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Templated Interdisciplinary Rehabilitation Care Plan Documentation for Veterans With Traumatic Brain Injury

Joel Scholten, MD, Ellen Danford, BA, Azadeh Leland, DScPT, Heather Malecki, DPT, Douglas Bidelspach, MPT, Brent Taylor, PhD, MPH, and Nina Sayer, PhD, LP

ABSTRACT

Purpose of Study: Individualized interdisciplinary care is the hallmark for rehabilitation following traumatic brain injury (TBI). Veterans Health Administration (VHA) utilizes an electronic note template to document Interdisciplinary Rehabilitation and Community Reintegration (IRCR) care plans for Veterans with TBI requiring rehabilitation. All Veterans with a TBI diagnosis, receiving skilled therapy for TBI-related issues, and followed by a case manager must receive a care plan. The purpose of this study was to determine the level of compliance with the IRCR care plan requirements used to identify Veterans with TBI in need of the care plan and to evaluate the reasons for inconsistent compliance. In addition, the study sought to provide a more objective assessment of Veterans with TBI requiring an IRCR to assist in establishing a target metric.

Primary Practice Setting: TBI outpatient clinics.

Methodology and Sample: Investigators conducted a retrospective medical record review of 546 Veterans with a TBI diagnosis seen at the Washington, DC VA Medical Center's outpatient polytrauma clinics in 2013. Cases were initially reviewed for referral or engagement with skilled therapy. Charts where Veterans were referred or engaged with skilled therapy were forwarded to 2 polytrauma clinicians to determine whether therapy was requested to treat a TBI-related condition. Finally, charts were reviewed for case management and analyzed for algorithm compliance. Analysis focused first on compliance with IRCR algorithm requirements and secondarily with identifying potential reasons for noncompliance.

Results: In 2013, 42% of the TBI cohort met the criteria for an IRCR. The vast majority of cases with a TBI diagnosis complied with IRCR algorithm criteria; however, 14% of all reviewed cases required an IRCR but did not receive one. Provision of case management outside of the TBI/polytrauma clinic characterized a majority of noncompliant cases.

Implications for Case Management: Interdisciplinary care can be challenging, particularly in the outpatient setting, due to patient availability and access to care. Improved documentation in the electronic health record may assist case managers and other clinicians in coordinating rehabilitation care for Veterans with TBI. Case managers in the VA and other settings may find templates and trackable health factors helpful to identify patients in need of care plans.

Key words: *brain injuries, community integration, health plan implementation, rehabilitation, Veterans*

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Address correspondence to Joel Scholten, MD, Department of Physical Medicine and Rehabilitation (117), Washington DC VA Medical Center, 50 Irving St, NW, Washington, DC 20422 (Joel.Scholten@va.gov).

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Since 2001, more than 2 million service members have been deployed to Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and Operation New Dawn (OND) (Committee on the Assessment and the Readjustment Needs of Military Personnel, Veterans, and their Families, Board on the Health of Select Populations, Institute of Medicine, 2013). New body armor developed as protection from the ravages of improvised explosive devices and advances in medical care have increased the number of service members with severe injuries returning home with polytrauma (Cifu, Cohen, Lew, Jaffee, & Sigford, 2010; Department of Veterans Affairs, 2010a; Gawande, 2004; Sayer et al., 2008). The Veterans Health Administration (VHA) defines polytrauma as "two or more injuries … sustained in the same incident that affect multiple body parts or organ systems and result in physical, cognitive, psychological, or psychosocial impairments and functional disabilities" (Department of Veterans Affairs, 2013a). Traumatic brain injury (TBI) typically directs rehabilitation care for polytrauma providers (Department of Veterans Affairs, 2010a, 2013a).

VHA screens all post 9/11 Veterans for possible TBI, and those with a positive screen are referred for a Comprehensive TBI Evaluation (CTBIE) (Department of Veterans Affairs, 2007, 2010b). Of the 918,737 OEF/OIF/OND Veterans screened from April 2007 to January 31, 2015, 8.3% of the total population received a TBI diagnosis (Department of Veterans Affairs VHA Support Service Center, 2015). Mental health and pain diagnoses are highly prevalent within the cohort of Veterans with TBI. In Fiscal Year 2012, 72% of OEF/OIF/OND Veterans with a TBI diagnosis receiving VHA inpatient and outpatient care also had a comorbid posttraumatic stress disorder (PTSD) diagnosis and 54% of Veterans with a TBI diagnosis had both PTSD and pain diagnoses (Taylor et al., 2014).

