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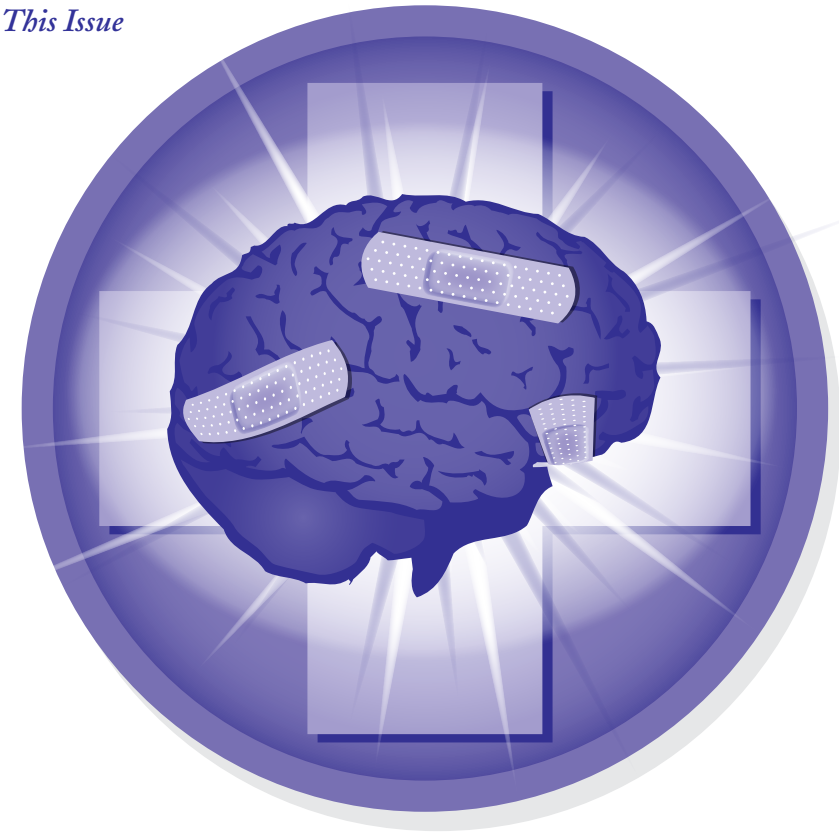

This issue of the *Residents' Journal* features two articles that address issues surrounding traumatic brain injury and posttraumatic stress disorder (PTSD). Moira Kessler, M.D., discusses the psychiatric symptoms following traumatic brain injury and provides recommendations for treatment. R. Brett Lloyd, M.D., Ph.D., describes virtual reality exposure therapy and presents clinical evidence for its use in treating PTSD. This month's issue also includes two articles commenting on the recent restrictions on intern work hours, implemented by the Accreditation Council for Graduate Medical Education in July 2011. Katy LaLone, M.D., shares with us her thoughts on how these newly implemented restrictions may affect opportunities that overnight call afforded, such as developing professional endurance and self-confidence and connecting with patients. Benjamin Neil Angarita, M.D., discusses how the previous work hours left residents more vulnerable to committing medical errors because of lack of sleep and often negatively affected their personal lives.

Psychiatric Symptoms Following Traumatic Brain Injury and Treatment Recommendations

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Traumatic brain injury (TBI) can be defined as an "externally-inflicted blow to the brain with a cause that is not of a degenerative, vascular, or congenital nature" (1). In addition to the medical complications caused by TBIs, there are often significant neuropsychiatric consequences as a result of such injuries. TBIs can be severely debilitating to one's physical and mental health. One of the most famous examples of TBI was the case of Phineas Gage, who in 1848 survived an accident in which a metal rod destroyed much of his frontal lobe. Gage's personality changed dramatically following this incident; once quiet and mild-mannered, he became both obscene and self-absorbed (1). The main focus of this article is to discuss psychiatric symptoms following TBI and to provide recommendations for treatment based on the data available (1).

Overview of Mental Illness and Traumatic Brain Injuries

As U.S. veterans return from military combat overseas, TBIs are becoming increasingly prevalent. A survey given to Operation Enduring Freedom/Operation Iraqi Freedom veterans estimated that 12%–15% of these veterans have experienced a mild TBI (2). Additionally, a literature review of TBIs conducted in 2009 estimated that more than 5.3 million people, or approximately 2% of individuals in the United States, are living with TBI (3). One would expect the prevalence to rise as more individuals return from war in the coming years. Since medicine has advanced over the years and more individuals with critical injuries survive TBIs, clinicians are starting to treat more patients with new psychiatric conditions. One study evaluated the prevalence of psychiatric disorders in nearly 1,000 participants who had experienced a TBI, compared with a group of patients without TBI (4). The study found that those who had TBI also had a greater prevalence of preinjury psychiatric illness, relative to comparison subjects (mild TBI, 28.5%; moderate-to-severe TBI, 37.5%; and no TBI, 17.0%). In the year following the injury, a psychiatric illness was found in 34% of patients with mild TBI and in 49% of those with moderate-to-severe TBI, compared with only 18% of patients in the non-TBI group (4). For patients without a prior psychiatric diagnosis, the adjusted relative risk for developing a psychiatric illness in the year following TBI was 2.1 for patients with mild TBI and 3.4 for patients with moderate-to-severe TBI (4). Specific symptoms experienced by individuals following TBI include depression, mania, anxiety, psychosis, aggression, apathy, poor attention, memory difficulties, and poor executive functioning. In terms of treatment of these psychiatric conditions, currently there is limited data available to create treatment standards (5). Difficulties in obtaining data include the lack of standard criteria in defining TBI severity and in diagnosing psychiatric conditions as well as difficulty in recruiting and retaining patients in randomized controlled studies (1).

Treatment Guidelines

Although little data exist regarding specific guidelines for treating various psychiatric conditions following TBI, there are general guidelines for safely and effectively treating these patients. First, clinicians are encouraged to use both pharmacologic and nonpharmacologic approaches (1). Pharmacologically, clinicians should "start low and go slow" because these patients may be especially sensitive to the effects of medications acting on the CNS. After beginning pharmacotherapy, clinicians should closely evaluate a patient's improvement by utilizing validated outcome measures (1). Additionally, drug-drug interactions must be closely monitored, since many TBI patients are treated with several medications (1). Finally, just like in the general patient population, treatment should be augmented when there is a partial response (1). While these recommendations can be applied to most patients, both with and without TBI, patients with TBI should be treated with the same caution applied in treating other vulnerable populations, such as the elderly.

