Post-traumatic stress disorder (PTSD) occurs in up to 58% of persons exposed to potentially life-threatening trauma (American Psychiatric Association [APA], 1994). It is characterized by intrusive and distressing thoughts, nightmares, avoidance of and physiological reactivity to trauma-related stimuli, insomnia, and increased startle response (APA, 1994). PTSD can interfere substantially with activities of daily living (ADL), including work performance. Studies in pain rehabilitation settings suggest that PTSD symptoms may be present in many persons with work-related chronic pain and that these symptoms should be addressed if return to work is to be successful (Burgess, Hibler, Keggan, & Everly, 1996; Geisser, Roth, Bachman, & Eckert, 1996).

Within the occupational therapy literature, a variety of theoretical models have been applied to the understanding and treatment of PTSD, including object relations theory (Froelich, 1992) and approaches emphasizing therapeutic rituals and emotional catharsis (Short-DeGraff & Engelmann, 1992). Within the clinical psychology literature, the most widely accepted theory of PTSD emphasizes a more behavioral approach, with a focus on learning principles. It proposes that the primary symptoms of PTSD represent a learned association (classical conditioning) between the intense anxiety encountered during the actual trauma and stimuli (e.g., visual, auditory, proprioceptive) present in the traumatic situation (Kilpatrick, Veronen, & Resick, 1979). According to classical conditioning principles, such learned anxiety reactions should diminish over time, with repeated exposure to the stimuli under conditions that are not inherently anxiety provoking (i.e., extinction). However, persons with PTSD tend to avoid stimuli that trigger anxiety, resulting in a failure to extinguish the learned anxiety reactions. Decreased anxiety accompanying avoidance further reinforces the avoidance behavior (operant learning).

Persons with PTSD are often treated by occupational therapists in psychiatric settings (Froelich, 1992). Typically, these clients are experiencing PTSD subsequent to sexual abuse or military combat. Despite the relative frequency of PTSD in some occupation therapy settings, a search of the occupational therapy literature revealed no studies that have addressed evaluation and treatment of PTSD subsequent to work-related trauma and no literature that has addressed the role of occupational therapy in achieving return to work in persons with work-related PTSD.

The most widely used PTSD treatment approach in the clinical psychology literature is exposure therapy, which is based on the learning model described previous-
ly. It is particularly used by psychologists in the treatment of combat survivors (Lyons & Keane, 1989). Through controlled reexposure to trauma-related stimuli, the person is assisted in processing the trauma-related emotions and gradually becomes desensitized to the traumatic cues (Sipprelle, 1992). This desensitization process reflects the eventual extinction of learned anxiety upon exposure to trauma-related cues in a safe environment. This report documents the interdisciplinary use of exposure techniques during work-simulation activities to facilitate return to work in a person with both chronic pain and PTSD.

Background
The client was a 34-year-old divorced man with a college education and employed as an industrial inspector. Job duties included administrative work at the sedentary level as well as nonsedentary activities such as ladder climbing, walking on scaffolding, and walking on elevated beams. He experienced a work-related traumatic fall through a scaffold plank 100 ft above the ground during which he was caught by his armpits on the scaffold flooring. The impact of the fall caused low back pain and knee injuries. Initially, the client received physical therapy modalities for back pain, including heat, trigger point massage, and a home exercise program. He later received trigger point and epidural steroid injections administered by an osteopathic physician. To address persistent knee pain, he underwent a lateral left knee release and, 10 months later, a left knee arthroscopy for debridement. Because persistent low back pain was still a major impediment to his return to work, the client entered a 4-week, interdisciplinary chronic pain program 27 months after injury. This program included medical and nursing care, psychological intervention (including biofeedback), occupational therapy, physical therapy, vocational rehabilitation, and therapeutic recreation. When first seen, he was unable to work and was receiving workers’ compensation benefits.