Given the multiple comorbidities associated with TBI, the hallmark of TBI rehabilitation is individualized, interdisciplinary care (Department of Veterans Affairs, 2013a) to ensure that goals are communicated and coordinated, interventions are prioritized to focus on maximum functional improvement, and treatment efforts are not duplicated or in conflict (Hoge et al., 2008; Lew et al., 2007). Interdisciplinary care for TBI has been established in both military and civilian literature (Cifu et al., 2010; Cope, Mayer, & Cervelli, 2005; Sander & Constantinidou, 2008; Strasser, Uomoto, & Smits, 2008), with case studies and implementation research supporting the utilization of interdisciplinary care planning in OEF/OIF/OND populations (Lew et al., 2007; Ryan, Lee-Wilk, Kok, & Wilk, 2011).

Individualized Rehabilitation and Community Reintegration

VHA's Physical Medicine and Rehabilitation Program Office developed a templated electronic Individualized Rehabilitation and Community Reintegration (IRCR) plan-of-care note to improve identification and coordination of interdisciplinary care for Veterans receiving TBI rehabilitation (Department of Veterans Affairs, 2010a). The IRCR template, described in detail in *VHA Handbook 1172.04*, documents treatment goals focusing on improvement of function in "physical, cognitive, and vocational" realms, care coordination, and planned dates for the follow-up review of the plan by the interdisciplinary team (see Figure 1; Department of Veterans Affairs, 2010a).

This template was developed to address legislative requirements mandated by the 2008 National Defense Authorization Act legislation (Department of Veterans Affairs, 2010a; U.S. House of Representatives, 2007) and improve data collection and reporting on TBI rehabilitation provided in VHA. The template was released in 2010, and TBI teams gradually migrated to using it for documentation. In Fiscal Year 2013, the first full year of reporting, 6,471 IRCRs were recorded, which increased to 10,230 IRCRs in Fiscal Year 2014 (Department of Veterans Affairs VHA Support Service Center, 2015). However, to our knowledge, no definitive metrics or targets have been identified for use of the template and no psychometric studies have been completed to analyze the template.

VHA Algorithm

For operational purposes, VHA's Physical Medicine and Rehabilitation Program Office developed an algorithm to assist clinicians in identification of patients in need of an IRCR. Patients with a TBI diagnosis, receiving at least one skilled therapy intervention for TBI-related issues, and requiring case management, must have an IRCR (see Figure 2).

To our knowledge, no research exists to date on VHA's adoption of the IRCR care plan or objective determination of performance metrics for the use of IRCR. An in-depth analysis of IRCR utilization and documentation at our clinical location was completed as a quality improvement project to enhance identification and documentation of interdisciplinary TBI care. This study proposes to determine the level of compliance with the IRCR requirements used to identify Veterans in need of a care plan and to evaluate the reasons for inconsistent compliance. In addition, we hoped to provide a more objective assessment of Veterans with TBI requiring an IRCR to assist in establishing a target metric.

