoughtful answer” in two

interactions with their employer (for a patient who has problems responding quickly), and the patient achieved that, and you are now working on a new target that is not ready for transfer, complete the ruler ratings for continued use of the sentence.

### 3. Final Session

The target of the final session is to increase the patient's propensity to continue strategy use after treatment. For this target you will need two types of ingredients: 1) volition ingredients to increase motivation and self-efficacy; 2) ingredients for a formal plan for maintenance.

Example volition ingredients to increase motivation and self-efficacy are listed in Appendix 1, and may include:

- ☐ Encouraging the patient to keep working on goals.
- ☐ Encouraging the patient to modify strategies if there's a change in setting or situation.
- ☐ Emphasizing importance of continuing to practice.
- ☐ Comparing and contrasting current performance with pre-study performance.
- ☐ Reviewing the ICF, or introduce it if not done in Session 1, and discuss positive effects of intervention.
- ☐ Discussing pros and cons of using strategy on an ongoing basis.
- ☐ Discussing opportunities to serve as a model for others in the future.
- ☐ Reviewing barriers to implementation during the study and how they overcame those.
- ☐ Asking the patient to recap what they learned: writing down the most helpful strategies and those that were most difficult and reflecting on those; and then writing down how they will use these strategies in the future.

The formal plan for maintenance may include:

- ☐ Identifying a reminder/cueing system and setting it up during the session (e.g., patient enters the reminders in their phone during the session)
- ☐ Creating a written or oral contract with specific criteria (e.g., "I commit to checking my list once each day from Monday to Friday").

## Appendix 1. Example Ingredients

### Ingredients for Representation (R) knowledge targets from Dunlosky et al. (2013)

Notes:

- ☐ These are the subset of techniques with the strongest evidence of usefulness for learning new declarative information and generalizability of learned information to different contexts.
- ☐ The techniques are included here as therapist ingredients for R targets (e.g., increase knowledge about facts or concepts in therapy), but they also can be taught to patients to use themselves outside of therapy (e.g., patient can learn the habit of self-quizzing at the end of each section of to-be-learned material at work). In that case they would be stated as S targets (e.g., increase use of self-quizzing after each page of text) with S ingredients (e.g., opportunities for high-dose spaced practice).
- ☐ Techniques that *should* work but don't have strong evidence for generalized benefit include: summarization, highlighting, re-reading, keyword mnemonics, visual imagery.

Ingredient	Definition	Examples
Elaborative interrogation	Generating an explanation for why an explicitly stated fact or concept is true. The process of generating the explanation increases learning and retention of the stated fact or concept, especially if true answer is contrasted with false answer and if the learner has prior knowledge related to the answer.	Why are we using the ICF model rather than a medical model for this study? Why would it be important to practice daily rather than many times on one day per week?
Self-explanation	Related to elaborative interrogation, but used more for explaining thinking and knowledge while performing a task, e.g., explaining steps taken during problem solving. Most effective if the learner is prompted to explain what they're doing while they're doing it, vs. retrospectively.	How is using this strategy is different from what you have been doing? Why are you using this strategy to remember dates?
Successive Relearning	SR is a combination of practice testing and distributed testing (below), and has the strongest evidence of sustained benefit for learning new facts and concepts. Practice testing is the <i>what</i> , and distributed practice is the <i>how</i> .	See below.
Practice testing	Self-testing or taking practice tests over to-be-learned material. Testing that is completed as a <i>low-stakes or no-stakes</i> practice or learning activity vs. standardized tests, and encompasses any form of practice testing that learners can engage in on their own. Benefits are from two cognitive sources: 1) pretest studying => retrieval, and 2) testing => feedback => posttest studying => more retrieval.	Use of flash cards, short quizzes pre- and post-teaching, teach-back of content. Can be verbal or visuospatial materials (e.g., locations on a map).

Distributed practice	Implementing a schedule of practice that spreads out study activities over time. There are spacing effects (advantage of spaced over massed practice) and lag effects (effects of increasing spacing over time). Lag effects have no incremental benefit when there is practice testing, and repeated testing is more effective than repeated studying alone. Learning can be facts, concepts, or skills. Better effects if learner is trying to learn vs. incidental learning, and less for highly complex tasks.	Schedule multiple sessions per week and add R motivation ingredients to increase home practice.
Interleaved practice	Implementing a schedule of practice that mixes different kinds of problems, or a schedule of study that mixes different kinds of material, within a single study session	

**Ingredients for Representation (R) knowledge targets from the RTSS Manual:**

Ingredient	Examples
Providing information in multiple modalities	Explaining the ICF with both a verbal explanation and a graphic
Guiding performance	Talking through a sequence step-by-step or providing hand-over-hand guidance
Providing cues	Giving a semantic or phonemic cue if the patient can't recall a term
Providing feedback (e.g., evaluative, encouraging)	Telling the patient that 3 of 4 responses were correct or "that's a good start"
Using specialized sequence training methods, e.g., spaced retrieval, backward/forward chaining, vanishing cues	Using spaced retrieval schedule to train new vocabulary or concepts
Changing frequency or directiveness of cues (i.e., using a cueing hierarchy)	Providing most-to-least cues as patient improves on a performance aspect (speed, accuracy, effort, frequency)
Using organizational methods, e.g., chunking, outlining, scaffolding	Using the ICF as an organizational framework for teaching the patient about the treatment approach and targets vs aims
Prompting rehearsal	Asking the patient to practice teach-back before

	telling you
Linking to prior knowledge	Explicitly connecting specific treatment targets to the patient's everyday complaints
Using Socratic questioning	<i>See below</i>
Providing internal aids (e.g., mnemonics) or external aids (e.g., assistive devices)	Giving handouts
Encouraging patient to problem solve	Ask patient what would help him/her remember the information
Selecting and positioning materials to facilitate learning	Keeping the workspace uncluttered so patient can focus on the treatment materials