Depression

Depression is the most common reported psychiatric condition in TBI patients and has the most data available regarding presentation, screening tools, and pharmacologic treatment (6). Studies have reported depression in 15.3%–60% of individuals who are post-TBI (3). There is evidence that depressed mood is more often demonstrated by irritability, frustration, anger, and aggression rather than by sadness or tearfulness (6). Studies have compared depression screening tools to determine which ones have the best sensitivity and specificity in diagnosing depression in the TBI population. One study found that the Neurobehavioral Functioning Inventory-Depression Scale and the Patient Health Questionnaire were both effective in ruling out major depression in TBI patients (6). However, the Patient Health Questionnaire-9 was effective in ruling in major depression following TBI (6). In terms of pharmacologic treatment, most evidence supports the use of either tricyclic antidepressants or sertraline, and both these treatments have been recommended by the Neurobehavioral Guidelines Working Group (1). Among tricyclic antidepressants, amitriptyline and desipramine have been shown to be effective (5). However, use of these medications is limited by side effects, especially the increased risk of seizure (1,

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5). One review reported that 19% of TBI patients experienced a seizure while being treated with tricyclic antidepressants (3). Selective serotonin reuptake inhibitors (SSRIs) are thought to be safer options for TBI patients. Sertraline is recommended for treatment based on a single-blind placebo trial, which showed an 87% response rate in depressed patients (1, 3, 5). Other studies have examined the use of fluoxetine and citalopram in TBI patients. A small open-label study of fluoxetine reported improvement in TBI patients with no depression to moderate depression (3). An open trial that combined citalopram treatment with carbamazepine treatment reported significant improvement on Brief Psychiatric Rating Scale scores and on Clinical Global Impression scores; however, no specific depression rating scale was used to evaluate treatment effectiveness (3). Therefore, from the data available, SSRIs appear to be a safe and effective option for treating depression in TBI patients. Sertraline, specifically, has been recommended for these patients, but this may be because of limited data for other SSRIs.

Anxiety

Anxiety is also common in TBI patients, with rates ranging from 41%–77% (6). The treatment of anxiety is based on very limited data. A case report and retrospective study both found venlafaxine to be effective in treating compulsions (1). Benzodiazepines are not recommended because TBI patients are likely to be more susceptible to the side effects of this group of medications and because they may cause paradoxical agitation in these patients (1). Although research has yet to be conducted regarding the use of SSRIs in the treatment of anxiety in TBI patients, given the efficacy of these medications for treating anxiety in the general patient population, the safest option may be to start an SSRI (or other agent with a low side effect profile) and then follow the aforementioned general treatment guidelines.

Mania

Mania has been reported in 9% of patients with TBI (3). Similar to anxiety and depression, few studies have examined the treatment of mania in TBI patients, and the literature only encompasses case reports and uncontrolled studies. Case reports have shown lithium to be effective in treating mania in patients with moderate-to-severe TBI (3). However, lithium decreases the seizure threshold in these patients, who are already more prone to seizures (1). Additionally, lithium has a narrow therapeutic index, and thus patients may have difficulty adhering to the medication within a safe and effective range (1). Valproate also has been shown to be effective for patients whose symptoms do not respond to lithium or neuroleptics (1, 3). Other case studies have reported success in treatment with ECT, quetiapine, thioridazine, amitriptyline, clonidine, and carbamazepine (1, 3). According to the current literature, valproate appears to be a safe and effective treatment option for mania. However, atypical antipsychotics may also be beneficial for treatment of mania in TBI.

Psychosis

While psychosis is a less prevalent psychiatric symptom in TBI patients, it occurs more often in this population than in the general population (5). Specifically, psychotic symptoms occur in 0.7%–8.9% of patients who have experienced TBI (3). The Neurobehavioral Guidelines Working group recommended olanzapine to treat psychosis in these patients based on case reports showing that it was an effective treatment (1, 5). One report suggested that clozapine may be less desirable than other atypical antipsychotics because it might be associated with significant sedation, weight gain, and seizures in TBI patients (5). Typical antipsychotics are not recommended for this patient population, since TBI patients may be more vulnerable to extrapyrimidal symptoms (1). Additionally, studies have shown poorer outcomes in rehabilitation and poorer neuronal recovery in animal models using these agents (1). Based on the available data, olanzapine, and likely other atypical antipsychotics, are a safe and effective treatment for psychosis in TBI patients.

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Conclusions

Individuals with TBI experience severe medical and neuropsychiatric consequences, and such injuries are a growing concern in the United States because of military combat overseas. While millions of individuals are affected, the data are still limited regarding the diagnosis and treatment of psychiatric conditions in this patient population. Until more data become available, clinicians will likely primarily rely on basic treatment guidelines. There is a need for more controlled studies in order to create specific guidelines for clinicians. Various limitations exist in obtaining data, including difficulty recruiting and retaining patients and differences in categorizing TBIs and in making psychiatric diagnoses. However, since the number of individuals with TBI will likely increase significantly in coming years, the supply of research will need to meet this demand.

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References

1. Vaishnavi S, Rao V, Fann JR: Neuropsychiatric problems after traumatic brain injury: unraveling the silent epidemic. Psychosomatics 2009; 50:198–205
2. Huckans M, Pavawalla S, Demadura T, Kolessar M, Seelye A, Roost N, Twamley EW, Storzbach D: A pilot study examining effects of group-based Cognitive Strategy Training treatment on self-reported cognitive problems, psychiatric symptoms, functioning, and compensatory strategy use in OIF/OEF combat veterans with persistent mild cognitive disorder and history of traumatic brain injury. J Rehabil Res Dev 2010; 47:43–60
3. Chew E, Zafonte RD: Pharmacological management of neurobehavioral disorders following traumatic brain injury: a state-of-the-art review. J Rehabil Res Dev 2009; 46:851–879
4. Fann JR, Burington B, Leonetti A, Jaffe K, Katon W, Thompson RS: Psychiatric illness following traumatic brain injury in an adult health maintenance organization population: Arch Gen Psychiatry 2004; 61:53–61
5. Warden DL, Gordon B, McAllister TW, Silver JM, Barth JT, Bruns J, Drake A, Gentry T, Jagoda A, Katz D, Kraus J, Labbate LA, Ryan LM, Sparling MB, Walters B, Whyte J, Zapata A, Zitnay G: Guidelines for the pharmacologic treatment of neurobehavioral sequelae of traumatic brain injury. J Neurotrauma 2006; 23:1468–1501
6. Seel RT, Macciocchi S, Kreutzer JS: Clinical considerations for the diagnosis of major depression after moderate to severe TBI. J Head Trauma Rehabil 2010; 25:99–112

Virtual Reality Technology for the Treatment of PTSD

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The lifetime prevalence of posttraumatic stress disorder (PTSD), based on revised estimates (1), is 4%, and a higher incidence exists among women (2). The rate varies based on the type of trauma, with interpersonal traumas carrying the highest risk of developing the disorder. Among service members returning home from recent military conflicts, the incidence of PTSD is even higher than in previous conflicts and may be 11%–19% in select populations (3). PTSD may be conceptualized as a deficiency in the natural recovery process, which includes fear extinction. Evidence-based therapies target faults in the recovery process.

