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Commentary

Inpatient Cognitive Rehabilitation: Is It Time for a Change?

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AS LENGTHS OF STAY become shorter and patients enter and leave inpatient traumatic brain injury (TBI) rehabilitation at a more acute stage in recovery, it might be time to consider whether our approach to inpatient cognitive rehabilitation is meeting patients' needs. In particular, we might ask whether didactic cognitive remediation is appropriate at the early stage postinjury and whether there are other ways to prepare patients with cognitive impairments and their families for challenges they will face after discharge. The following commentary considers the traditional model of cognitive remediation within the context of changes in inpatient hospitalization over the past several years, and proposes an alternative model that focuses on giving patients tools to cope with their post–hospital experience.

A HISTORICAL PERSPECTIVE ON INPATIENT COGNITIVE REHABILITATION

Inpatient brain injury rehabilitation has changed drastically in the past 10 or 15 years. In the 1980s and early 1990s, patients with acquired cognitive impairments typically were transferred to inpatient rehabilitation when they had recovered enough to engage in therapies in a meaningful way. In some cases, children and adults who were not ready for rehabilitation but no longer needed hospital-level care were transferred to "step-down units," nursing homes, or even home until they were ready to return for inpatient treatment. Once admitted, patients with cognitive impairments might stay on a rehabilitation unit for weeks or months, receiving individual and group cognitive therapies, delivered primarily by occupational therapists (OTs) and speech-language pathologists (SLPs). When possible, OTs and SLPs incorporated activities such as community outings, with the aim of helping patients generalize cognitive gains from therapy into community life. Therapists, along with discharge planners, liaised with community resources such as teachers or vocational rehabilitation providers so that cognitive supports and services would be in place to prepare for the patient's discharge from hospital.

Early cognitive rehabilitation was guided by a medical model: therapists tested patients' cognitive functions, and once we identified impairments, we treated them using activities and materials designed to "rebuild" cognitive function from the ground up. Following the classic model proposed by Ben-Yishay and Diller,[1] cognitive rehabilitation began with the most basic cognitive functions, such as orientation, and progressed sequentially to complex "higher-order" cognitive functions such as logical reasoning. If the patient was only partway up the hierarchy of cognitive complexity when he or she was discharged, discharge materials included a "cognitive home program," typically containing worksheets and other cognitive exercises to be completed by patients under the supervision of their families. Therapists often had time to train family members in implementation of the home program and to monitor or at least check on patients' progress on an outpatient basis.

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*The terms "patient" and "family" are used here in the broadest sense of individuals receiving care or treatment and stakeholders in their outcome.

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THE CURRENT INPATIENT REHABILITATION CONTEXT

In 2012, the average length of stay in inpatient TBI rehabilitation in the United States was 18 days. Compared with the 1980s and 1990s, patients with acquired brain injury are sicker when they are admitted to inpatient rehabilitation and sicker when they leave. While community awareness about brain injury has improved considerably over the past 20 years, community services remain inaccessible for many patients, particularly those in rural areas. Even in areas where resources are available, many patients have limited or no insurance coverage for outpatient cognitive rehabilitation from OTs or SLPs. In some states in the United States (the author's included), referrals for any service that includes the words "cognitive rehabilitation" is almost guaranteed to be denied. Vendors of "brain aerobic" programs have rushed to fill this gap: patients and families are now able to purchase a wide variety of products and services that aim to "retrain" their brains, sometimes at a considerable expense.

It is clear that the length and acuity of inpatient cognitive rehabilitation have changed. The content, however, is often still a version of the medical model, designed to remediate cognitive functions through a hierarchy of exercises. Cognitive rehabilitation often involves didactic worksheets and activities that allow OTs and SLPs to quantify progress for third-party payers. The focus on impairment-based activities may be encouraged by electronic record keeping, which, in many settings, has reduced intervention to a series of checklists of cognitive benchmarks ("follows 2-step commands," "can remember 3 of 3 items after a delay"). Patients and their families may traverse the entire inpatient program without even beginning to appreciate the patient's deficits, the trajectory of spontaneous recovery, and the myriad needs they will have after discharge.

AN ALTERNATIVE MODEL OF INPATIENT COGNITIVE REHABILITATION

The question posed in this commentary is whether the model for delivering inpatient cognitive rehabilitation is the best fit for a 17-day inpatient rehabilitation stay. In the ideal world, patients would come to cognitive rehabilitation when they are fully prepared to participate in it and when basic research and sound clinical judgment suggest that it would be most effective. As cognitive and sensorimotor functions have different recovery trajectories, therapies might be phased in and out over time, with a focus on sensorimotor function early in rehabilitation and cognitive rehabilitation later in recovery.