#### Socratic questioning:

Socratic questioning is based on the Socratic method of teaching, a dialogic method in which the teacher asks questions that prompt critical thinking and lead students to arrive at an understanding of a concept (Wikipedia has a good discussion of Socratic method and Socratic questioning). Socratic questioning is also used in cognitive-behavioral therapy to lead the patient to re-examine his or her beliefs about distressing subjects, and that's close to its potential use in STAR-C. To use this method, the therapist must have a clear vision of what the patient should understand, and be prepared with a logical argument. For example, Socratic questioning could be used to prompt patients to question their assumption that only mental exercises can improve everyday cognitive functions:

- ☐ What types of activities did you do as part of your previous "brain building" therapy?
- ☐ When you were doing those activities, did you end up with a certain "mind-set" or strategy that helped you be successful?
- ☐ In this therapy, we're going right to that strategy rather than hoping it comes up indirectly while someone is practicing mental games.

Or:

- ☐ I see in the notes that you're having trouble sleeping.
- ☐ How might sleep affect thinking?
- ☐ Is it possible your lack of sleep is having those effects?

**Ingredients for Representation motivation/self-efficacy (R(V)) targets from Michie et al (2013) BCT:**

Ingredient	Examples
Mental rehearsal of successful performance	Let's think through the steps you would follow to use this at home.
Self-talk	What could you say to yourself to increase your confidence?
Focus on past success	Can you give me an example of a time you were successful? What did you do to be successful that time?
Verbal persuasion to boost self-efficacy	I've observed you doing X, which would help you be successful in this treatment
Persuasive argument	What information could I or others provide that would help you decide if this would work for you?
Pros and cons	What would be the up- and down-sides of using this strategy?
Comparative imagining of future outcomes	Imagine where you might be in 6 months with vs. without this intervention.
Identification of self as role model	[Maybe as role model for other soldiers?]
Self-affirmation	What are your good qualities that will help you succeed in this intervention
Identity associated with changed behavior	Would this help you fulfill all your life roles?

**Ingredients for Representation motivation/self-efficacy (R(V)) targets from the SCORE Manual:**

Ingredient	Examples
Reframing cognitive symptoms as nonspecific and multifactorial	Lots of things can affect memory, like not getting enough sleep.
Reframing problem chronicity as resulting from complexity and that they will recover with treatment, vs. permanent problems	You've got a lot going on that can impact your recovery.
Reiterating that problems will recover	Most people with a concussion get better.

SCORE Manual Chapter 6, p. 6

Framing the problems and recovery course as unique allowed the team to present SCORE as a unique solution. Armed with a new understanding of the problem and a fresh approach to treatment, patients could set aside past treatment failures, earnestly commit to and follow through with the SCORE program, and develop greater self-efficacy for symptom management. By reframing the issues and



underscoring the expertise of the treatment team, the message communicated to patients echoed the old Home Depot tagline: “You can do it. We can help. ®”

**Ingredients for Representation motivation/self-efficacy (R(V)) targets from Bland et al (2016), with examples adapted for STAR-C:**

Ingredient	Examples
Reminding of personal goals selected	“Do you remember what your goals are (show folder)? Which one of those would you like to work on?”
Choosing from among previously stated goals	“You told me you wanted to get back to __, __, and __. Which of those should we focus on next?”
Asking about next goal	Would you like to choose another activity to help you with your goal of __? Or would you like to move on to a different goal?”
Adapting goals to meet patient’s current concerns	“It seems like with you feeling so badly today that something like entering data into your planner isn’t your top priority. What would you say is your number one priority today?”
Offering choice in activities related to goal	“For you to work effectively, you’ll probably need to __ (targets 1, 2, 3). Which of those sounds good to work on first?”
Allowing patient to choose activity	“What do you want to practice next, using the script or writing notes?”
Going along with what patient says	Patient: “I really want to get use a different planner” Therapist: “Ok, that sounds great!”
Discuss activities collaboratively	“From what you’ve said, one of the things you need to do for work is_(goal)_. As a step toward that, can we practice _(target)_ today?”
Explicitly link activity to goal	“Practicing your attention strategy is key to working in your typical environments, which is critical for your success at work.”
Clarifying or filling in as needed	Patient: “So we are going to talk about my disorganization today?” Therapist: “Yes, that’s the activity we came up with last time to get into the habit of checking your to-do list every morning.”
Aim for a challenge	“Great we will work on your strategy of asking people

	to slow down. Yesterday you did this once in a conversation with me and thought you got about half the information you needed. Let's aim for most of the information today, since that's what you said you'd need at work."
Remind patient of what they did in the previous session	"Yesterday you could get back on task once. Let's see if we can beat that today."
Ask the patient to choose activity challenge level that suits him/her	"Let's start off with a challenging activity. Which one of those activities we just discussed would you like to try first?"
Checking that the plan makes sense to the patient	"Before we get started, how does this sound to you?" "Does that all sound ok?" "Does that sound like a good plan?" "Does that all make sense?" "Are you on board with that plan?"
Ask the patient about effort level	"How difficult is this for you?" "How challenging was that for you?"
Link progress to goal <input type="checkbox"/> Progress may be in taking first steps, effort required, completing parts of task or whole task	"Taking your first steps today (achievement) is a huge accomplishment, and will help you achieve your goal of (patient goal)." "Yesterday that was a 4, today you said it was a 3 (effort/progress). It is getting easier for you to use this strategy, and you're getting closer to your goal of (patient goal)."
Ask for feedback on progress	"How did that go for you?" "How did you feel doing that?" "How do you think that went? What could have been done differently?" "What do you think about your progress on using this strategy?" "Was this activity similar to what you will be doing at home?" "What part of that activity was the most challenging?"
Follow up on patient feedback	"I know you said this was difficult. Do you feel like this is getting any easier with practice? We can make sure we work on this some more." "Since you said you're really worn out this afternoon, for tomorrow, would it help to schedule our sessions earlier in the day?"
Show progress using therapy tracker	