Currently, the best evidence for treatment of PTSD supports a modified form of cognitive-behavioral therapy. Prolonged exposure, developed by Foa and Rothbaum, has a large evidence base and is centered on addressing the failure of fear extinction (4, 5). Prolonged exposure therapy was first supported by empirical evidence in 1999, and in 2007 the Institute of Medicine recommended it as first-line treatment for PTSD (6).

A common problem is that patients may be unwilling to directly confront or revisit trauma memories. Underengagement in the activation of the fear structure during exposures leads to poor outcomes. Bradley et al. found that 67% of patients with PTSD who are able to complete one of these evidence-based therapies will no longer meet diagnostic criteria for the disorder, but residual symptoms among these patients will remain and may affect their quality of life (7). Additionally, the recovery rate for all patients entering treatment is 56%. This leaves a large group of patients who still meet full criteria for the disorder or who are unable to complete the evidence-based treatments.

A rising concern in the field is how to address these treatment failures. Virtual reality is a technology that has been used in other fields and may be a valuable alternative to engaging patients in treatment and overcoming obstacles in these more traditional therapies. In this article, I will describe the most commonly used virtual reality hardware and software. Second, I will discuss the current evidence for virtual reality exposure therapy for treating several types of PTSD. Finally, I will highlight the benefits and limitations of this therapy type as well as potential future directions.

Virtual Reality Therapy: Description of the Tool

An important element that makes virtual reality effective is immersion of the patient into the virtual world, creating a realistic and believable experience. By engaging the senses in a multimodal fashion, the fear structure that needs to be altered may be better activated. The clinician has the ability to control the environment intensity and the number of stimuli related to the scenario, thus impacting and regulating the patient's anxiety level and progress through the therapy (8). Although active memory retrieval by the patient is optional, both activation of senses and production of context-relevant cues may activate the underlying pathological fear structure so that emotional processing may begin.

The virtual reality human computer interface is used to immerse the patient in an interactive three-dimensional world. The most common arrangement includes a head-mounted display with an integrated tracking system to deliver both audio and video components. The patient may sit or stand on a vibration platform, typically equipped with low-frequency emission speakers, to engage tactile (or haptic) stimulations. Olfaction may be engaged with context-specific smells entered into the treatment area and controlled by fans. The software is able to determine the user's position and movements via body tracking sensors and subsequently provide feedback to update the output appropriately. Moreover, the user may engage further via a hand controller or rubberized M-16 to navigate or interact with the scenarios (9, 10).

The clinician controls the environment using an interface separate from that of the patient in order to control the number and type of stimuli within each scenario. Based on the patient's feedback and physiological measures, the clinician may either reduce or increase the number of stimuli to keep the user engaged but not overstimulated (9, 10). Overall, this technology allows the clinician to evaluate a range of cognitive, affective, and behavioral responses within simulated environments (11).

Clinical Evidence for Virtual Reality Therapy

There are numerous case reports describing the use of virtual reality technology for the treatment of PTSD related to several trauma types, and these trials target traumas experienced by both combat veterans and civilians. The primary outcome measures are reduction in scores on the Clinician-Administered PTSD Scale (12) or the PTSD Checklist, military version (13), which has been shown to be similar to the former but less time intensive.

One of the earliest trials demonstrating proof of concept using virtual reality for the treatment of PTSD used the Virtual Vietnam program to elicit trauma memories. Virtual Vietnam has the capacity to present two virtual environments: one with a Huey helicopter flying over various indigenous terrains and another with a clearing surrounded by a jungle scene. In most trials for virtual reality exposure therapy, patients are oriented to the therapy and introduced to the virtual reality simulation during the first two sessions, and they subsequently recount their trauma memories while immersed in the virtual environment, with the introduction of graded stimuli to evoke

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responses (14). Rothbaum et al. reported a mean Clinician-Administered PTSD Scale score of 68 at trial entry, indicating a symptomatic population, and this score was reduced to 57 at trial completion (14). The mean score decreased to 47 ($p<0.002$) at the 6-month follow-up evaluation (Table 1). Additionally, there were significant decreases in all PTSD symptom clusters and depression symptoms (14). These data support the utility of virtual reality exposure therapy for PTSD symptom reduction in a relatively treatment-resistant population.

To address military service members associated with more recent conflicts, the Virtual Iraq/Virtual Afghanistan system was structured around scenes from the Xbox video game "Full Spectrum Warrior." The virtual environment was designed to include a 24-square block town of streets with realistic stimuli and a second scenario involving a desert road that crosses bridges, structures, and checkpoints. Measures of hyperactivity, such as heart rate variability, skin conductance, respiration, and finger temperature, were incorporated for use as objective data on overall arousal during exposure (9).

Two reports have described small trials of active-duty soldiers treated with the Virtual Iraq/Virtual Afghanistan exposure therapy. Reger et al. recruited 24 service members and found a 23% reduction in PTSD Checklist, military version, scores (baseline score, 61; posttreatment score 47, $p<0.001$) (15). At the conclusion of the study, nine individuals no longer met full criteria for PTSD, and 62% had a decrease of at least 11 points in their scores on the PTSD Checklist. McLay et al. also used virtual reality exposure therapy, comparing this type of therapy with treatment as usual, which was defined as current evidence-based therapies for PTSD, medication management, substance use disorder treatment, or a combination of these three (16). The cohort showed a significant decrease in the mean Clinician-Administered PTSD Scale score from baseline (mean score, 84) to after 10 weeks of therapy (mean score, 47) (16).