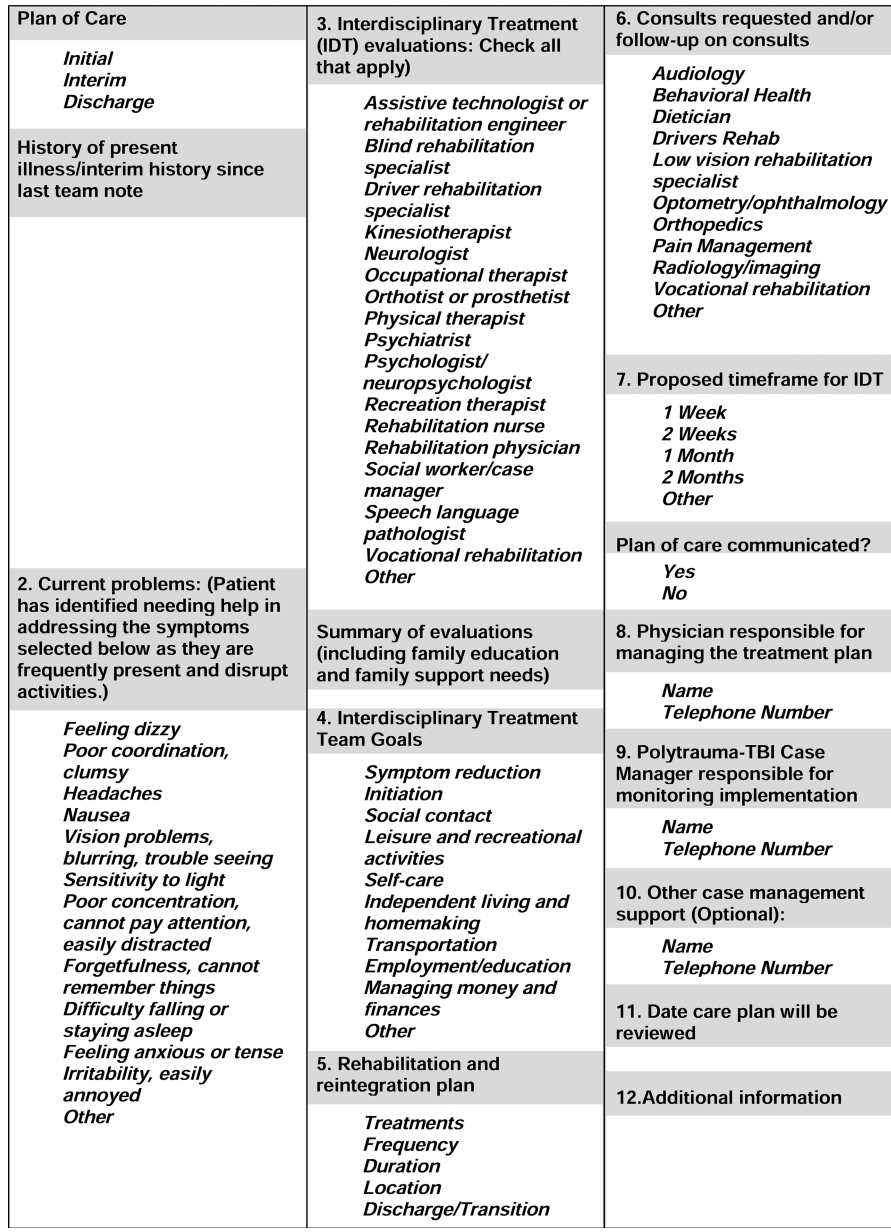

FIGURE 1
Component sections of the national electronic template for recording the IRCR in the VHA's electronic health record. From *VHA Handbook 1172.04: Physical Medicine and Rehabilitation Individualized Rehabilitation and Community Reintegration Care Plan*, by Department of Veterans Affairs, 2010a, Washington, DC: Veterans Health Administration. Copyright 2010 by U.S. Department of Veterans Affairs. Adapted with permission. IRCR = Interdisciplinary Rehabilitation and Community Reintegration; VHA = Veterans Health Administration.

Methods

The study proposal was reviewed and approved through the Washington DC VA Medical Center (DC VAMC) Research and Development Committee and institutional review board and was granted waivers of informed consent and HIPAA authorization before initiating research. Investigators conducted a retrospective medical record review of all Veterans with a TBI diagnosis seen in outpatient polytrauma clinics at the DC VAMC from January 1, 2013, to December 31, 2013. Cases were identified for review through data extraction from the Veterans Integrated Service Network 5 Data Warehouse. To meet inclusion for this study, cases must have had an outpatient visit to a polytrauma or Physical Medicine and Rehabilitation clinic in calendar year 2013 and a TBI diagnosis, determined by *International Classification of Diseases, Ninth Revision*, codes (see Figure 2). Five-hundred forty-six cases met the inclusion criteria for review.