Therapist notes/observes a perceived barrier and asks patient for more information.	<p>"I can tell you are having difficulty (and it sounds like you do not want to continue with therapy). Can you help me understand why that is?"</p> <p>"You seemed pretty upset. How are you feeling?"</p>
Patient conveys emotional distress and therapist asks at least one follow-up question about it.	<p>Patient: "I just feel sort of low today."</p> <p>Therapist: "I'm sorry to hear that. What's going on?"</p>
Emotional distress conveyed/patient appears frustrated with activity and therapist acknowledges this (i.e., uses a reflection).	<p>"I can sense that you aren't feeling too interested in therapy right now."</p> <p>"It must be pretty tough to be off work for so long."</p> <p>"It sounds like you're worried that you might never get back to full-time."</p> <p>"It's no wonder you're feeling frustrated, learning to use these strategies for the first time is really hard."</p>

From Bland et al (2016):

Building on models from behavior change as well as rehabilitation research recommendations (Bandura, 1977; Rasmussen, Wrosch, Scheier, & Carver, 2006; Whyte & Hart, 2003), we developed Enhanced Medical Rehabilitation (EMR). EMR is a set of patient engagement skills that physical and occupational therapists can incorporate into their daily sessions (Lenze et al., 2013; Lenze et al., 2012). EMR focuses on an interactive patient-directed approach and frequent feedback to patients on their effort and progress, as well as achieving high intensity of therapy. EMR is patient-centered: personal goal setting, therapeutic connection, and patient autonomy are the foundation. Therapy is centered on the patient's individualized goals which are established through a Rehabilitation Goals Interview at the start of the course of treatment.

**Ingredients for Skill and Habit (S) targets from the RTSS Manual:**

Ingredient	Examples
Instructions (spoken, written, gesture, graphic)	Handout with written instructions
Cue (spoken, written, gesture, graphic, tactile)	Point to section of calendar to enter data
Prompt	"Let's get started"
Encouraging feedback	"You're working really hard at this."
Corrective feedback	"Looks like you did two lines rather than one at a time."
Evaluative feedback	"That was 80% correct."
Request for repetition	"Let's try that 5 times."
Modeling	"I'd do it this way" (then demonstrate)
Comparison to target (to increase skill)	"Let's compare how you just did to what you said you'd need for work."
Objects	Smart phone, smart pen, chart for tracking repetitions, mirror for feedback, timer/counter, readiness ruler handouts, ICF diagram
Opportunities for practice	Allocate 10 minutes of each session for repeated practice of using a strategy
Error-control methods	Spaced retrieval, vanishing cues
Imagery (to increase skill)	"How about mentally walking through the steps in this routine, so you can see yourself doing it at home?"

## Appendix 2. Why must there be a separate volition (R) target for homework?

The rule in the RTSS is to specify a volition target in any circumstance in which the clinician is unable to evaluate and directly modify the performance and outcome of the desired volitional behavior; that is, evaluation through personal verification and not, for example, only through the self-report of the patient.

Why do we raise volitional behavior to the level of a separate target in these cases, rather than simply require the specifier to use “extra ingredients” to ensure that the desired behavior takes place? Mostly, it is to acknowledge and emphasize that volition ingredients and those addressed to the direct target typically have *different mechanisms of action*. A home muscle strengthening program has ingredients that act upon the direct target such as the amount of resistance applied to the muscle, the number of repetitions and sets prescribed, and so on. The ingredients for the volition target, in contrast, are for motivating the patient to exercise, ensuring that they have enough time and space to do so, and perhaps helping him or her to set up a reminder system for cueing the activity. None of these latter ingredients has any action on the strength of the patient’s muscles; rather, their mechanisms of action have to do with the internal representations that will enhance the probability of engaging in the volitional activity and doing it correctly. Emphasizing these two targets, each associated with different mechanisms of action, increases the likelihood that issues of volition will be addressed in treatment design and delivery, and provides an opportunity to measure the impact of both sets of ingredients, separately, when assessing treatment outcomes.

SOURCE: RTSS Manual, p. 21

### Appendix 3. Goal Attainment Scaling (GAS) Instructions

#### What is GAS?

GAS is a way to quantitatively measure goal achievement and progress. GAS was originally used to measure mental health treatment outcomes in the 1980s (see review by Grant & Ponsford, 2014) and was initially applied to TBI rehabilitation by Malec (1999). It was recommended as a mechanism for collaborative goal setting in the 2016 VA/DoD Clinical Practice Guideline For The Management of Concussion, and the 2017 Clinician's Guide to Cognitive Rehabilitation in Mild Traumatic Brain Injury: Application for Military Service Members and Veterans; and was used in the SCORE trial.

Goals are rated on a continuum, developed collaboratively by the clinician and patient, patients are compared against their own previous performance. STAR-C uses GAS goals to develop measurable outcomes for targets.

- 1 Less than expected
- 0 Baseline - current status
- +1 Partially achieved
- +2 Expected
- +3 Better than expected

#### How do I scale STAR-C targets?

1. Construct targets using **SMART** principles:
  - a. **S**pecific
  - b. **M**easurable
  - c. **A**ttainable in the amount of time that client has in treatment
  - d. **R**ealistic for completion during engagement in treatment
  - e. **T**imely
2. For each target, first define where client is currently performing (0 on GAS scale)
3. After current performance spelled out, define expected level of outcome (+1 on scale)
4. After expected level of outcome spelled out, define -1 and +2 goals

#### Appendix 4. STAR-C Goal Attainment Scaling (GAS) Handout

My benchmarks for measuring my success in achieving my treatment targets are:

Less than expected:
Baseline - current status:
Partially achieved
Expected:
Better than expected:

## Appendix 5. Goal Attainment Scaling Examples

GAS Scale:

-1	Less than expected
0	Baseline - current status
+1	Partially achieved
+2	Expected
+3	Better than expected

Target: Picking up my notebook from my desk whenever I leave the desk for another task, to take it with me.

