

# Nursing Care of Posttraumatic Stress Disorder After Anesthesia Awareness

Marlene Rankin, PhD, APRN,BC  
Carrie Carretta, MSN, RN  
Anna Jaroszynski, RUHS

**A**nesthesia awareness can cause adverse psychological symptoms in patients after surgery. Although rare, posttraumatic stress disorder (PTSD) has been documented in surgical patients who have a history of previous trauma or maladaptive coping patterns. Plastic surgical nurses should assess all patients for anesthesia awareness postoperatively, recognize the diagnostic criteria of PTSD, and offer support of psychiatric referrals if indicated.

Surgery may induce a complex set of psychological symptoms, possibly reflecting the additive effects of previous traumas or maladaptive coping patterns leading to escalated levels of anxiety, feelings of powerlessness, and defensive outbursts of behavior. Anesthesia awareness is a significant concern of surgery patients and, though rare, can cause psychological sequelae ranging from severe anxiety, helplessness to chronic fear (Lennmarken, Bildfors, Enlund, Samuelsson, & Sandin, 2002). The prediction, treatment, and management of normal postoperative anxiety are integral parts of the practice of plastic surgery. However, unintended intraoperative

patient awareness can be a disruptive, devastating, and even litigious event for the patient and plastic surgical team. A clinically significant posttraumatic stress disorder (PTSD) should be promptly identified by the surgical team because it often requires consultation and referral to a psychiatrist or mental health professional for further evaluation and treatment. The purpose of this article is to (1) provide specific diagnostic criteria for identifying posttraumatic stress disorder after anesthesia awareness, (2) present nursing interventions that are appropriate for surgical patients with PTSD, and (3) discuss criteria for referral to a mental health specialist or psychiatrist.

## POSTTRAUMATIC STRESS DISORDER

The essential feature of PTSD is the development of characteristic symptoms following exposure to an extremely traumatic stressor involving direct personal experience that involves threatened death or serious injury or a threat to one's physical integrity. The primary symptom of PTSD is significant anxiety and should be differentiated from other anxiety reactions or disorders (Table 1). A patient's psychosocial history may reveal life experiences that increase the probability of developing a PTSD reaction after surgery. Examples include traumatic events that are experienced directly such as military combat, violent personal assault, automobile accidents, childhood sexual assault, torture, or natural disasters (Table 2). An emotional stimulus triggers the traumatic event that is then reexperienced or relived in many ways. Symptoms include intrusive and recurrent recollections of the event, nightmares and distressing dreams, flashbacks or a feeling that

---

**Marlene Rankin, PhD, APRN,BC**, is clinical associate professor at Rutgers College of Nursing since 1992. She earned her PhD and master of science in nursing degrees at Texas Women's University College of Nursing and master's degree at Johns Hopkins University.

**Carrie Carretta, MSN, RN**, is a consultant in Psychiatric Mental Health nursing. She earned both her BSN and MSN from Rutgers University.

**Anna Jaroszynski, RUHS**, is an undergraduate Senior Honors Scholar at Rutgers University and will graduate May 2008.

Address correspondence to Marlene Rankin, PhD, APRN,BC, Rutgers College of Nursing, 180 University Ave, Newark, NJ 07102 (e-mail: mrankin@rutger.edu).

**TABLE 1 DSM-IV Criteria for Panic Attack, Posttraumatic Stress Disorder, and Acute Stress Disorder**

<b>Panic attack</b> (4 or more symptoms present, <i>sudden onset peak in 10 min</i> )	<b>Posttraumatic stress disorder</b> (symptoms can be <i>immediate or delayed for years</i> , stressors trigger at least 3 symptoms)	<b>Acute stress</b> (symptoms occur <i>immediately, end within 4 weeks</i> ; 3 or more symptoms present for 2 days) Diagnosis changes to PTSD after 4 weeks.
Palpitations sweating	Experienced an event that caused severe threat to self	Exposure to a traumatic event involving threat to self
Trembling/shaking	Detachment	Moderate anxiety
Shortness of breath	Response of intense fear, helplessness, or horror	Response of intense fear, helplessness, or horror
Feeling of choking	Startle reflex	Amnesia
Chest discomfort	Recurrent thoughts or nightmares	Detachment/daze
Nausea	Flashbacks	Recurrent dreams
Feelings of unreality	Intense distress	Flashbacks
Fear of losing control	Physiological reactivity to symbolic cue	Irritability
Fear of dying	Avoidance of cues associated to trauma	Poor concentration
numbness	Symptoms of arousal	Avoidance of triggers/recollections of trauma
chills	Sleep disorder	Clinical distress, impairment in functioning
Hot flushes	Hypervigilance	Depersonalization
Gastrointestinal upset		

the traumatic event is recurring, physiological reactions, and intense psychological distress, mainly evidenced as anxiety and depression (Sadock & Sadock, 2007).