Evaluation
Medical evaluation revealed sacroiliac joint dysfunction and myofascial pain syndrome, which included trigger points in the left low back area. Medications at evaluation included tramadol (50 mg p.r.n.), amitriptyline (100 mg q.h.s.), and naproxen sodium (500 mg t.i.d.). Major depression was diagnosed on the basis of a psychological evaluation, but the client denied symptoms of PTSD at that time. Physical therapy evaluation revealed sacral torsion, decreased lower-extremity strength and flexibility, leg length discrepancy, and decreased abdominal strength. The occupational therapy evaluation included the Canadian Occupational Performance Measure (COPM) (Law et al., 1991), a client-centered assessment designed to assist with treatment planning and to measure functional outcomes (Yasuda, 1996). The client identifies problem areas in occupational performance (e.g., working, socializing, parenting) and then rates the importance of those areas on a scale from 1 (not important at all) to 10 (extremely important). Perceived competence with occupational performance as well as satisfaction with that performance are also rated on a scale from 1 to 10.

Performance and satisfaction scores were markedly low in the client-identified problem area of work. The COPM also identified other problem areas, including driving, shopping, and socialization, and the client used the results of the COPM to plan treatment goals (see Table 1). A videotape of the client performing functional tasks, including grooming, laundry, and homemaking, was reviewed. The treatment initially focused on cognitive therapy for depression and improving pain coping skills. Because the client denied symptoms of PTSD at evaluation, no treatment for PTSD was initially planned.

On the basis of the occupational therapy evaluation and recommendations from the vocational rehabilitation counselor, it was determined that return to work in the client’s previous job was a feasible treatment goal, and his employer held the job open for him. Factors indicating a positive prognosis included a long work history and that the majority of the client’s job responsibilities were at the sedentary level.

Treatment Plan
Medical treatment included discontinuing tramadol and amitriptyline (because of side effects) and introducing nortriptyline. Physical therapy focused on improving sacroiliac alignment and increasing abdominal strength as well as lower-extremity strength and flexibility. Psychological treatment initially focused on cognitive therapy for depression and improving pain coping skills. Because the client denied symptoms of PTSD at evaluation, no treatment for PTSD was initially planned.

The occupational therapy intervention plan included structured work-simulation activities (sedentary, non-sedentary). Sedentary tasks included completing office tasks, such as bookkeeping and typing at a computer, while alternating sitting and standing. Non-sedentary tasks included climbing a ladder, walking on elevated beams, and balancing on a rocker board (to simulate walking and standing on uneven surfaces). Other occupational therapy goals were improving posture and body mechanics and improving performance in home maintenance, commu-
nity, and parenting tasks. The client was also referred to driver’s rehabilitation, a service provided by an occupational therapist and a driving instructor, to evaluate his safety and to decrease his severe low-back pain while driving.

**Treatment Procedures**

At evaluation, the factors that interfered with occupational performance were decreased endurance, poor sitting tolerance, poor use of body mechanics, poor postural awareness, and decreased self-efficacy. To address these multiple problem areas, the client’s occupational therapy intervention was designed to be comprehensive, including complex ADL training, work simulation, craft activities, endurance training, and education in posture and body mechanics. Reported here are those aspects of treatment directly related to addressing work-related trauma in work-simulation activities. Overall, the client received 18 individual or group sessions of occupational therapy during his 4-week treatment program.

During the 3rd week of treatment, the occupational therapist began to address work activities, including ladder climbing and walking on elevated and uneven surfaces. Substantial anxiety and autonomic arousal (i.e., sweating, tachycardia, flushed face) were noted when the client walked a 6-in. high balance beam and climbed a ladder. The client also reported severely increased low back pain while attempting to balance on an uneven surface (i.e., the rocker board).