-1	I lost my notebook
0	I left my notebook on my desk and did not pick it up at all.
+1	I remembered to pick up my notebook when I put it down, about once per day
+2	I remembered to pick up my notebook most of the time when I put it down, which is good enough for work
+3	I remembered to pick up my notebook every single time I put it down, and never forgot to put it in my uniform pocket

Target: Verbally recapping main points of job instructions (to partner), to make sure I got them all.

-1	I did not use the strategy at all and tuned out when the person was talking
0	I did not use this strategy at all and tried to just remember the instructions
+1	I recapped main points once in a while but mostly missed the instructions
+2	I recapped main points of job instructions most of the time, which is what I need to keep my job
+3	I recapped main points of instructions and other conversations at work

Target: Taking three “thinking breaks” per day to reduce mental fatigue

-1	I worked extra hours without a break
0	I didn’t take any thinking breaks at work
+1	I took one thinking break yesterday
+2	I took three thinking breaks per day – in the a.m. and p.m. and at lunch – which was sufficient to maintain my performance levels
+3	I took a short thinking break any time I was mentally tired, even if it wasn’t on my schedule, to have optimal performance levels

Target: Using my “stay in the game” thinking strategy to stay focused on work tasks

-1	I didn’t try to stay focused on work tasks at all
0	I didn’t tell myself to “stay in the game” to stay focused on work tasks
+1	I used my “stay in the game” strategy once at work



+2	I told myself to “stay in the game” at the beginning of most of my important work tasks and said it to myself again when I felt myself losing focus, which is enough for me to get my job done
+3	I used my “stay in the game” strategy for most of my important tasks at work and also at home when I had a task where I needed to stay focused

## Clinician Copy

### Appendix 6. Session 1 Handout – Treatment Goal Worksheet

Complete this form after initial 3 problems are identified, to ensure problems occur frequently enough to provide opportunities for practice, are important to you, and are where you want to start in therapy. For each problem, enter a number based on the scale below. If you rate a problem 3 or less, please reflect on what it would take to get to a 5 for that problem, and if we need to choose a new problem. We will discuss this worksheet in the next session.

1	2	3	4	5
Not at all		Somewhat		Extremely

The three problems I have chosen to work on first are:	This problem occurs at least once per day.	It is important for me right now to work on this problem in therapy.	I am confident that I will succeed in therapy for this problem.	I am ready to start using strategies we identify in therapy to address this problem in my everyday life.	I am satisfied that addressing this problem should be a goal in therapy.

## Appendix 7. General procedure for specification.

### General procedure:

- Identify aspects of function that need to change to achieve goal. One aspect of function = one target.
- Categorize each aspect of function into one of three target groups: Organ functions (O), Skills and Habits (S), or Representations (R).
- Determine if any target requires a separate R target for Volition
  - Note that home practice or homework must have a separate Volition target (see Appendix 2 for information about homework targets).
- Specify ingredients for each target.
- Specify dose of ingredients for each target.
- Specify outcome measure for each target.

## Appendix 8. Specification examples.

### Example 1: Patient complains that she can't read medium-length text, which she needs to do for work.

- Identify aspects of function that need to change to achieve goal
- Categorize aspects of function into three target groups: Organ functions, Skills and Habits, Representations
  - Knowledge about strategies = R
  - Use of a strategy for reading = S
- Determine if there will be home practice that requires a volition target
  - Increased habit of using strategy, via home practice = R (V)
- Specify ingredients for each target (see table)
- Specify dose of ingredients for each target (see table)
- Specify outcome measure for each target (see table)

Target	Ingredients	Dose	Outcome measure
Increased knowledge about reading strategy (R)	<input type="checkbox"/> Explanation of strategy of covering up part of text with a sheet of paper and using that sheet of paper to take notes on text content <input type="checkbox"/> Modeling strategy <input type="checkbox"/> Sample medium-length text for illustration <input type="checkbox"/> Paper to fold to cover part of page <input type="checkbox"/> Strategy modifications as needed per patient feedback	As needed	<input type="checkbox"/> % of main points of strategy stated correctly in teach-back <input type="checkbox"/> Patient description of how the strategy would work in real-life environment
Increased accuracy in use of moving-paper strategy for identifying main ideas in written text (S)	<input type="checkbox"/> Instructions on strategy use and outcome assessment (number of main ideas written down in notes) <input type="checkbox"/> Modeling strategy <input type="checkbox"/> Paper to fold to cover part of page <input type="checkbox"/> Strategy modifications as needed per patient performance <input type="checkbox"/> Feedback on accuracy of strategy use and accuracy of main ideas	As needed, except for practice = X 5	<input type="checkbox"/> % of main ideas accurately highlighted in text

	<input type="checkbox"/> 5 medium-length texts for practice <input type="checkbox"/> Normalizing feedback (e.g., college students often use this method) <input type="checkbox"/> Provide opportunities for practice <input type="checkbox"/> Encouraging feedback		
Increased likelihood of using strategy via home practice (homework) (R(V))	<input type="checkbox"/> Self-selected practice schedule <input type="checkbox"/> Self-identification of potential barriers and solutions <input type="checkbox"/> Self-prediction of likelihood of practice	Once per session	At next session: <input type="checkbox"/> % of predicted practice achieved <input type="checkbox"/> % accuracy for main ideas written down in notes on novel medium-length text

**Example 2. Patient complains of problems focusing on work in a busy work environment, and reports that he is not confident he can improve this situation.**