In an ongoing trial, the current aims are to examine how virtual reality exposure therapy performs when compared with prolonged exposure therapy, the gold standard, and to describe changes in baseline functional magnetic resonance imaging (fMRI) patterns before and after treatment (17). Prior to treatment, an fMRI scan is performed, and the participant, a military service member, performs an affective Stroop test, measuring attention, cognition, and processing speed (17). Participants are randomly assigned to virtual reality exposure therapy or prolonged exposure therapy and scanned after completion of the treatment protocol. A recent update reported on eight individuals who completed the posttreatment scan, and the data were pooled for early comparison (18). The pretreatment scans showed increased activity in the amygdala, subcallosal gyrus, and left prefrontal cortex and reduced activity in the anterior cingulate cortex when a negative stimulus was presented. These signals were all reduced in magnitude at the posttreatment endpoint (18). This suggests that fMRI may be a useful tool in monitoring treatment progress with therapy, although more data are needed to make more definitive conclusions.

In 2007, Difede et al. reported on the use of virtual reality technology to treat civilians with a diagnosis of PTSD related to trauma during the attack on the World Trade Center (19). This trial compared virtual reality exposure therapy with treatment as usual, similar to the MacLeod trial. The graded exposures involved initially viewing the buildings alone and later viewing increasing elements related to the attack until the full scenario was presented. The authors detected a 40% reduction in the mean Clinician-Administered PTSD Scale score by the end of the trial, from 63 at

Table 1. Characteristics of Clinical Trials Using Virtual Reality

					Outcome Score Throughout Trial					
					Entry (Baseline)		End		Follow-Up Evaluation	
Study	Virtual Program	N	Treatment Arms	Primary Outcome	Mean	SD	Mean	SD	Mean	SD
Rothbaum et al., 2001 (14)	Virtual Vietnam	16	Virtual reality exposure therapy only	Clinician-Administered PTSD Scale score	68.0	15.3	57.8	20.6	47.1*	17.0
Difede et al., 2007 (19)	World Trade Center	13 (Virtual reality), 8 (Wait list)	Virtual reality exposure therapy vs. wait list	Clinician-Administered PTSD Scale score	62.5	19.5	39.9	25.8	27.3*	16.3
Reger et al., 2011 (15)	Virtual Iraq/ Afghanistan	24	Virtual reality exposure therapy only	PTSD Checklist, Military Version, score	60.9	11.0	*47.1	12.7		
McLay et al., 2011 (16)	Virtual Iraq/ Afghanistan	10 (Per group)	Virtual reality exposure therapy vs. treatment as usual	Clinician-Administered PTSD Scale score	83.5	18.1	*48.1	36.9		

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baseline to 40 at completion, and the mean score decreased further to 27 by the 6-month follow-up evaluation ($p<0.01$) (Table 1). Moreover, there was a significant time-by-group interaction and large effect size (19).

Utility and Future Directions

The benefits of virtual reality-based therapy, compared with traditional therapies, are numerous. This technology may create a robust, reproducible environment with elements that mimic cues present during the natural trauma. It uses a multimodal sensory approach to engage emotional memories while the clinician measures response. For younger generations, virtual reality may be either more appealing or associated with fewer stigmas. As virtual systems are further developed, the scenarios may be tailored to specific trauma types.

Like most therapies, there are some drawbacks and limitations in using virtual reality exposure therapy. Cost may be a significant concern, and the participant must be familiar with the technology so that it does not impede on the therapeutic process. For some patients, the scenarios may be too realistic, and they may become overengaged, resulting in flooding.

Currently, virtual reality exposure therapy for PTSD is still in its infancy, although data are becoming more robust regarding its utility as another tool in the arsenal for treatment. Although most studies currently focus on treatment, in the future, virtual reality exposure therapy may be used proactively to prevent PTSD. Virtual reality may also be useful in stress resilience training before service members are deployed into combat, allowing soldiers to develop and/or augment current skills in coping with adversity. Moreover, stress resilience training may be applied to civilian jobs that require exposure to traumatic situations, not limited to police and rescue workers (8, 20).

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References

1. Narrow WE, Rae DS, Robins LN, Regier DA: Revised prevalence estimates of mental disorders in the United States: using a clinical significance criterion to reconcile 2 surveys' estimates. Arch Gen Psychiatry 2002; 59:115–123
2. Tolin DF, Foa EB: Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. Psychol Bull 2006; 132:959–992
3. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL: Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. N Engl J Med 2004; 351:13–22
4. Foa EB, Hembree E, Rothbaum BO: Prolonged exposure therapy for PTSD: Emotional Processing of Traumatic Experiences, Therapist Guide. New York, Oxford University Press, 2007
5. Foa EB, Rothbaum BO: Treating the Trauma of Rape: Cognitive-Behavioral Therapy for PTSD. New York, Guilford Press, 1998
6. Institute of Medicine Committee on Treatment of Posttraumatic Stress Disorder: Treatment of Posttraumatic Stress Disorder: An Assessment of the Evidence. Washington, DC, National Academies Press, 2008. http://www.nap.edu/catalog/11955.html
7. Bradley B, Greene J, Russ E, Dutra L, Westen D: A multidimentional meta-analysis of psychotherapy for PTSD. Am J Psychiatry 2005; 162:214–227