In general, life experiences that are accompanied by strong emotional arousal are replayed in thoughts more extensively and intensively than experiences of lesser or neutral emotional tone. The legacy of a severe traumatic event and its unexpected occurrence appears to alter the physiologic stress response. There is a pattern of hypervigilance or constant arousal, a fight/flight response regardless of whether an actual threat is present or not.

Community-based studies reveal a lifetime prevalence for PTSD ranging from 1% to 14% with the variability related to methodology and the population sampled. Studies of at-risk individuals such as combat veterans and victims of criminal violence show rates ranging from 3% to as high as 58% (American Psychiatric Association, 1994; Sadock & Sadock, 2007). PTSD can arise from previous sexual abuse, and several researchers have conducted interviews with adults to obtain retrospective reports of the prevalence of childhood sexual abuse. It is generally believed that childhood histories of trauma can predispose patients to the subsequent reemergence of psychological distress. There is evidence that parental PTSD is a relevant risk factor. Offspring of trauma survivors with PTSD show significantly lower 24-hr mean urinary cortisol excretion as well as enhanced plasma cortisol suppression than offspring of survivors

without PTSD (Yehuda & Bierer, 2007). Women patients may be viewed as an “at risk” group with regard to PTSD. The “crisis” of surgery with the feeling of “not being in control” can unconsciously reactivate previous symptoms or triggers of PTSD and cause significant distress in female surgery patients, especially those who may have dependent or borderline personality traits.

The most empirically supported treatment approach for PTSD is to maintain adaptive coping skills through cognitive-behavioral therapy and stress management through intervention (Bisson & Andrew, 2007). Illustrative intervention strategies include relaxation training, biofeedback, eye

**TABLE 2 Risk Factors Associated With Posttraumatic Stress Disorder**

Presence of childhood trauma
Borderline or dependent personality traits
Inadequate social support system
Female gender
Recent stressful life event
Previous trauma: war, bioterror, accident, rape, natural disaster
History of alcohol and substance abuse
Age: elderly or young
Stress factors such as poverty, homelessness, or unemployment
History of psychiatric disorders
Parental history of posttraumatic stress disorder

movement desensitization reprocessing, positive self-talk, or systematic desensitization in which the patient relaxes while visualizing increasingly stressful stimuli to cope with anxiety. Family and social support can be critical, because research shows that adequate social support is associated with positive psychological well-being and that it acts to buffer stress. Lack of social support has been shown to aggravate feelings of helplessness and hopelessness in individuals with PTSD, especially when coping responses are overwhelmed by subsequent stressors. Moreover, persons who have traumatic life experiences frequently struggle with feelings of self-blame and diminished self-worth. Most of the treatment approaches in the psychiatric literature focus on the need to review and reprocess the traumatic event that was experienced. Pharmacologic treatment of PTSD is generally not recommended unless there is evidence of more advanced psychopathology or a major depressive episode. The plastic surgery team, who identifies PTSD in the postoperative period, should assign one specific team member to reassure the patient and make early referral to a mental health professional. Facilitating adaptive coping behaviors through patient education and support is critical to reduce cognitive distortions and empower the patient.

What distinguishes posttraumatic stress disorder from other types of anxiety disorders is that the patient reexperiences a terror of the past trauma as if it was happening again and again. The source of PTSD or the past trauma is out of the scope of every day experiences. Examples of such occurrences include any type of sexual abuse, bioterror, military combat, prisoner of war, natural disasters, such as floods, tornadoes, and earthquakes, man-made disasters, bombings, or diagnosis of life-threatening disease. In addition, the traumatizing event endangered one's life to the point that the person has learned to respond with anxiety to any type of stimulus that triggers reminders of the original trauma (a Classically Conditioned Response). For example, a patient becomes anxious only after witnessing blue scrub suits because it is reminder of her surgical trauma, which caused her anxiety in the first place (Salomons, Osterman, Gagliese, & Katz, 2004). Studies at Massachusetts Institute of Technology's Picower Institute for Learning and Memory in conjunction with the Hughes Medical Institute have identified that Cdk5, a chemical produced in the hippocampus of the brain, may hold responsibility for reinforcing debilitating fear following a traumatic event. In this study, inhibition of Cdk5 in the hippocampus facilitated extinction of the contextual fear, while upregulation caused severe impairment or rekindled the neuronal pathways of the brain (Sanabenesi et al., 2007).