Target	Ingredients	Dose	Outcome measure
Increased knowledge about sources of distractions at work and how to reduce them (R)	<input type="checkbox"/> Verbal explanation with pictures of workplaces as needed <input type="checkbox"/> Coaching to identify sources of personal distraction and how to minimize them (could be external, e.g., earbuds for loud office, removing clutter on work surface; or internal distractions, e.g., eating when hungry, taking a break when tired)	<input type="checkbox"/> As needed	<input type="checkbox"/> % accuracy in identifying workplace distractions in randomly selected office at site
Increased ability to set up workspace to have minimal distractions (S)	<input type="checkbox"/> Selection of a strategy that patient rates as important and achievable <input type="checkbox"/> Modeling correct performance <input type="checkbox"/> Opportunities for practice <input type="checkbox"/> Interval practice schedule <input type="checkbox"/> Positive feedback on	<input type="checkbox"/> As needed	<input type="checkbox"/> % of opportunities in which patient modifies workspace to meet his needs, in randomly selected offices, with no cueing by clinician

	correct performance <input type="checkbox"/> Cues to correct performance		
Increased self-efficacy to modify work environment (R(V))	<input type="checkbox"/> Self-prediction and self-rating form <input type="checkbox"/> Instructions <input type="checkbox"/> Feedback	<input type="checkbox"/> Once per session	<input type="checkbox"/> Self-efficacy ratings of 5 on Readiness Ruler
Increased skill in using strategy via home practice (homework) (S)	<input type="checkbox"/> Instructions about homework <input type="checkbox"/> Data tracking form for homework <input type="checkbox"/> Opportunities to practice strategy as it will be used at home <input type="checkbox"/> Corrective feedback	<input type="checkbox"/> Once per session <input type="checkbox"/> Once per session <input type="checkbox"/> Repeated trials until independent <input type="checkbox"/> Each trial	<input type="checkbox"/> % of opportunities workplace modified as needed by patient (per patient report the following session)
Motivation to practice strategy at home (R(V))	<input type="checkbox"/> Behavioral contract <input type="checkbox"/> Talk through how it would look at home (e.g., # of practice opportunities), what could happen <input type="checkbox"/> Ask patient about potential barriers to homework completion and to generate strategies to address barriers <input type="checkbox"/> Information about importance of homework completion to achieving effective treatment dose <input type="checkbox"/> Form for self-assessment of likelihood of completing homework <input type="checkbox"/> Framing as “you can do it, we can help” <input type="checkbox"/> Encouragement	<input type="checkbox"/> Once each session, after homework is assigned	<input type="checkbox"/> Self-assessment score of 5 (likelihood of completing homework)

**Example 3: Patient reports problems getting things done in everyday life.**

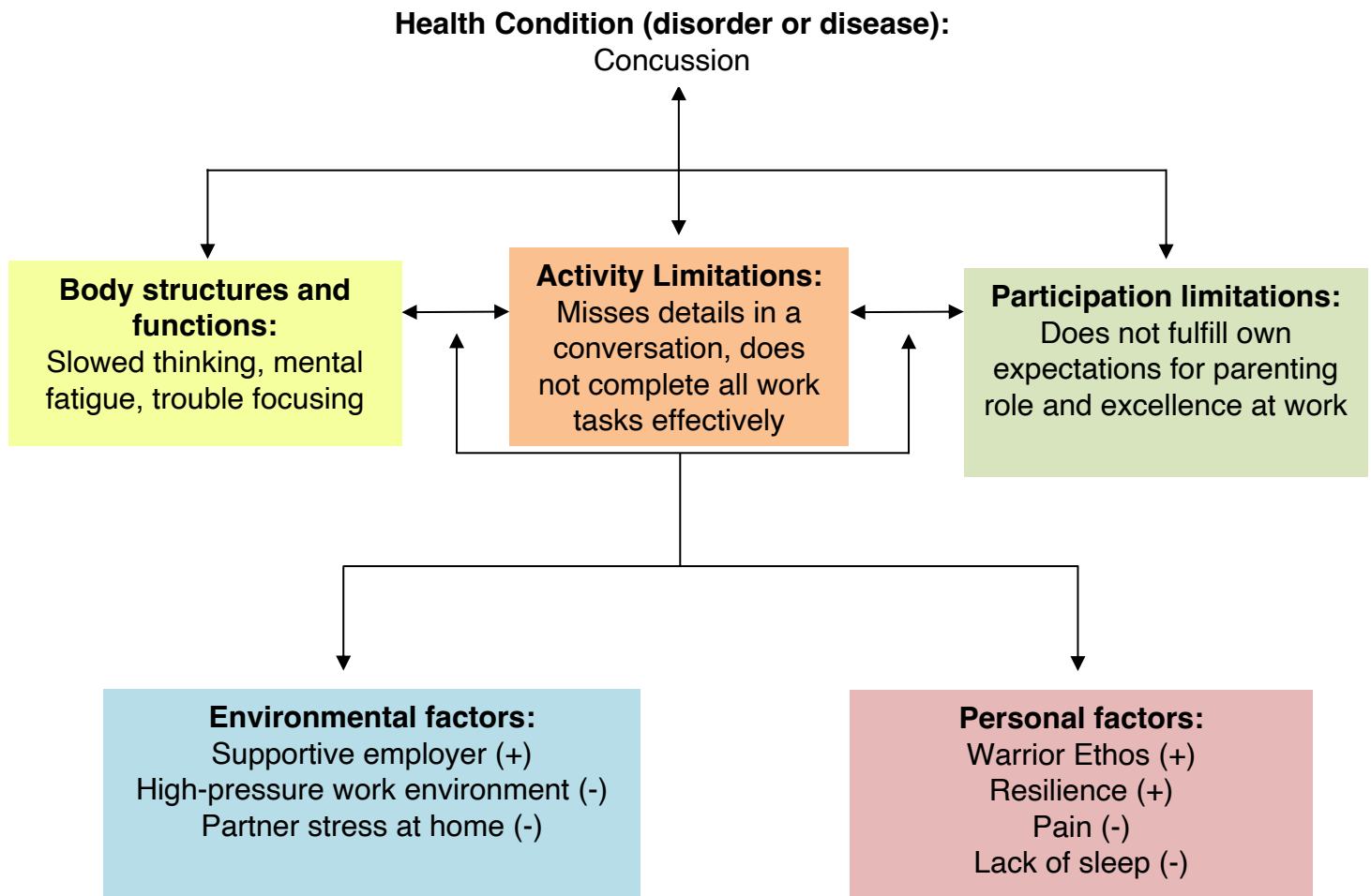
SOURCE: Dawson, Hunt & Douglas. *COOP: Treatment for Managing Dysexecutive Function*. Rotman Research Institute, Toronto. September 2013.