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8. Rizzo A, Parsons TD, Lange B, Kenny P, Buckwalter JG, Rothbaum B, Difede J, Frazier J, Newman B, Williams J: Virtual reality goes to war: a brief review of the future of military behavioral healthcare. J Clin Psychol Med Settings 2011; 18:176–187
9. Rizzo AS, Difede J, Rothbaum BO, Reger G, Spitalnick J, Cukor J, McLay R: Development and early evaluation of the Virtual Iraq/Afghanistan exposure therapy system for combat-related PTSD. Ann N Y Acad Sci 2010; 1208:114–125
10. Rothbaum BO, Rizzo AS, Difede J: Virtual reality exposure therapy for combat-related posttraumatic stress disorder. Ann N Y Acad Sci 2010; 1208:126–132
11. Rizzo A, Schultheis MT, Kerns K, Mateer C: Analysis of assests for virtual reality applications in neuropsychology. Neuropsychol Rehab 2004; 14:207–239
12. Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, Keane TM: The development of a Clinician-Administered PTSD Scale. J Trauma Stress 1995; 8:75–90
13. Wathers F, Litz BT, Herman D, Huska J, Keane TM: The PTSD Checklist (PCL): reliability, validity, and diagnostic utility, in the Proceedings of the Annual Convention of the International Society for Traumatic Stress Studies, San Antonio, 1993
14. Rothbaum BO, Hodges LF, Ready D, Graap K, Alarcon RD: Virtual reality exposure therapy for Vietnam veterans with posttraumatic stress disorder. J Clin Psychiatry. 2001; 62:617–622
15. Reger GM, Holloway KM, Candy C, Rothbaum BO, Difede J, Rizzo AA, Gahm GA: Effectiveness of virtual reality exposure therapy for active duty soldiers in a military mental health clinic. J Trauma Stress 2011; 24:93–96
16. McLay RN, Wood DP, Webb-Murphy JA, Spira JL, Wiederhold MD, Pyne JM, Wiederhold BK: A randomized, controlled trial of virtual reality-graded exposure therapy for post-traumatic stress disorder in active duty service members with combat-related post-traumatic stress disorder. Cyberpsychol Behav Soc Netw 2011; 14:223–229
17. MacLeod CM: Half a century of research on the Stroop effect: an integrative review. Psychol Bull 1991; 109:163–203
18. Roy MJ, Francis J, Friedlander J, Banks-Williams L, Lande RG, Taylor P, Blair J, McLellan J, Law W, Tarpley V, Patt I, Yu H, Mallinger A, Difede J, Rizzo A, Rothbaum B: Improvement in cerebral function with treatment of posttraumatic stress disorder. Ann N Y Acad Sci 2010; 1208:142–149
19. Difede J, Cukor J, Jayasinghe N, Patt I, Jedel S, Spielman L, Giosan C, Hoffman HG: Virtual reality exposure therapy for the treatment of posttraumatic stress disorder following September 11, 2001. J Clin Psychiatry 2007; 68:1639–1647
20. Bartone P: Resilience under military operational stress: can leaders influence hardiness? Military Psychol 2006; 18:S131–S148

The Benefits of Overnight Call: A Chief Resident's Reflections on the New ACGME Duty Hours

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It was one of those dreaded nights. One in which I was freshly reminded of the painful toll that sleep deprivation takes on your mind, your body, and your soul. The emergency department was steadily busy, and I had finally escaped for a brief moment. But then my pager sounded again, and I cringed as I heard myself say, "I'll be right there." It was a moment I had encountered before—a moment of decision in which the duty of being a professional clashed with my body's own need for rest. I was exhausted, frustrated, and felt like crying. It wasn't fair. Irrational thoughts began streaming through my mind, thoughts of destroying the pager, thoughts of mutiny. But after a moment of rebellious imagination, I got up, took a longing glance at my untouched call-room bed, and returned to the emergency department. After all, I was the doctor on call, and a patient needed me.

As I reflect back on my residency, I am struck that the lessons I learned while on call were some of the most formative of my professional development. First, I learned to trust my instincts early on when I was the only psychiatrist in the hospital. Although my attending was always available by phone, I was the one seeing the patients with my own eyes and weighing the risks and benefits of each decision in my own mind, and this greatly contributed to my self-confidence. Furthermore, overnight call taught me a level of personal toughness beyond what I had ever experienced. Although painful, I learned endurance as I worked steadily through the night, one patient at a time, and was able to survive until morning. Lastly, I believe call afforded me some very meaningful opportunities to connect with patients. Knowing that I would be staying in the hospital allowed me to take the time I needed to sit with patients amid their suffering and reassure them that I would be there all night long. Looking back, I realize that it was on call when I first felt proud to be a physician who could meet patients at their point of need.

The new Accreditation Council for Graduate Medical Education duty-hour restrictions are based on the core tenet of "graded and progressive responsibility," which creates a system in which residents gain responsibility for patients only after being able to demonstrate their skills (1). This is a marked change in the concept of resident education, since in the past responsibility for patient care was immediate and thought to be essential in the development of residents' skills. Unintentionally, this change could inhibit residents' ability to trust their intuition and decision making if they are no longer allowed to care for patients independently. In addition, the development of professional "toughness," described as "a physician's ability to focus on the patient regardless of competing demands," is often acquired from "being on the frontline often and over time (2)." As a result of less frontline time and less rigorous hours, residents may be deprived of a valuable opportunity to learn endurance and thus be less capable of placing their patients' needs ahead of their own (2). Moreover, further restrictions on duty-hours, especially in the earlier training years, require the creation of shift work, which leads to "less immersion in the lives of patients and less sense of responsibility for patients as individuals (3, 4)." This may also, unfortunately, decrease opportunities for residents to connect with their patients and build therapeutic rapport (3, 4).

In summary, the new duty-hour restrictions will inevitably challenge how future residents will be able to adequately learn self-confidence and personal toughness and ultimately how they will be able to connect with patients. It is our task to create an innovative and educational environment that continues to foster professional development, one in which residents can confidently say, "I feel proud to be a physician who can meet patients at their point of need."

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References

1. Accreditation Council for Graduate Medical Education: Common Program Requirements: Effective: July 1, 2011. http://www.acgme.org/acWebsite/home/Common_Program_Requirements_07012011.pdf
2. Rasminsky S, Lomonaco A, Auchincloss E: Work hours regulations for house staff in psychiatry: bad or good for residency training? Acad Psychiatry 2008; 32:54–60
3. Caplan JP, Querques J, Freudenreich O, Kontos N: Work-hour regulation: collateral damage to consultation psychiatry. Am J Psychiatry 2008; 165:915; author reply 916
4. Rabjohn PA, Yager J: The effects of resident work-hour regulation on psychiatry. Am J Psychiatry 2008; 165:308–311

A PGY-2's Reflections on the ACGME Mandated Changes in Intern Work Hours

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On July 1, 2011, the Accreditation Council for Graduate Medical Education (ACGME) increased its restrictions on intern work hours. I became a PGY-2 at the time these changes were implemented. Based on these new restrictions, PGY-1-level residents can only work a maximum of 16 continuous hours, and residents at the PGY-2-level or higher can work 24 continuous hours plus an additional 4 hours to participate in transition of care activities. This differs from the prior regulations under which all residents could work 24 continuous hours plus 6 additional hours, including work in both direct patient care and transition of care activities (1, 2). The ACGME stated that these changes were made because "although there is limited research on the connection between fatigue and medical errors for the entire resident community, there are data that indicate fatigue has an influence on the frequency of errors by first-year residents who are the least experienced and the most vulnerable (3)."