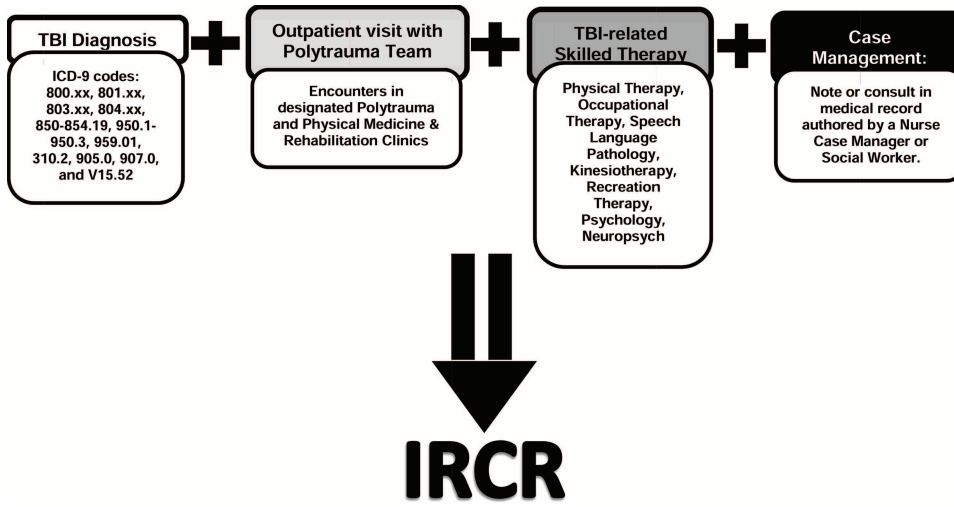

FIGURE 2
Algorithm used for determining need for an IRCR. Requirements to necessitate an IRCR include a TBI diagnosis (white), engagement with the polytrauma team (light gray), referral or engagement with TBI-related skilled therapy (dark gray), and case management (black). Second-level boxes document the *ICD-9* codes and other criteria used in this study to identify cases meeting algorithm criteria. *ICD-9* =*International Classification of Diseases, Ninth Revision*; IRCR = Interdisciplinary Rehabilitation and Community Reintegration; TBI = traumatic brain injury.

Initial Medical Record Review

Initial medical record review was completed by a research assistant. In addition to demographic information, data collection included type of skilled therapy referral and provision if requested, the presence or absence of case management, and date of IRCR if present. Skilled therapy was defined as physical therapy, occupational therapy, recreational therapy, speech–language pathology, kinesiotherapy, psychology, or neuropsychology interventions.

Defining case management from medical record review was challenging, as interactions with social workers and nurse case managers may be seen as case management or as intermittent resource utilization, that is, a patient is referred to a case manager to answer a specific question about available resources but no care or case coordination is provided. According to *VHA Handbook 1110.04*, "There are many diverse case management roles and practices within the VA" (Department of Veterans Affairs, 2013b). As case managers fulfill varied roles within the VA, for purposes of this review, case management was broadly defined to identify any potential cases that may meet the algorithm criteria. This included (1) cases with any notes from a clinician specifically identified in the medical record as a case manager; (2) cases where the patient affirmed a desire for case management and a social work consult was placed. If a Veteran had a documented interaction with a case manager for a single resource question, the Veteran was excluded from the analysis, that is, the Veteran contacted a case manager to obtain a VA form for benefits or request a list of community resources with no further clinical interaction. Case management may be provided through a variety of services, including, but not limited to, primary care, mental health, polytrauma, and special teams for Iraq and Afghanistan War Veterans. Future studies will be needed to definitively identify those Veterans receiving case management.

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Secondary Medical Record Review

All patient cases with a TBI diagnosis and referral or engagement with skilled therapy noted in the initial review underwent secondary review by two polytrauma clinicians to determine whether therapy was requested to treat a TBI-related condition. Rater concurrence was monitored throughout review cycles. The principal investigator provided feedback and additional training