Target	Ingredients	Dose	Outcome Measure
Increased knowledge of planning strategy: <b>Goal, Plan, Do, Check (R)</b>	<input type="checkbox"/> Spoken information about strategy with examples <input type="checkbox"/> Cue cards illustrating strategy <input type="checkbox"/> Prompting of oral rehearsal of strategy	<input type="checkbox"/> As needed	<input type="checkbox"/> % of main strategy ideas recalled in teach-back
Increased independent use of GPDC strategy in simulated everyday planning (S)	<input type="checkbox"/> Opportunities to practice in session <input type="checkbox"/> Step-by-step prompting to practice strategy in carrying out everyday tasks in-session <input type="checkbox"/> Patient co-develops simulated tasks to resemble those at home <input type="checkbox"/> Praise and reinforcement of successful strategy use <input type="checkbox"/> Praise and reinforcement when new goals are identified <input type="checkbox"/> Encouragement to check plan after performing it <input type="checkbox"/> Guided discovery (i.e., non-directive coaching) to analyze results and adjust plan	<input type="checkbox"/> As needed except for opportunities to practice: minimum of 5 with varied problems	<input type="checkbox"/> % of opportunities strategy is used correctly
Increase motivation for using GPDC in everyday life (R(V))	<input type="checkbox"/> End-of-session oral summary of session target and outcome <input type="checkbox"/> Prompting to predict how and when strategy will be used outside of therapy <input type="checkbox"/> Blue sheets for patient to write steps of goals and results of plans outside of sessions <input type="checkbox"/> Prompting to self-evaluate overall success since beginning of program <input type="checkbox"/> Feedback on how patient has done in program overall	<input type="checkbox"/> As needed, and at minimum once at the end of each session	At next session: <input type="checkbox"/> % of predicted practice achieved <input type="checkbox"/> Self-ratings of self-efficacy for implementing practice