The ACGME cited data from the Landrigan et al. article titled "Effect of Reducing Interns' Work Hours on Serious Medical Errors in Intensive Care Units," published in 2004 in the New England Journal of Medicine (4). The authors conducted a prospective randomized study comparing the rates of serious medical errors made by interns working a traditional schedule with extended (24 hours or more) work shifts every third night versus the rates of serious medical errors made by interns working a staggered schedule in which their longest shift did not exceed 16 hours. Landrigan et al. found that interns working the traditional 30-hour shifts made more serious medical errors (36% more), including ordering doses of medication that exceeded the standard dose, missing a diagnosis of Lyme disease, and administering drugs known to provoke allergies (4, 5). In addition, the senior resident or nursing staff did not intercept 50% of these serious medical errors (4, 5).

Although laypeople were likely not surprised by the results of the Landrigan et al. study, some physicians were surprised because they believe that doctors can practice medicine well with little sleep. Even when confronted with these data, almost every medical specialty organization and 79% of residency program directors were against the ACGME's changes in intern work hours (4). Perhaps in response to these concerns, the

Table 1. ACGME Intern Work-Hour Restrictions Before and After July 1, 2011

Restriction	Before July 1, 2011 (7/1/2003–6/30/2011)	After July 1, 2011 (7/1/2011–Present)
Limit on hours of work per week	Eighty hours per week averaged over 4 weeks.	Eighty hours per week averaged over 4 weeks.
Limit on duty period length of shift	Residents at the PGY-1 level and above are permitted to work 24 continuous hours plus 6 additional hours (including direct patient care activities and transition of care).	PGY-1 residents are permitted to work a maximum of 16 continuous hours. PGY-2 (and above) residents are permitted to work 24 continuous hours plus an additional 4 hours to participate in transition of care activities.
Limit on in-hospital on-call frequency	Every third night, on average (no specifications were given on the ACGME website concerning the average time period).	For psychiatry rotations, every fourth night averaged over a 4-week period (specialty-specific requirements apply).
Least amount of time off between scheduled duty periods	Ten-hour time period provided between all daily duty periods and after in-house call.	Eight hours free of duty between scheduled duty periods.
Limit on frequency of in-hospital night duty	Specialty-specific requirements apply.	Residents must not be scheduled for more than 6 consecutive nights of night duty (night float).
Least amount of mandatory time off	Twenty-four hours off per a 7-day period averaged over 4 weeks, inclusive of call.	Twenty-four hours off per a 7-day period (when averaged over 4 weeks). Home call cannot be assigned on these free days.

continued on page 11

continued from page 10

ACGME gave the review committees of neurological and orthopedic surgery the power to grant an exception of up to 10% of the 80-hour limit to individual programs (6). As a medical student, I also believed that I could practice medicine well with little sleep. However, my experiences as an intern this past year have taught me that this is not the case. While I was an intern rotating in pediatric services, it took a significant amount of time to obtain a blood sample, which might not have been the case under ordinary circumstances.

In addition to being vulnerable to committing medical errors in the hospital, I was also vulnerable to committing serious errors in my personal life, with equally dire consequences. For example, I remember taking my son to the playground after work during the beginning of my PGY-2 year and thinking to myself, "Wow, this is the first time I am taking my son to the playground by myself, and he is about to turn 1." As a PGY-1 resident, the only thing I had time for post call was catching up on my sleep, instead of spending time with my family who were eagerly waiting for me to return home from the hospital. My lack of sleep not only put my patients at risk, it also put my marriage and my relationship with my son at risk.

In conclusion, I hope the new ACGME mandated work-hour restrictions for interns do not have adverse effects on medical training or patient care, since resident physicians will have less experience caring for patients at their time of graduation than resident physicians in prior years, and patient care may be hindered by the increase in cross-coverage and decrease in continuity of care because the primary responding interns are forced to leave the hospital after 16 hours. I also hope that interns recognize that although our training as residents is important, our responsibilities to our families and the lives of our patients should not be compromised.

Dr. Angarita is a second-year resident on the physician-scientist track in the Department of Psychiatry, Mount Sinai School of Medicine, New York.

References

1. Accreditation Council for Graduate Medical Education: Proposed Standards, the ACGME Task Force on Quality Care and Professionalism: Process for Developing Recommendations on New Supervision and Resident Duty Hour Standards. http://acgme-2010standards.org/proposed-standards.html (Accessed September 16, 2011)
2. Accreditation Council for Graduate Medical Education: ACGME Program Requirements for Graduate Medical Education in Psychiatry. http://www.acgme.org/acWebsite/downloads/RRC_progReq/400_psychiatry_07012007_u04122008.pdf (Accessed September 16, 2011)
3. Accreditation Council for Graduate Medical Education: The ACGME Task Force on Quality Care and Professionalism: Process for Developing Recommendations on New Supervision and Resident Duty Hour Standards (Executive Summary). http://acgme-2010standards.org/pdf/Executive_Summary.pdf (Accessed September 16, 2011)
4. Landrigan CP, Rothschild JM, Cronin JW, Kaushal R, Burdick E, Katz JT, Lilly CM, Stone PH, Lockley SW, Bates DW, Czeisler CA: Effect of reducing interns' work hours on serious medical errors in intensive care units. N Engl J Med 2004; 351:1838–1848
5. Sanghavi D: The Phantom Menace of Sleep-Deprived Doctors. August 5, 2011, New York Times. http://www.nytimes.com/2011/08/07/magazine/the-phantom-menace-of-sleep-deprived-doctors.html?pagewanted=all
6. Accreditation Council for Graduate Medical Education: Frequently Asked Questions: ACGME Common Duty Hour Requirements. http://www.acgme.org/acwebsite/dutyhours/dh-faqs2011.pdf (Accessed November 1, 2011)

Book Review

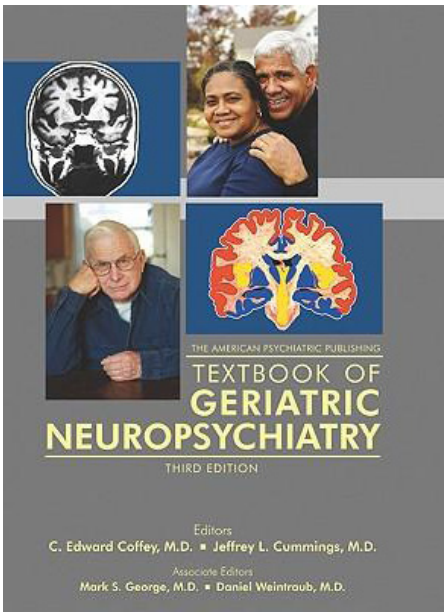
The American Psychiatric Publishing Textbook of Geriatric Neuropsychiatry, Third Edition

David Hsu, M.D.
Departments of Psychiatry and Internal Medicine, University of California, Davis, Sacramento, Calif.

