

VIRTUAL REALITY HYPNOSIS  
FOR THE TREATMENT OF POST TRAUMATIC ACUTE STRESS DISORDER: CASE  
STUDY ON A BURNED, BALI BOMBING SURVIVOR

**Abstract:**

A burned, Bali bombing survivor developed Acute Stress Disorder (ASD) following admission to hospital. Virtual Reality Hypnosis (VRH) was provided as an adjunct to existing therapy. Patient reports indicate that VRH prevented insomnia, panic episodes, nightmares and feelings of depression. Staff reports indicate that VRH reduced analgesic requirements, and reduced patient calls for nursing assistance. Sequential psychiatric assessment revealed reduced symptoms of anxiety, panic and negative cognitions.

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Major trauma is associated with significant psychiatric morbidity, and estimates by Stein *et al* (2000) indicate that Posttraumatic Stress Disorder (PTSD) develops in 12% of trauma survivors. Chronic forms of PTSD have relatively low remission rates, and may be associated with comorbidities including depression, adjustment disorders, and substance abuse (Roca *et al.*, 1992).

Acute Stress Disorder (ASD) is a frequent precursor to PTSD, and estimates by Harvey and Bryant (2000) indicates that 80% of trauma survivors with ASD advance to PTSD. Mild to moderate symptoms of ASD frequently develop in trauma patients with burn injuries (Taal and Faber 1998), resulting in longer average bed stays, additional medical complications, and greater difficulties with physical and psychological adjustments following their discharge from hospital (Fauerbach *et al.*, 1997). Other types of traumatic events that cause ASD include combat (Simms *et al.*, 2002; Glenn *et al.*, 2002), natural disasters (Mc Farlane and Papay 1992), motor vehicle accidents (Blanchard *et al.*, 1995) and crime or injury (Resnick *et al.*, 1993).

On the 12<sup>th</sup> of October 2002, terrorists exploded an incendiary device that destroyed the Sari nightclub (Bali, Indonesia) and fatally injured 202 people. Survivors were stabilized at Denpasar Hospital (Bali) and subsequently transported to hospitals throughout Australia for specialist treatment. A 28-year-old male survivor was admitted to the Burns Unit of a large metropolitan hospital with burns to 45% of his total body surface area and bilateral tympanic membrane rupture.

Physical progress and medical management were compromised within 10 days post admission when the patient manifested symptoms consistent with ASD, characterized by anxiety, tearfulness, insomnia, panic attacks, low mood, depression and irritable outbursts. He refused radio and television connections, was agitated by nursing staff opening curtains in his room, and refused all visitors - except his immediate family. He described depersonalization and derealization experiences, was uncooperative with medical and nursing interventions, and he had limited interaction with hospital staff.

He developed nightmares about escaping the burning nightclub, and thrashed around on the bed causing further damage to his wounds. On one occasion, nightmares caused severe distress and disorientation, and he leapt out of bed and fell to the floor, where he maneuvered himself behind the door to prevent anyone from entering the room. After this event, he called for staff continuously, and, for a period, he required nurse specialing through the night. Panic attacks developed due to fear of sleeping and the possibility that nightmares might cause events that damage his wounds. Panic episodes were exacerbated by changes in staff or room allocations and unfamiliar views from hospital windows.

The patient's burn injuries indicated that a neuropathic component to his pain was likely, so amitriptyline was prescribed as an analgesic adjunct prior to the onset of major ASD symptoms. Amitriptyline is a tricyclic antidepressant effective in the management of neuropathic pain, which acts independently of its antidepressant properties. Side effects have been reported with all currently available neuropathic analgesic medications, so they all need careful titration by experienced practitioners (Vu 2004).

Virtual Reality Hypnosis was provided as an adjunct to existing therapy after ASD symptoms began to impact significantly on his recovery and pain management requirements.

Practitioner-guided, clinical hypnosis has an established literature supporting its efficacy in the management of anxiety symptoms (Solomon and Johnson 2002). The case study reported here is

the first description of clinical hypnosis in a virtual reality environment being used in the treatment of ASD.

In virtual reality environments, patients have a perception of being immersed in a “safe zone”, where limited auditory and visual stimulation from the “real world” creates a stress free environment conducive to relaxation and altered states of consciousness.