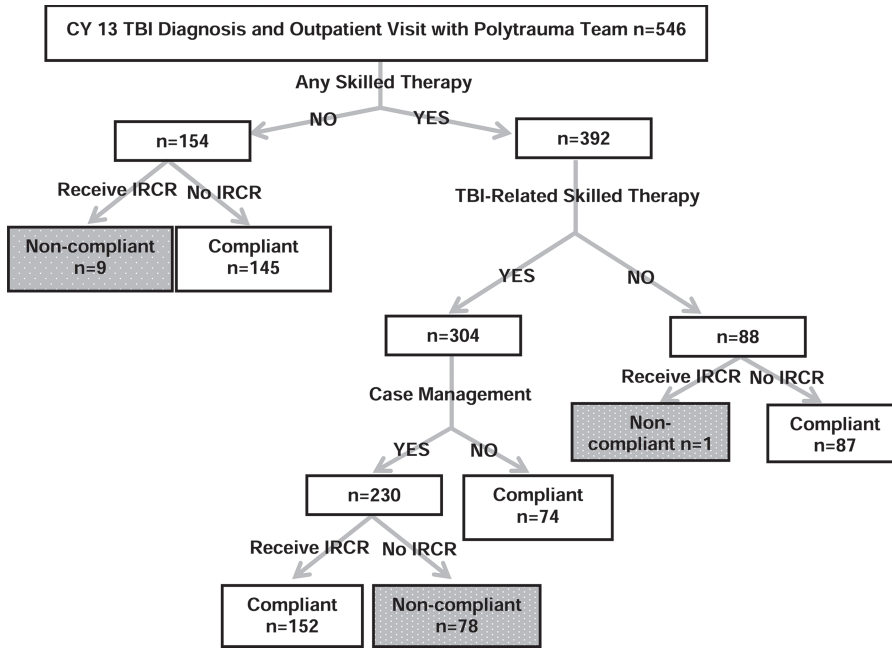

FIGURE 3
Compliance with the IRCR algorithm at a single outpatient polytrauma clinic, January 1, 2013–December 31, 2013. Compliant cases (white) were defined as those with a TBI diagnosis requiring skilled therapy and case management who received an IRCR in addition to all cases diagnosed with TBI without recommended TBI-related skilled therapy or case management that did not have a documented IRCR. Noncompliant cases (gray with dots) included those who received an IRCR without receiving TBI-related skilled therapy and cases that fulfilled the algorithm's criteria for an IRCR yet did not receive a documented care plan. IRCR = Interdisciplinary Rehabilitation and Community Reintegration; TBI = traumatic brain injury.

for the clinical reviewers to clarify the definition of TBI-related skilled therapy periodically throughout the review process. If the clinician reviews conflicted on determination of therapy provision to address a TBI-related issue, the case was reviewed by the principal investigator for final determination.

Data Analysis

Analysis focused, first, on compliance with IRCR algorithm requirements and, second, with identifying potential reasons for noncompliance. Compliant cases were defined as those in which algorithm criteria were met and an IRCR was completed as well as those without an IRCR who also did not meet algorithm criteria. Conversely, noncompliant cases were those in which IRCR algorithm requirements were met but with no IRCR documentation in addition to cases of documented IRCRs that did not fulfil the IRCR algorithm criteria.

Results

Of 546 reviewed charts, 392 received a skilled therapy referral and were forwarded to doctoral level clinicians to determine whether skilled therapy referral was initiated for TBI-related issues. Following the first half of case reviews (n = 196), rater concurrence measured 68%. After the principal investigator provided feedback, concurrence for the second half of cases rose to 81%. TBI-related skilled therapy was recorded in 304 of those cases, which were further reviewed for case management. In total, 230 cases met the algorithm criteria for TBI-related skilled therapy and case management (see Figure 3).

Medical record review demonstrated that 42% of the 546 Veteran TBI patients seen in our clinic in 2013 received case management and skilled rehabilitative care for TBI-related issue, thereby meeting the algorithm requirement for IRCR. As shown in Figure 3, only 66% (n = 152) of this cohort had an IRCR documented utilizing the electronic template. Of the 316 cases who did not meet IRCR algorithm

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criteria, 97% did not have a documented IRCR. The overall IRCR algorithm compliance rate and template usage was 84%, as cases not requiring an IRCR were vastly more compliant with the algorithm than cases requiring an IRCR.

To better understand reasons for lack of algorithm compliance, we reviewed the treatment course of the 78 Veterans without an IRCR who met algorithm requirements (see Table 1). The vast majority of these cases (79%) received case management by providers outside of the TBI/polytrauma team, including special teams for Iraq and Afghanistan War Veterans (n = 23), mental health (n = 23), primary care (n = 14), and specialty services (n = 2), such as spinal cord injury. Approximately one third (35%) had only limited participation in skilled therapy defined as not completing the full course of the recommended therapy. Nearly another third (31%) did not engage in recommended skilled therapy. A quarter (24%) of the cases received minimal skilled therapy intervention. An additional 19 cases were noncompliant due to the time frame of documentation. These cases were either in a chronic maintenance phase or an IRCR was completed outside the time frame of the study.