The ideal world just described might not be possible at present–particularly phased scheduling, which presents significant logistical challenges–but there might be some ways in which inpatient cognitive rehabilitation could be improved. As a starting point, we might reconsider the overall goals of cognitive rehabilitation in the first few days or weeks postinjury. In a rehabilitation environment characterized by acutely sick patients, short stays, and few post–acute care resources, rather than attempting to remediate cognitive function through direct treatment of impaired functions, inpatient cognitive rehabilitation might have the following goals:

1. *Establish a therapeutic alliance with patients and families, so they identify OTs and SLPs as an ongoing resource as needs arise postdischarge.* The notion of a therapeutic or "working" alliance dates from the psychoanalytic literature of the 1960s and 1970s.[2] It refers to the collaborative aspect of therapy, or the extent to which the patient and therapist work together to achieve the patient's goals. The concept has been discussed in the TBI literature primarily in the context of setting patient-centered therapy goals and improving treatment adherence.[3,4] In a system with short lengths of stay, however, perhaps as important is developing the type of relationship with patients and families that would encourage them to ask analogous professionals in the community for help with cognitive problems that arise in the future. Cognition is not something most people think about in everyday life, at least not in the way it is operationalized in rehabilitation, and cognitive problems can be difficult to articulate and stigmatizing for patients and families. Perhaps one outcome of inpatient cognitive rehabilitation is that families not only understand something about what we do but also trust us–and people like us–to be a resource in the future.

   In addition to the "who" of cognitive rehabilitation, it might help to give families more formal information about the "what." One consequence of short stays is that patients are discharged very early in their recovery process so that goals set in rehabilitation may be irrelevant even a few days after discharge. As a result, it can be difficult for families to know what to ask for when seeking outpatient services, which is particularly important when there are no formal qualifications to be a cognitive rehabilitation provider. One way to address the mismatch between in- and outpatient settings is to provide families with a written "roadmap" of goals and expectations, to help them advocate for appropriate services in the future. Goal maps can be created using the framework of the International Classification of Functioning, Disability, and Health[5] so that treatment planning begins with the patient's desired outcome (eg, "return to school") and works backward (return to school <listening to a lecture and taking notes <writing a summary of a written paragraph <writing single words = what we are doing in therapy today). In this way, the patient, family, and clinician are all on the same team, treatment activities have transparent face validity and explicit connections to the patient's long-term goals, and the patient has a concrete notion of steps to achieve those goals that can be carried into the next stage of intervention and recovery. The process of developing a goal map can be a goal in itself, quantified in a treatment plan (eg, "Interviewed family to identify patient's preinjury interest and abilities for setting long-term goals" or "Developed a patient-centered goal map"). The plan is expected to be modified as the patient recovers and his or her strengths and challenges become more apparent. The aim is not to create a binding plan but rather to build a collaborative relationship that will carry the patient into the next stage of recovery.

2. *Help patients and families observe and understand the natural history of cognitive recovery after brain injury to help them interpret behaviors they are seeing each day and appreciate their family member's progress.* As Holland and Fridriksson[6] observed in their argument for a counseling-based approached to acute intervention after stroke, most people have little knowledge about cognitive functions or brain damage before it happens to them and are mostly worried about whether the patient's mind is going to be okay. Giving the family concrete examples to show how the patient's cognitive function is recovering can provide both psychosocial support and insights into the recovery process. Such activities might include teaching families how to track specific behaviors as they improve over time, such as counting the number of minutes a patient is able to sustain attention from one day to the next or the number of words he or she can produce on a fluency task. In an early study by Sohlberg and colleagues,[7] the simple act of tracking behaviors decreased family members' stress and frustration with those behaviors and increased caregivers' use of support behaviors. It can also provide families with a framework for tools they will learn to use in the future, when they may be the patient's primary cognitive supports. Again, activities such as tracking spontaneous cognitive recovery can easily be translated into treatment goals, as family training ("Spouse will demonstrate accurate use of tracking chart to record patient's use of whiteboard to check date") and also as an indicator of the family's awareness of the patient's limitations and needs ("Patient's father will identify time of day at which patient is most alert").
3. *Provide patients and families with some tools to help manage the everyday consequences of the patient's cognitive impairments at home.* In the first few weeks postinjury, family members often are overwhelmed and stressed, particularly as the time for discharge approaches. Thus, for many people, acute care rehabilitation may not be the optimal time for formal training in the use of strategies to manage cognitive problems at home. Nevertheless, as many patients will not receive any cognitive rehabilitation services after discharge, there are good reasons to attempt to train families in the use of 1 or 2 simple strategies that can help minimize the burden of cognitive impairments. An SLP might, for example, train family members in the use of a single conversation strategy that minimizes the demands on declarative memory, such as talking about personally relevant, well-known events in the past; providing background information before making a statement, rather than quizzing the patient (an approach one team refers to as "Don't ask, just tell"); or discussing opinions or advice. Family training is a measurable goal (eg, counting the number of times a family member uses a specific strategy in a 5-minute conversation) and may be the most appropriate use of therapy time in the early-stage postinjury.
4. *Minimize bad habits that can develop during the early days postinjury when patients have normal implicit learning of habits but impaired declarative memory and reasoning.* Research on implicit learning and memory has had a profound impact on rehabilitation. Unlike explicit (declarative) memory, implicit memory is adultlike from early childhood[8] and seems impervious to almost any form of brain damage. Most important for TBI rehabilitation, it is preserved during posttraumatic amnesia[9] and in patients with chronic, profound declarative memory impairments.[10] Implicit learning underlies most of our learning of habits and procedures and is probabilistic in nature–that is, we learn what we practice the most, regardless of our explicit experience of the learning event.[11] When patients have impaired declarative learning, implicit learning has free rein, which means that patients are learning whatever they do the most: repetitive questions to staff, socially inappropriate behavior, saying "I don't know" when someone asks them the date, disclosing personal information to strangers (eg, hospital staff).