Hypnosis in a virtual reality environment (Figure 1) comprises hypnotic language patterns, auditory rhythms corresponding to alpha brain wave frequencies, and visual images. Visual images are potent tools for distracting the conscious mind, and they reduce conscious, critical analysis of verbal suggestions. In the system developed by Virtual Medicine, visual images are used as subliminal metaphors to reinforce verbal suggestions. Visual images are also used in isolation or coordinated with hypnotic language patterns and auditory signals to deepen trance states and deliver therapeutic suggestions through the application of recognized hypnotic principles, including imagination, association, repetition, pleasure, fixation of attention, anchoring and imbedded commands (Carbis and Mastropaolo 2002; Ledochowski 2003).

On the first day of treatment, Virtual Reality Hypnosis was provided at 1600 and 2000 hours, and after the second session he slept for several hours without nightmares or recall of dreams. The following morning, his dread, tachycardia, hyperventilation, sweating and other panic related symptoms had subsided, and his requirements for burn pain analgesia were managed at reduced levels.

The patient was fearful that nightmares and insomnia might return without treatment, so he asked for Virtual Reality Hypnosis therapy the following evening. On the third evening (21 days post explosion), he felt confident to try night sleep without Virtual Reality Hypnosis treatment, and he successfully slept through the night without nightmares or clinical signs of panic the following day. Staff and patient reports indicated that analgesia requirements and clinical signs of ASD rapidly improved in the period following treatment with Virtual Reality Hypnosis.

Thirty-two days after the Bali explosion (11 days post Virtual Reality Hypnosis treatment), the patient overheard nursing staff raising concerns about the progress of his wounds during routine dressing changes. The patient’s catastrophic interpretation of these comments manifested in depressive thoughts, and during sleep that evening his nightmares returned. He woke screaming in fear of losing his legs. Once again, he had visions of the walls caving in, and experienced dread, tachycardia, hyperventilation and tightness in his chest. The patient used self-directed suggestions for relaxation, but his attempts to emulate the Virtual Reality Hypnosis experience were unsuccessful. Virtual Reality Hypnosis treatment was provided the following evening. After treatment, the patient slept without nightmares, and symptoms of ASD were largely absent the following morning (Figure 2). His previous success and positive approach to Virtual Reality Hypnosis seemed to further enhance the efficacy of treatment. The patient became mobile 34 days post burn, and, for the remainder of his hospital stay, he made rapid progress without ASD related symptoms. The patient was discharged from hospital 43 days after the Bali bombing, and there were no signs of PTSD or related co-morbidities two years after his discharge from hospital.

According to the patient, Virtual Reality Hypnosis prevented insomnia, panic episodes and nightmares, and helped him to overcome feelings of depression. Staff reported reduced analgesic requirements and reduced patient calls for nursing assistance. Sequential psychiatric assessment revealed reduced symptoms of anxiety, panic and negative cognitions, and, according to studies by Bryant *et al.*, (2003), it's reasonable to assume that the early recognition and treatment of ASD in this patient may have prevented the subsequent development of chronic PTSD.

The case study described in this report highlights the importance of identifying and managing ASD, and indicates that Virtual Reality Hypnosis may provide an opportunity for simultaneous delivery of multiple therapies in burns units and similar multidisciplinary environments where medical procedures (e.g. dressing changes) may provoke stress disorders.

In a multidisciplinary setting, where due consideration is given to infection control issues and patients are screened for contraindications (e.g. personality disorders and active psychosis), Virtual Reality Hypnosis is extremely safe, time efficient, economical, and the compact, head mounted display makes it possible to treat patients in acute monitoring environments. Virtual Reality Hypnosis complements pharmacotherapy in pain management, and provides standardized therapy that allows for study of treatment efficacy.

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**Caption for Figure 1:**

Patient receiving Virtual Reality Hypnosis treatment.

**Caption for Figure 2:**

Symptoms of ASD were treated after visiting hours in the evenings between 8.00 and 9.00 pm. After treatment, the head-mounted display was removed, and the patient was left undisturbed for the rest of the night. The patient was asked to rate anxiety and pain on a scale from 0 to 10, where 0 refers to no pain and 10 refers to the most severe pain experience (Figure 2). The treatment schedule was determined by patient and/or hospital staff requests.

**Conflict of Interest Statement**

Colin Carbis is an employee of Virtual Medicine Pty Ltd, which supplied the Virtual Reality Hypnosis device for clinical trial purposes. Colin Carbis provided technical information on hypnosis in virtual reality environments and supervised the operation of this device within the hospital.

**Sources of Funding**

This study was not funded. Virtual Reality Hypnosis equipment was provided on loan from Virtual Medicine Pty Ltd.

**Ethical Approval**

The patient was provided with standard treatment, and medications were not withheld. Virtual Reality Hypnosis was offered as complimentary therapy, so ethical approval was not required.