Ten cases had documented IRCR completion without meeting IRCR criteria. Timing was a significant factor for these cases. A majority of these Veterans (80%) were assigned a polytrauma case manager who scheduled an IRCR review prior to the Veteran's initial appointment with the rehabilitation physician. In these cases, the rehabilitation physician either determined that TBI-related skilled therapy was unnecessary or the Veteran declined a consult for skilled therapy.

Discussion

This study indicates that that 84% of the 546 Veteran cases with a TBI diagnosis receiving care during 2013 at an outpatient polytrauma clinic complied with established IRCR algorithm criteria. Of the total TBI population seen at the outpatient polytrauma clinic in 2013, 42% met IRCR algorithm requirements. VHA's Physical Medicine and Rehabilitation National Program Office is interested in objectively determining the percentage of patients who meet the algorithm criteria and require an IRCR to better evaluate compliance across the system. Previously, VHA had estimated that 20% of patients with a TBI diagnosis who receive care in a polytrauma clinic would likely require an IRCR (M. Cornis-Pop, personal communication, April 7, 2015). Our results, based on the experience of one outpatient polytrauma clinic, indicate this may be an underestimate and that additional research is needed to more accurately predict the percentage of patients across VHA who would require an IRCR. This is important as delivery of care is an intensive undertaking for TBI treatment teams. Although every Veteran deserves an individualized approach to his or her current symptoms, IRCR documentation efforts should be targeted to Veterans with a TBI diagnosis who will likely benefit from patient-centered TBI-related therapies.

Veterans with a TBI diagnosis commonly have comorbid conditions that complicate their treatment plan. In prior reports, Veterans undergoing a TBI evaluation were highly symptomatic, with more than half of all Veterans endorsing at least mild impairment on 21 of 22 Neurobehavioral Symptom Inventory Checklist items (only "change in taste or smell" was rated as absent in more than half of all subjects) (Scholten, Sayer, Vanderploeg, Bidelspach, & Cifu, 2012). Developing a treatment plan for each and every symptom is not feasible and therefore clinicians must engage Veterans to prioritize treatment targeting symptoms they believe to be most problematic to daily functioning.

TABLE 1
Treatment Course Among Those Who Did Not Have an IRCR But Met Requirements (N = 78)[a]

Subset	Definition	n (%)
Case management outside of polytrauma	Case followed by a case manager who was affiliated outside of polytrauma in 2013.	62 (79)
Limited participation	Case followed up with consult for skilled therapy but did not complete the recommended course of therapy.	27 (35)
Did not engage	Case was referred for skilled therapy but did not follow up on consult.	24 (31)
Minimal skilled therapy	Case engaged with skilled therapy, but the clinician discharged the patient in <30 days or less than 3 visits.	19 (24)
Chronic maintenance	Case received an IRCR prior to 2013 but was a long-term patient engaged with a case manager and some skilled therapy in 2013 but did not receive an IRCR.	13 (17)
Late with IRCR	Case should have received IRCR within 2 months of beginning skilled therapy in 2013 but did not receive one until >3 months later during 2014.	6 (8)

Note. IRCR = Interdisciplinary Rehabilitation and Community Reintegration.
[a]Overlap occurs between nonmutually exclusive characteristics resulting in n > 78 when totaled.

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We have identified potential barriers to IRCR adoption for each component of the algorithm and propose clinical adaptations to facilitate identification of Veterans in need of an IRCR with the ultimate goal of increased IRCR compliance. We are not aware of any other studies evaluating IRCR algorithm compliance and are not aware of any work studying template utilization to document interdisciplinary rehabilitative care.

Algorithm Component 1: Clinical Diagnosis and Referral for Skilled Therapy

The CTBIE appointment with a physician generally initiates the identification process for Veterans requiring an IRCR with a TBI diagnosis and referral(s) for TBI-related skilled therapy. Retrospective medical record review of patients with a TBI diagnosis revealed challenges in determining whether skilled therapy was recommended for TBI-related difficulties or for issues stemming from co-occurring conditions. Initial low interrater concurrence further reveals the challenges of identifying TBI-related therapy in the medical record. Because clinical judgment of the underlying cause of the symptom requiring skilled therapy is not currently documented as part of available medical note templates, there is no way to automate the process of determining whether an IRCR is required for a given patient. Improved documentation of TBI diagnosis in the medical record based on standardized questions and templates has been recommended to improve diagnostic accuracy and subsequent treatment in civilian cases seen in the emergency department (Bazarian, Veazie, Mookerjee, & Lerner, 2006; Powell, Ferraro, Dikmen, Temkin, & Bell, 2008). Similarly, one possible method for improving identification of interdisciplinary care needs is to assist clinicians with documentation of their rationale for skilled therapy at the time of initial TBI diagnosis. This would provide clarification for case managers and other clinicians responsible for IRCR implementation. To address this gap, a note template defining clinical rationale by the provider has already been implemented at our site. Previous research has suggested that templated documentation improves communication and collaboration among clinicians of different specialties for mental health (Cifuentes et al., 2015) and diabetes care (Haley et al., 2015); however, further research on the effectiveness of templated documentation within the Veteran TBI population is warranted.