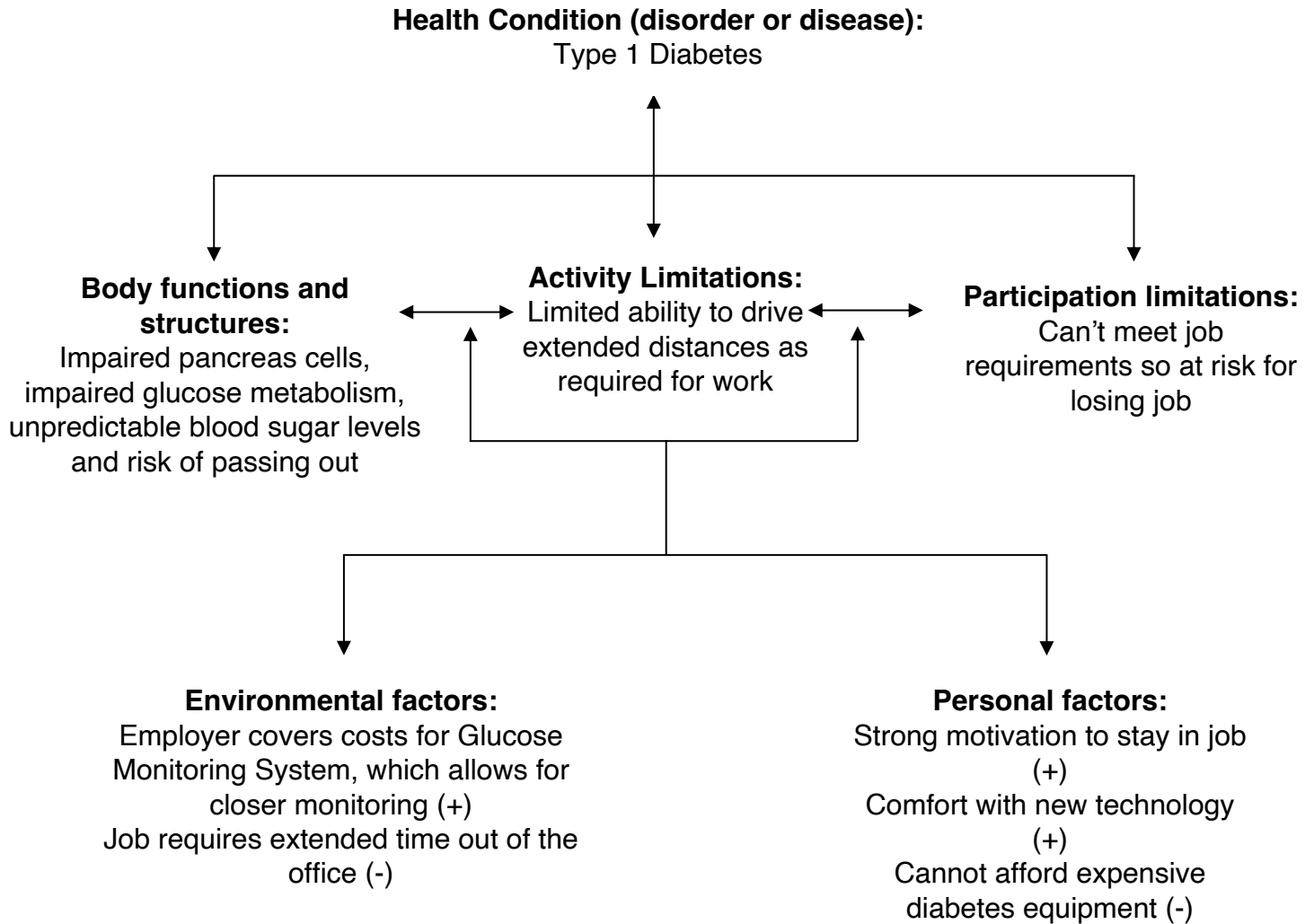
	<input type="checkbox"/> Oral information about the importance of repetition and practice <input type="checkbox"/> Use of “enabling principles” to promote independence		
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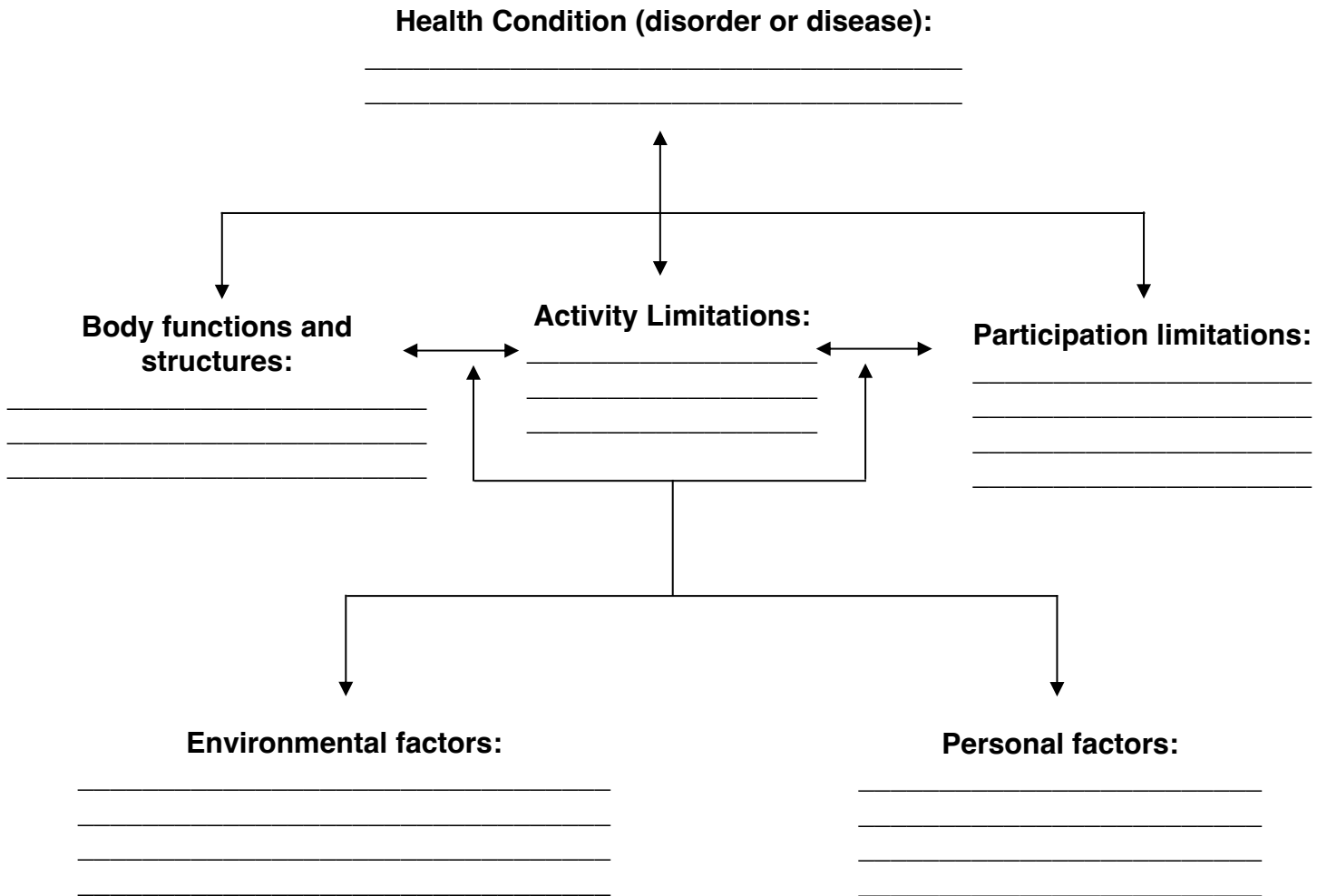
Appendix 9. Handout with International Classification of Functioning Disability and Health (ICF)  
Worked Examples



Appendix 9. Handout with International Classification of Functioning Disability and Health (ICF)  
Worked Examples



Appendix 10. Handout with International Classification of Functioning Disability and Health (ICF)  
Blank for Patient Use