After the occupational therapist reported these observations to the treatment team, the psychologist suggested that the client might be experiencing increased symptoms of PTSD due to exposure to trauma-related cues, and this was confirmed during subsequent reevaluation. Because the client’s anxiety was associated with work-related activities and cues, it was expected that exposure therapy integrated with presentation of trauma-associated work activities under occupational therapy supervision would provide an optimal treatment outcome. Therefore, co-treatment between occupational therapy and psychology during work-simulation activities was proposed to help the client to achieve his return-to-work goals, which included being able to walk on an elevated beam, tolerate uneven surfaces, and climb a 12-ft ladder without complaints of pain and without evidence of anxiety.

**Session 1**

During the first session, the client walked on a balance beam that was 4-in. wide and 6-in. above the ground. Feelings of instability as he walked the beam provided proprioceptive cues that triggered intense traumatic memories associated with increased anxiety and loss of balance. At the outset of treatment, he was unable to traverse the 6-ft long beam without falling. The occupational therapist provided assistance to maintain the client’s balance while the psychologist guided him through exposure therapy. Because of the client’s difficulty in performing this task, no other activities were attempted during the first session.

The exposure therapy component of treatment involved the psychologist closely monitoring the client’s level of anxiety and distress through frequent SUDS ratings and monitoring (through verbal prompts) the trauma-related memories being triggered by the tasks. To extinguish the

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**Table 1**

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<thead>
<tr>
<th>Problem Area</th>
<th>Performance</th>
<th>Satisfaction</th>
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<td>Shopping</td>
<td>3</td>
<td>8</td>
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<td>Socialization</td>
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*Note: Performance = ratings for client’s perceived competency to perform activities in the designated area (1 = unable to do it; 10 = able to do it well). Satisfaction = ratings for client satisfaction with performance in the designated area (1 = not satisfied at all; 10 = extremely satisfied).*
learned association between cues and intense anxiety, the client was asked to maintain focus on the trauma-related memories each time his SUDS rose above 30/100. To counteract the client's typical avoidance response (i.e., moving off the balance beam), his focus was maintained on the anxiety-provoking cues with prompting until his SUDS rating decreased to below 20/100. This process resulted in his learning a less anxious response to the trauma-related stimuli. During this initial session, the client's SUDS reached 50/100 on several occasions, each time prompting loss of balance. His highest level of distress was 70/100, which was prompted by a slight rocking of the balance beam. During each period of elevated anxiety and trauma-related memories, he reported substantially increased trigger point pain. With repeated exposure, the client decreased his maximal anxiety level upon crossing the beam to 35/100 and was able to walk the beam several times without falling.

Session 2
The second session consisted of imaginal exposure to the entire traumatic experience while seated in the psychologist's office. This was the only session at which the occupational therapist was not present, because no work-simulation activities were being performed. The client reported SUDS ratings of 70/100 to 85/100 at several points while describing his fall. He also recalled a forgotten, second near fall during the same episode, prompting dramatically increased anxiety. He reported significantly increased pain while focusing on memories of the fall and its painful aftermath. He was able to decrease his SUDS to 5/100 to 15/100 while focusing on traumatic images by the end of this session.

Session 3
During this session, the client's maximal SUDS rating while walking the balance beam was lower, achieving 60/100 on only one occasion and otherwise remaining below 40/100, even while experiencing traumatic memories. He was able to cross the beam repeatedly with a SUDS of 0/100 by the end of the session. The client also attempted balancing on the rocker board, using a modified plantigrade four-point stance with upper-extremity support from a raised table. Shortly after beginning this task, he happened to look out of the window (10th story) and quickly jumped off the board because of anxiety. However, he attempted this task again, with the occupational therapist providing weight shifting and balance assistance and with the psychologist keeping the client focused on anxiety-provoking memories. As his anxiety increased, the client had difficulty with full weight bearing on his left leg and required occasional cues to stabilize his left knee. The session progressed from the client using a four-point stance to his taking an upright stance with graded, manual assistance for trunk stabilization from the occupational therapist. His maximal SUDS ratings during this activity was 50/100. By the end of the session, he was able to perform the task at a 10/100 SUDS level.