Algorithm Component 2: Case Management

We observed that only two thirds of patients who should have had an IRCR received an IRCR; our findings suggest that case management outside of the polytrauma team may play a role. At our site, the polytrauma case managers coordinate each IRCR. The licensure of case managers embedded on the polytrauma team at our site included licensed clinical social workers and a certified rehabilitation registered nurse case manager. Other team members (occupational therapist, physical therapist, speech therapist, etc.) may at times serve as a care coordinator and point of contact for an individual Veteran after the case manager completes an assessment and contributes to the treatment plan. The availability of a case manager or care coordinator on the TBI team improves identification of IRCR need and subsequent documentation, per our review. Unfortunately, the availability of TBI/polytrauma case managers may be limited and, although Veterans with a TBI diagnosis may be receiving skilled rehabilitation services for TBI, they may best be served by maintaining case management/care coordination with their originally assigned care coordinator (mental health, primary care, etc.). Thus, strategies are needed to trigger completion of IRCR for Veterans with an assigned case manager outside of TBI/polytrauma. Possible methods for accomplishing this include developing a trackable health factor in the electronic health record, enabling TBI rehabilitation teams to more easily search for Veterans in need of an IRCR. This suggestion aligns with existing studies recommending use of flags in the electronic health record to identify chronic care patients to facilitate interdisciplinary collaboration and improve patient care (Haley et al., 2015; Murphy et al., 2014).

Algorithm Component 3: Engagement With Polytrauma Team

Of the cases in our review who needed but did not receive an IRCR, approximately one-third did not actively engage in treatment and another one-third had limited engagement with treatment. Lack of engagement is an important clinical problem, but determination of the cause of "nonengagement" was beyond the scope of this study. However, potential reasons for lack of engagement include geographic distance to care, time availability (both for the Veteran and the treatment team), and perceived benefit from recommended treatment. One additional factor may be that Veterans sometimes receive care from multiple other VHA providers, including primary care and mental health, as well as non-VHA providers. Again, potential solutions to increase compliance with IRCR requirements for patients who do not engage, even after skilled therapy is recommended, include the development of a trackable health factor in the electronic health record, enabling TBI rehabilitation teams to more easily search for Veterans in need of an IRCR. These findings could be further studied through qualitative analysis of clinical experiences with interdisciplinary rehabilitation teams.

Strengths and Limitations

The study was strengthened by the in-depth medical record review design completed by clinical experts. The members of the research team completing medical record review were embedded in the TBI/polytrauma team. Their clinical experience enabled a higher understanding of the clinical notes and thought processes behind referrals for skilled therapy. Furthermore, the study was strengthened by including Veterans seen over the course of an entire year.

This study was limited by its retrospective design. An objective analysis of clinician notes was complicated by subjective interpretations of clinician's reasoning. Frequently, clinicians do not record the reason for skilled therapy services and the experienced clinician reviewers opined on the whether they believed if therapy was to treat a TBI-related issue. This was challenging when potential skilled therapy services can be ordered for reasons that are not TBI-related. In this setting, the recommendation for skilled mental health services was the most common characteristic of noncompliant cases that met algorithm criteria. Because there is no true objective means to determine whether a current symptom is related to TBI or other comorbid conditions, a clinical determination is required. Difficulty in precise determination of case management is also a limitation. To capture the largest possible cohort, we used a broad definition of case management as inclusion criteria for the clinical algorithm. More extensive medical record review to determine whether true case management services were provided would be enlightening in future studies.