The time is ripe for the new edition of this textbook, published 11 years after the second edition. American psychiatrists have been promoting an interdisciplinary approach to care. General psychiatrists as well as geriatric psychiatrists have been pivotal in this movement. The American Psychiatric Association and the Institute of Psychiatric Services hold meetings specifically addressing the area of integrated care. The Institute of Medicine is also studying the mental health needs of the elderly. By 2030, there will be approximately 70 million people over age 65 living in the United States. Geriatric care is a public health concern, and geriatric neuropsychiatry is at the forefront of research.

Geriatric neuropsychiatry is an integrated specialty encompassing geriatric medicine, geriatric psychiatry, and neuropsychiatry. The intellectual curiosity of practitioners in this field is prominent throughout this book. One interesting chapter is titled, "Neurobiology of Aging," wherein the author, Richard E. Powers, M.D., summarizes all the research that has been conducted to date on the aging brain. The images of anatomical slices as well as the tables are all comprehensive in scope. Few can summarize a century's worth of data into one chapter, but Dr. Powers did just that.

The textbook is divided into four parts: introduction to geriatric neuropsychiatry, neuropsychiatric assessment, principles of neuropsychiatric treatment, and neuropsychiatric syndromes. There are 29 chapters in total, with 15 devoted solely to neuropsychiatric syndromes. The authors are keen on emphasizing principles without sacrificing practicality. Clinical methods, such as the neuropsychiatric



The American Psychiatric Publishing Textbook of Geriatric Neuropsychiatry, Third Edition

Edited by C. Edward Coffey, M.D., and Jeffrey L. Cummings, M.D. Washington, DC, American Psychiatric Publishing, 2011, 786 pp., $219.00.

examination as well as neuropsychological testing, bridge clinical findings with targeted brain structure. Emerging neuroimaging methods, such as single-photon emission computed tomography, fluorodeoxyglucose positron emission tomography, and functional magnetic resonance imaging, are described in an evidence-based and easy-to-read manner. Functional imaging studies have advanced to show contribution of neural networks, even when pathology is not readily visible on structural imaging studies.

These chapters speak to the practicing clinician as well as the cutting-edge researcher. Pharmacology and stimulation therapies are readily accessible, and the book's detail devoted to the medical physiology surrounding ECT is greatly appreciated. Standard neuropsychiatric syndromes, such as pain, epilepsy, stroke, and dementia, are good references for the general psychiatrist. Dr. Robert Robinson's chapter on cerebrovascular disease is particularly unique in that neuropsychiatrists can now pinpoint symptoms to specific affected brain sites. Drs. Costa and McCrae's chapter of personality psychology in relation to aging and dementia is also informative.

Anyone interested in the care of older adults should read this textbook on geriatric neuropsychiatry. Drs. Coffey and Cummings are prominent in the field, and they have edited a book that can speak to a wide array of disciplines. At a time when our patients are getting older, arming ourselves with as much neuroscience as possible through an accessible text will help in the long run. Psychiatry residents, particularly, should look to this text when studying for in-service and Board examinations as well as in their efforts to understand and better help their patients afflicted with neuropsychiatric syndromes. For those going into the field of geriatric psychiatry or neuropsychiatry, this textbook will undoubtedly serve as a stepping stone for continued learning.

Dr. Hsu is a fourth-year resident physician in psychiatry and internal medicine at the University of California, Davis, Sacramento, Calif. He is also the Gene Cohen fellow on the Committee of Aging for the Group for the Advancement of Psychiatry and an Honors Scholar for the American Association of Geriatric Psychiatry.

Letter to the Editor

Treatment for Co-Occurring Eating, Borderline Personality, and Substance Use Disorders

To the Editor: In the August 2011 issue of the Residents' Journal, Maria Levine, M.D., (1) presented an interesting case of a young man with co-occurring bulimia, bipolar disorder, and borderline personality disorder, marked by cutting behaviors and impulsivity, cocaine abuse, and probable affective illness. Despite treatment with psychodynamic therapy and pharmacotherapy, including lamotrigine, clonazepam, and escitalopram, the patient relapsed within 2 years, experiencing a "depressed and labile mood, low energy, loneliness, emptiness, and a return to binging behaviors" and began overexercising. While Dr. Levine appropriately highlighted the high rates of comorbidity between eating disorders and other conditions, such as borderline personality disorder, and concluded that treatment of individuals with these comorbidities requires a "multidirectional treatment plan," we felt that it could be helpful to provide some ideas concerning what treatment might entail.

Based on data obtained from studies of female patients with similar comorbidities, a more tailored psychotherapeutic intervention could have included dialectical behavioral therapy. Courbasson et al. (2) found that emotional dysregulation leading to maladaptive coping strategies and impulsive behaviors lead to poor outcomes in patients with eating disorders, substance use disorders, and bipolar disorder. Dialectical behavioral therapy has been shown to improve emotional regulation, decrease impulsivity, improve mood, and decrease maladaptive behaviors (2, 3). In a patient such as the young man in Dr. Levine's case report, who had multiple comorbidities associated with impaired regulation of emotion, dialectical behavioral therapy may provide an integrated treatment modality effective in treating the underlying psychopathology rather than treating individual symptoms, which may decrease the number of relapses or at least improve the patient's ability to cope with any relapses.

References

1. Levine M: Co-occurring eating, borderline personality, and substance use disorders. Am J Psychiatry Res J 2011; 6(8):10–11
2. Courbasson C, Nishikawa Y, Dixon L: Outcome of dialectical behavioral therapy for concurrent eating and substance use disorders. Clin Psychol Psychother 2011 (Epub ahead of print March 18, 2011)
3. Axelrod SR, Perepletchikova F, Holtzman K, Sinha R: Emotion regulation and substance use frequency in women with substance dependence and borderline personality disorder receiving dialectical behavior therapy. Am J Drug Alcohol Abuse 2011; 37:37–42

Nicole R. Edmond, M.D.

Laura M. Mayol, M.D.

Almari Ginory, D.O.