   Inpatient rehabilitation presents an opportunity for careful observation of patient behavior to identify potential habits that can be major problems after discharge. Observation should be done by all team members, including physical therapists and nursing staff, and should include both identification of triggers of problem behaviors (eg, if a patient has an outburst after being asked many questions to which he or she has no answer) and also opportunities to reinforce positive habits. The observation process will reveal what the patient is actually learning during his or her inpatient stay, which can guide rehabilitation and help anticipate challenging behaviors postdischarge.

5. *Help patients and families be advocates for their own needs postdischarge and educated consumers of cognition-related resources.* It is common to provide family members with education in the form of handouts or online resources about TBI and its consequences. Given the acuity of injury at the time of discharge for many patients, however, it might also be helpful to provide specific materials for advocacy. For example, Lash and Cluett[12] developed a series of specific advocacy strategies for parents of children with brain injury, such as creating a short description of their injured family member's main strengths and needed supports (eg, "Jake has some memory problems. He needs you to write things down."). Developing this type of script for families or for patients themselves (who can learn it using implicit learning strategies) can be a valuable use of therapy time, and both developing and using the script can be stated as treatment goals. It might also be useful to provide families with formal instructions to help them be better consumers of services, such as a handout on how (or if) they should purchase commercial materials for cognitive stimulation, given the likelihood that they will be seeking resources once the patient has returned home.

LIMITATIONS OF THE PROPOSED MODEL

There are several potential critiques of the suggestions presented in the preceding sections, and a few of these will be considered here. First, it might be argued that this model is already in use in most clinical settings. Counseling, education, building rapport, supporting positive behaviors, and documenting spontaneous recovery: these are all elements of conventional intervention approaches used in inpatient cognitive rehabilitation (as well as in other types of acute care rehabilitation). Indeed, the ideas presented here might be best described as a shift in emphasis of inpatient cognitive rehabilitation rather than a true change in the model of service delivery, with more focus on preparation for the future and less on didactic cognitive remediation.

Another critique is that there is a lack of data to support the ideas proposed here. To the author's knowledge, only 2 studies have considered specific didactic therapy methods in acute care cognitive rehabilitation,[13,14] Neither found any advantage for one method of cognitive retraining over another, but neither considered the framework proposed in this Commentary. Other studies have included didactic cognitive rehabilitation as part of a multicomponent, multidisciplinary intervention,[15,16] but, in this type of model, it is difficult to determine which elements of the intervention accounted for treatment benefits.