The decision to focus on IRCR compliance at one outpatient polytrauma clinic located in a large metropolitan area with significant TBI/polytrauma assets is another important limitation. Findings from medical centers with fewer TBI resources likely differ from our results and limit the generalizability of our findings. Documentation of interdisciplinary rehabilitation is important and fosters coordinated efforts for rehabilitation. Although our processes and algorithm are unique in VHA, a similar process could be employed in other health care settings, as structured interdisciplinary care is the foundation of TBI rehabilitation (Cifu et al., 2010; Cope et al., 2005; Lew et al., 2007; Ontario Neurotrauma Foundation, 2013; Ryan et al., 2011; Sander & Constantinidou, 2008; Strasser et al., 2008; The Management of Concussions/mTBI Working Group, 2009). A final limitation is that we did not fully review the treatment course for compliant cases. Thus, we do not know the proportion of compliant cases who did not fully engage in therapy or who received case management outside of polytrauma. Our findings, therefore, are not comprehensive or definitive but rather set the stage for further research in this area.

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Although our processes and algorithm are unique in VHA, a similar process could be employed in other health care settings, as structured interdisciplinary care is the foundation of TBI rehabilitation.

Conclusions

Individualized interdisciplinary care is the hallmark for TBI rehabilitation (Department of Veterans Affairs, 2013a). Eighty-four percent of cases reviewed complied with IRCR requirements. However, compliance was significantly higher in cases where an IRCR was unnecessary than among cases requiring a care plan. More than 40% of Veterans with a TBI seen in an outpatient polytrauma clinic over the course of a calendar year required an IRCR but only two thirds of those requiring an IRCR actually received one. The provision of case management services outside of the TBI team appears to be a significant factor for those cases meeting requirements but not receiving a care plan. Retrospective determination of the cause of persistent symptoms following a TBI diagnosis is difficult, and improved documentation at the time of initial TBI evaluation will likely improve the identification of Veterans in need of an IRCR. Interdisciplinary care delivery can be challenging, particularly in the outpatient setting, secondary to patient availability and coordinating schedules of specialists with clinical requirements across multiple settings. Efforts to improve utilization of the IRCR template should focus on clinician documentation at the time of TBI evaluation to further coordinate existing local VHA processes.

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Joel Scholten, MD, is Associate Chief of Staff for Rehab Services at the Washington DC VA Medical Center and National Director of the VA's Physical Medicine & Rehabilitation Program Office. He is Assistant Clinical Professor of Rehabilitation Medicine at Georgetown University School of Medicine and serves as Director of the DC VA's Advanced Polytrauma Fellowship program.

Ellen Danford, BA, is Health Science Specialist and Research Coordinator at the Washington DC VA Medical Center. During her time at the VA, Ms. Danford has been highly involved in quality improvement projects and randomized controlled trials.

Azadeh Leland, DScPT, is a graduate of University of Maryland post-professional doctor of science in physical therapy and rehabilitation services. She has also completed a 2-year fellowship in Polytrauma and Rehabilitation services at the VA. Dr. Leland has 25 years of clinical experience as a physical therapist.

Heather Malecki, DPT, is Polytrauma and Rehabilitation Coordinator for Physical Medicine & Rehabilitation at the Washington, DC VA Medical Center. She coordinates the VISN 5 Polytrauma Network Site and Polytrauma Support Clinic Teams. She serves as PT/TBI Fellowship Clinical Director for the Washington DC VA and on the VA National Physical Therapy Federal Advisory Board.

Douglas Bidelspach, MPT, currently serves as Rehabilitation Planning Specialist for Rehabilitation and Prosthetic Services in VA Central Office where he is responsible for database development, utilization, and management in support of planning and administration of VA rehabilitation and health care programs.

Brent Taylor, PhD, MPH, is Associate Director at the Minneapolis VA Health Care System's Center for Chronic Disease Outcomes Research. He is Associate Professor of Medicine and Adjunct Associate Professor of Epidemiology and Community Health at the University of Minnesota.

Nina A. Sayer, PhD, LP, is Deputy Director of the Center of Innovation (COIN) at the Minneapolis VA Healthcare System, the Center for Chronic Disease Outcomes Research (CCDOR). She is also Associate Professor in the Departments of Medicine and Psychiatry and Adjunct Associate Professor in the Department of Psychology at the University of Minnesota. Her funded research has examined posttraumatic stress disorders, psychiatric disability, unmet needs for mental health treatment, and traumatic brain injury/polytrauma.

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