Drs. Edmond and Mayol are first-year fellows in the Department of Psychiatry, Division of Child and Adolescent Psychiatry, University of Florida, Gainesville, Fla. Dr. Ginory is a first-year fellow in the Department of Psychiatry, Division of Forensic Psychiatry, University of Florida, Gainesville, Fla.

Response to Edmond et al. Letter

To the Editor: I appreciate your interest in my case report and your valuable recommendations regarding treatment for this group of patients. As shown in the report, comorbidities are common with borderline personality disorder. These disorders, which may include mood disorders, substance-related disorders, eating disorders, and anxiety disorders, can complicate both the diagnosis and treatment of borderline personality disorder. However, psychotherapy is the primary treatment for borderline personality disorder. Long-term dialectical behavioral therapy, in which patients have an opportunity to learn to control their emotions and behaviors, appears to be the most effective modality for adolescents and young adults. Unfortunately, the patient discussed in the report did not receive dialectical behavioral therapy during the course of his treatment. Based on the data, however, dialectical behavioral therapy is a crucial part of the treatment modality for other patients with similar diagnoses.

Maria Levine, M.D.

Dr. Levine is a first-year child and adolescent psychiatry fellow at the University of Nevada School of Medicine.

TEST YOUR KNOWLEDGE

In preparation for the PRITE and ABPN Board examinations, test your knowledge with the following questions.
(answers will appear in the next issue)

In preparation for the PRITE and ABPN Board examinations, test your knowledge with the following questions (answers will appear in the next issue).

This month's questions are courtesy of Milos Starovic, M.D. Dr. Starovic is a third-year resident in the Department of Psychiatry, Maimonides Medical Center, Brooklyn, N.Y.

Question #1

A patient was admitted to the psychiatric inpatient unit for disorganized behavior and command auditory hallucinations. During an episode of acute agitation, he was medicated in order to lessen his symptoms and establish safety and behavioral control. Subsequently, he experienced a generalized tonic-clonic seizure. The patient was most likely medicated with which one of the following?

A. Intramuscular olanzapine
B. Intramuscular haloperidol
C. Intramuscular fluphenazine
D. Intramuscular chlorpromazine

Question #2

A 30-year-old married woman without a history of psychiatric disorders presented with complaints of hearing both a male and female voice commenting on her behavior. Her husband reported that she had been extremely agitated and had been neglecting her hygiene and self-care. She believed that her husband was using the kitchen microwave to control her mind and broadcast her thoughts to their neighbors. During the evaluation, she demonstrated a blunted affect and suspiciousness. Which of the following symptoms are consistent with Schneider's first-rank symptoms for schizophrenia?

A. Agitation, blunted affect, and auditory hallucinations
B. Neglect of hygiene and self-care, delusions of control, and auditory hallucinations
C. Thought broadcasting, delusions of control, and auditory hallucinations commenting on the patient's behavior
D. Thought broadcasting, delusions of control, and neglect of self-hygiene

ANSWERS TO DECEMBER QUESTIONS

Question #1

Answer: C Desipramine

Antidepressant medications with antimuscarinic effects can cause constipation, tachycardia, and urinary retention. Tricyclic antidepressants have prominent antimuscarinic activity. However, secondary amines such as desipramine are least likely to cause these side effects.

Reference

1. Burt VK, Stein K: Treatment of women, in The American Psychiatric Publishing Textbook of Psychiatry, 5th ed. Edited by Hales RE, Yudofsky SC, Gabbard GO. Washington, DC, American Psychiatric Publishing, 2008

Question #2

Answer: B 12 weeks

Measurement of nuchal translucency may identify cardiovascular malformations as early as 12 weeks of gestation. Structural ultrasound reveals cardiovascular and other anatomical anomalies at 18 weeks of gestation.

Reference

1. Burt VK, Stein K: Treatment of women, in The American Psychiatric Publishing Textbook of Psychiatry, 5th ed. Edited by Hales RE, Yudofsky SC, Gabbard GO. Washington, DC, American Psychiatric Publishing, 2008

We are currently seeking residents who are interested in submitting Board-style questions to appear in the Test Your Knowledge feature. Selected residents will receive acknowledgment in the issue in which their questions are featured.
Submissions should include the following:
1. Two to three Board review-style questions with four to five answer choices.
2. Answers should be complete and include detailed explanations with references from pertinent peer-reviewed journals, textbooks, or reference manuals.
***Please direct all inquiries and submissions to Dr. Seawell; mseawell@med.wayne.edu.**

Author Information for *The Residents' Journal* Submissions

The Residents' Journal accepts manuscripts authored by medical students, resident physicians, and fellows; manuscripts authored by members of faculty cannot be accepted.

1. **Commentary:** Generally includes descriptions of recent events, opinion pieces, or narratives. Limited to 500 words and five references.
2. **Treatment in Psychiatry:** This article type begins with a brief, common clinical vignette and involves a description of the evaluation and management of a clinical scenario that house officers frequently encounter. This article type should also include 2-4 multiple choice questions based on the article's content. Limited to 1,500 words, 15 references, and one figure.
3. **Clinical Case Conference:** A presentation and discussion of an unusual clinical event. Limited to 1,250 words, 10 references, and one figure.
4. **Original Research:** Reports of novel observations and research. Limited to 1,250 words, 10 references, and two figures.
5. **Review Article:** A clinically relevant review focused on educating the resident physician. Limited to 1,500 words, 20 references, and one figure.
6. **Letters to the Editor:** Limited to 250 words (including 3 references) and three authors. Comments on articles published in *The Residents' Journal* will be considered for publication if received within 1 month of publication of the original article.
7. **Book Review:** Limited to 500 words and 3 references.

Abstracts: Articles should not include an abstract.

Upcoming Issue Themes

Please note that we will consider articles outside of the theme.

February 2012
Contact Sarah M. Fayad: fayad@ufl.edu

March 2012
Section Theme: Memory Disorders
Guest Section Editor: Sarah Jane De Asis, M.D.
Sarah.deasis@yale.edu

April 2012
Section Theme: Family Psychiatry
Guest Section Editor: Michael Ascher, M.D.
michaelaschermd@gmail.com

May 2012
Section Theme: Sexual Disorders
Guest Section Editors: Almari Ginory, D.O., Laura Mayol-Sabatier, M.D., and Nicole Edmond, M.D.
ginory@ufl.edu

June 2012
Section Theme: Advocacy in Psychiatry
Guest Section Editor: John Lusins, M.D.
drjlusins@gmail.com