Related data from other populations may inform decisions about the structure of inpatient cognitive rehabilitation. For example, there is a growing body of animal literature on the risks of intensive intervention in the very acute stages postinjury (see the review by Kleim and Jones[17]). This research is still in the early stage, however, and it is not yet clear how it will translate into human rehabilitation. Even if empirical studies are conducted, it may always be the case that factors such as relationships with therapists and the extent to which team members use patient-centered goal setting, while critical for intervention outcomes, will be difficult to quantify (or standardize) and thus might not be revealed. Ultimately, one's choice of intervention framework is likely to be driven by a combination of logic and reason, theoretical principles, available direct evidence, studies in related fields, and experience, which are all sources of "evidence" in evidence-based practice.[18]

CONCLUSION

The suggestions in this Commentary are not original but rather reflect a convergence of ideas from several sources: current trends in aphasia therapy, advocacy by the disability rights community, changes in thinking about outcome measurement, our growing understanding about appropriate instructional methods for patients with declarative memory impairments, studies showing limited benefit from didactic impairment-based cognitive rehabilitation for outcomes beyond the clinic, and the harsh realities of limitations in healthcare delivery and reimbursement. The ideas stated here also evolved through comments to the author from a variety of stakeholders in the TBI community, most notably patients, families, OTs, SLPs, and community service providers such as vocational rehabilitation therapists and case managers. Taken together, information from these sources suggests that it might be time for a shift in the focus of inpatient cognitive rehabilitation, from remediating cognitive deficits to preparing patients and their families for the challenges associated with TBI as a chronic disease.

REFERENCES

1. Ben-Yishay Y, Diller L. Rehabilitation of cognitive and perceptual defects in people with traumatic brain damage. *Int J Rehabil Res.* 1981;4(2):208–210.
2. Curtis HC. The concept of therapeutic alliance: implications for the "widening scope." *J Am Psychoanal Assoc.* 1979;27(suppl):159–192.
3. Sohlberg MM, McLaughlin KA, Todis B, Larsen J, Glang A. What does it take to collaborate with families affected by brain injury? A preliminary model. *J Head Trauma Rehabil.* 2001;16(5):498–511.
4. Schonberger M, Humle F, Teasdale TW. The development of the therapeutic working alliance, patients' awareness and their compliance during the process of brain injury rehabilitation. *Brain Inj.* 2006;20(4):445–454.
5. World Health Organization. *International Classification of Functioning, Disability and Health. Report.* Geneva, Switzerland: World Health Organization; 2001.
6. Holland AL, Fridriksson J. Aphasia management during the early phases of recovery following stroke. *Am J Speech-Lang Pathol.* 2001;10(1):19–28.
7. Sohlberg MM, Glang A, Todis B. Improvement during baseline: three case studies encouraging collaborative research when evaluating caregiver training. *Brain Inj.* 1998;12(4):333–346.
8. Hömberg V, Bickmann U, Müller K. Ontogeny is different for explicit and implicit memory in humans. *Neurosci Lett.* 1993;150:187–190.
9. Ewert J, Levin HS, Watson MG, Kalisky Z. Procedural memory during posttraumatic amnesia in survivors of severe closed head injury. *Arch Neurol.* 1989;46:911–916.
10. Cohen NJ, Squire LR. Preserved learning and retention of pattern-analyzing skill in amnesia: dissociation of knowing how and knowing that. *Science.* 1980;210(4466):207–210.
11. Cohen NJ, Eichenbaum H, Deacedo BS, Corkin S. Different memory systems underlying acquisition of procedural and declarative knowledge. *Ann N Y Acad Sci.* 1985;444:54–71.
12. Lash M, Cluett B. *Parents and Educators as Partners: A Workbook on Helping Your Child After Brain Injury.* Youngsville, NC: Lash & Associates; 2008.
13. Ponsford JL, Kinsella G. Evaluation of a remedial programme for attentional deficits following closed-head injury. *J Clin Exp Neuropsychol.* 1988;10(6):693–708.
14. Novack TA, Caldwell SG, Duke LW, Bergquist TF, Gage RJ. Focused versus unstructured intervention for attention deficits after traumatic brain injury. *J Head Trauma Rehabil.* 1996;11(3):52–60.
15. Niemeier JP, Kreutzer JS, Marwitz JH, Gary KW, Ketchum JM. Efficacy of a brief acute neurobehavioural intervention following traumatic brain injury: a preliminary investigation. *Brain Inj.* 2011;25(7/8):680–690.
16. Vanderploeg RD, Schwab K, Walker WC, et al. Rehabilitation of traumatic brain injury in active duty military personnel and veterans: Defense and Veterans Brain Injury Center randomized controlled trial of two rehabilitation approaches. *Arch Phys Med Rehabil.* 2008;89(12):2227–2238.
17. Kleim JA, Jones TA. Principles of experience-dependent neural plasticity: implications for rehabilitation after brain damage. *J Speech Lang Hearing Res.* 2008;51(1):S225–S239.
18. Montgomery E, Turkstra LS. Evidence-based medicine: let's be reasonable. *J Med Speech Lang Pathol.* 2003;11(2):ix–xii.