Session 4
This session included weight shifting on the rocker board in a standing position without upper-extremity support. Assistance from the occupational therapist for balance and weight shifting gradually decreased. The rocker board was placed next to the 10th-story window to provide additional height cues for the exposure. Stimuli similar to the sounds of the accident (e.g., aluminum "clanking") were also added. Initially, exposure to these additional sensory cues prompted increased trauma memories and anxiety, requiring more assistance for balance. However, with continued exposure, the client was able to maintain complete stability without considerable anxiety, even while rocking. His maximal SUDS rating during this activity was 50/100, although he was eventually able to decrease this to 5/100, even with exposure to trauma stimuli.

Session 5
During this session, the client's work-simulation tasks were upgraded to provide a more intense experience of height cues. Tasks included climbing a 12-ft ladder positioned next to a fifth story window. The session progressed to walking on a 4-in. wide by 6-ft long beam without rails that was elevated 4 ft above the floor. Despite the upgraded tasks, his maximal SUDS rating was only 20/100, with most ratings below 10/100. The client also reported experiencing no distressing memories of the trauma while performing these tasks.

Outcome
On discharge, the client could climb a 16-ft ladder without experiencing major PTSD symptoms or increased pain. He could also independently walk on a wooden beam of 6-in. height and stand on a rocker board using full lower-extremity weight shifting without loss of balance. The client's performance and satisfaction as indicated by his COPM scores had increased substantially in all problem areas (see Table 1). The client was released to work with the following temporary restrictions: (a) no walking on elevated surfaces more than 10 ft high without rails and (b) no walking on catwalks more than 30 ft high. Additionally, it was recommended that he gradually increase his climbing to and walking on high surfaces while accompanied by another worker if needed. The client understood the rationale and process of exposure.
therapy and was instructed on conducting his own continued exposure therapy at home and work. At 1-month follow-up, he had returned to work and was independently continuing his exposure therapy at home via a home program designed by the occupational therapist. The home program included activities such as walking on elevated beams, climbing a ladder, and performing play activities with his children on unstable surfaces (e.g., a trampoline).

During a follow-up telephone conversation 6 months after discharge, the client had changed jobs for an unrelated reason and was working as an instructor for a college program that trained safety inspectors. He was able to walk independently on elevated beams of 4 ft to 5 ft in height and to climb 8-ft ladders without anxiety or performance deficits. He was also able to walk on the first level of scaffolding (approximately 7 ft to 8 ft above the ground). The client was continuing his self-directed exposure techniques and was working on being able to ascend to the second level of scaffolding. The COPM score for performance in work activities at follow-up remained an 8, the same as at discharge, indicating a high level of perceived ability to carry out work activities. The client was unable to report a satisfaction score regarding work performance because he had only recently started his new job.

Conclusion

Psychological responses to trauma, especially clinical disorders such as PTSD, can serve as major barriers to occupational performance. Common work-simulation activities may reveal these psychological barriers and provide an opportunity for intervention. Exposure therapy for PTSD is typically performed imaginally. However, this case study was unique in describing the co-treatment of PTSD and it promoted competence in the performance of required work activities.

Work by Burgess et al. (1996) indicated that PTSD may be a relatively frequent occurrence after work-related trauma. Other authors (e.g., Geisser et al., 1996) have suggested that treatment of PTSD may facilitate return to work in some clients with chronic pain, and this is consistent with our case study. Therefore, we recommend that if avoidance and physiological arousal are observed during work-simulation activities in a client with history of traumatic injury, the possibility of PTSD as a treatment barrier should be evaluated. Although occupational therapists are trained to work with persons with psychiatric conditions, exposure therapy for treatment of PTSD is a specialized behavioral treatment approach typically provided by clinical psychologists. For the techniques to be of maximum benefit, we recommend that a professional specifically trained in the use of exposure techniques either be used on a consultative basis or provide co-treatment during occupational therapy intervention.

References