## Appendix 11. Glossary

Term/Acronym	Definition
Aims	Aspect(s) of the patient's or other recipient's functioning or modifiable personal factors that may or may not change indirectly (via mechanisms specified in enablement theory) as a result of the treatment-induced change in the treatment target or in multiple treatment targets. See <i>enablement theory</i> . A single treatment may have multiple aims, and there may be a chain of treatment aims - e.g., increased strength (target) leading to improved ambulation (aim 1) leading to greater community participation (aim 2). In the case of treatments delivered to other recipients, at least one aim is some aspect of the patient's functioning. Although relevant to the ultimate clinical value of a treatment, treatment aims are not relevant to the specification of the treatment, and are therefore not specified in the RTSS.
Devices	Devices are a subcategory of ingredients that include prostheses, orthoses, and assistive devices, either devised in therapy or off-the-shelf, such as cell phones. Some devices (e.g., positioning aids) can achieve their purpose passively, in which instances the device is considered to have a <i>treatment target of its own</i> , in the Organ Functions group. More commonly, however, a patient must develop the skill of using a device during relevant tasks; in these instances, the device's therapeutic attributes are defined to be <i>ingredients</i> directed toward a Skills and Habits or Representations target. In either case, the ingredients should be defined in terms of the <i>theoretically relevant attributes of the device</i> rather than the device itself.
Direct Target	Change in the specific aspect of functioning which is predicted to result from performance of the treatment activity by the clinician (non-volitional treatments) or the treatment recipient (volitional treatments). The direct target for volitional treatments may be accompanied by a separately specified volition target (see entry) in cases where clinicians are unable to directly verify the performance of the behavior needed to convey the active ingredients for the direct target.
Dosing parameters	Quantitative variations in ingredients, such as numbers of repetitions, intensity of practice, setting on device that delivers energy to tissues, criterion for success for progression and slope of progression in treatment, schedules of practice or reinforcement.
Goal Attainment Scaling (GAS)	GAS is a way to quantitatively measure goal achievement and progress. Goals are rated on a continuum, developed collaboratively by the clinician and patient, patients are compared against their own previous performance. STAR-C uses GAS goals to develop measurable outcomes for targets.
Habit	A behavioral routine that is repeated regularly and, after acquisition, tends to occur automatically in the presence of certain stimuli. Habits are important considerations for rehabilitation because the long-term goals of rehabilitation often entail patients' acting habitually in new, adaptive ways to sustain or continue improvements in functioning. Habits are included as targets in the Skills and Habits group because habit formation responds to many of the same active ingredients as skill learning.

Ingredients	Observable (and, therefore, in principle, measurable) actions, words, hands-on manipulation, common objects, chemicals, devices, or forms of energy that are selected/delivered by the clinician to a treatment recipient and are hypothesized by the clinician to exert an effect.
Mechanism of action	Process by which a treatment's active ingredients induce change in the target of treatment. Unlike ingredients and targets, mechanisms of action are frequently not observable – especially for “internal” targets like changes in attitudes or knowledge – and must be inferred by the effects of ingredients on targets.
Progression	The clinician's deliberate, systematic alteration of treatment ingredient(s) to maintain, over time, the degree of challenge to the body system/ behavior(s) selected for change. The next highest level in a progression is often triggered by improvements in the target of treatment; therefore, the pace of progression (within a single treatment contact or over a course of treatment) typically depends on the pace of change in the treatment target. The form that treatment progression takes (and hence the nature of the challenge that is being maintained) is often specified by the treatment theory.
Quick Win	A target the clinician expects to be able to reach in a single session. A Quick Win provides opportunity to use early success to gain momentum towards change. Example Quick-Win targets in SCORE included learning to set phone alarms for tasks and learning to use self-talk to go through steps.
Rehabilitation Treatment Specification System (RTSS)	Conceptual framework that can be used to specify any rehabilitation treatment, by connecting the actions of the clinician (ingredients) with the changes produced in the patient or other recipient of treatment.
Representations treatment group	Treatments aimed at changing internal (i.e., central nervous system) representations related to cognitions, affect, motivation, and intentions to perform volitional behaviors. Cognitions are referred to here as thoughts and ideas, whereas affect is used as a shorthand term to encompass both automatic and more reflective aspects of emotional experience and response. Motivation involves the propensity to act, and intentions represent plans to act. Since mental representations underlie intentions to act, volition targets are a sub-group of Representations group targets.
Skills and Habits treatment group	Treatments that have in common learning or improving performance of a skill via practicing that skill, or reducing the effort required/ increasing the habitual nature of a behavioral routine. The target may be a Body Function from the <i>International Classification of Disability, Functioning and Health</i> , an activity, or a habit.
Specification of a treatment	Articulation of the specific ingredients/ dosing parameters delivered by a clinician to achieve a specific target via associated mechanism(s) of action, according to a treatment theory explaining or hypothesizing the links from ingredients to target, i.e., how the desired change will take place.
Treatment group	Broad class of treatments that are mutually exclusive with respect to treatment targets and mechanisms of action. See Skills and Habits treatment group and Representations treatment group.
Treatment recipient	Individual whose function/behavior is intended to be changed directly as a result of treatment. In most cases this is the person with a disability (patient/client), but in some instances another person (caregiver, employer) may be the

	recipient who is changed by the intervention (e.g., taught to provide care or to create a more supportive environment for the patient/client). Enablement theory may be used to postulate distal effects (aims) that improve the patient's/client's functioning.
Treatment target	Specific, measurable (in principle) aspect of the recipient's functioning or personal factor that is predicted in the treatment theory to be directly changed by the treatment's mechanism of action. A single target plus the treatment ingredients hypothesized to achieve it constitute a treatment component. Change in a target causally precedes any aims that may be achieved as a result.
Volition	Volition may be roughly equated with <i>effort</i> expended by the treatment recipient. Some Organ Functions treatments—physical exercise being a prime example—and <i>all</i> Skills and Habits and Representations treatments require volition.
Volition target	A target in the Representations group that is expressed as a specific volitional behavior assigned by a clinician. Volition targets may stand alone or be paired with direct targets, in cases where the clinician cannot directly verify the occurrence/ accuracy of the recipient's action: e.g., in the case of a home program, homework assignment, certain forms of telerehabilitation. In such cases, a volition target must be enacted by the treatment recipient in order for the ingredients for the direct target to be implemented.

1	2	3	4	5
Not at all		Somewhat		Extremely