The *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994) describes key manifestations of PTSD. Symptoms may include exposure to a traumatic event that threatens the integrity of self, persistent reexperiencing of the traumatic event through repetitive distressing recollections or dreams, irritability, difficulty concentrating, hypervigilance and depersonalization. Individuals with PTSD report diminished occupational and social functioning. In terms of population parameters, PTSD affects about 7.7 million American adults (Kessler, Chiu, Demler, & Walters, 2005). Gender-wise, women are more than twice as likely as men to be affected by PTSD even though men have a higher probability of exposure to traumatic events (Ebert, Loosen, & Nurcombe, 2000; Margolin & Gordis, 2000).

## PTSD AFTER ANESTHESIA AWARENESS

---

Under normal circumstances general anesthesia causes significant memory suppression, patients do not have any recall of events either during or directly after the procedure (Rasmussen, 2007). Awareness under general anesthesia is a state of consciousness resulting from inadequate anesthetic blood levels to provide the desired state of unconsciousness (Salomons et al., 2004). Different surgical procedures including ophthalmic, orthopedic, abdominal, head and neck, gynecologic, and thoracic surgeries have reported anesthesia awareness (Sebel et al., 2004). Anesthesiologists face the dilemma of overmedicating patients (especially in same-day surgical facilities) or limiting the amount of administered anesthesia, which may lead to aesthetical awareness. Additional problems result with anesthesia administration in special patient populations such as drug abusers, where requirements could be substantially increased (Rasmussen, 2007). Generally, patients who experienced incomplete anesthetic states complain about increased pain, feeling unsafe or terrorized, and hearing doctors and nurses conversing (Osterman, Hopper, Heran, Keane, & Van Der Kolk, 2001).

This state of consciousness during surgery is not a time-limited experience to the patient's stay at the hospital. Signs and symptoms of PTSD as a result of surgical awareness may develop shortly (within hours) or a long time after the surgery. In the study conducted by Osterman et al. (2001), "most of the patients who suffered awareness during anesthesia had described recalling fragments of their surgery in nightmares during which they re-experience paralysis, pain, or conversations between surgical personnel. Patients reported avoidant behaviors such as refusing hospital care and physician visits and evading television programs with hospital

themes” (p. 198). Lennmarken et al. (2002) reported in a prospective study that the experience of intraoperative awareness increased patients’ avoidance rather than seeking help for their distress.

Of 21 million patients administered general anesthesia, approximately 20,000 to 40,000 patients or 0.4% of the population reported anesthesia awareness (“JCAHO,” 2004; Samuelsson, Brudin, & Sandin, 2007). These numbers might be underreported for some patients fail to discuss the aesthetical awareness as they are either too embarrassed, dismiss their experience as a nightmare, or think that it is not worth doctors’ attention. In a prospective, nonrandomized descriptive cohort study at seven academic centers in the United States, Sebel et al. (2004) found incidence of awareness comparable to that described in other countries. Data collected from 19,575 patients yielded in incidence of 0.13%. In addition, similarly to PTSD, awareness under anesthesia is also more prevalent in women than in men. According to Sigalovsky (2003), “The American Society of Anesthesiologists reported that the awareness under general anesthesia was observed more commonly in women (77%) with a higher prevalence in adults younger than sixty years (89%)” (p. 374). It is also reported that awareness is more likely among patients who are obese and are long-term users of alcohol, sedatives, or narcotics (Ghoneim, 2007). In the study conducted by Osterman et al. (2001), patients expressed terror, loneliness, and feelings of betrayal and pain. Salomons et al. (2004) reported patient descriptions of terror, pain, and an overwhelming desire to flee.

Not all anesthesia awakening has negative effects and dreaming must be separate from anesthesia awareness. Dreaming during anesthesia is defined as any recalled experience (excluding awareness) that occurred between induction and the first moment of consciousness upon emergence. Dreaming may be related to a lighter depth of anesthesia. Skrzypek, Paech, Kurowski, and Whybrow (2007) reported that dreaming after surgery occurred in 22% of patients on emergence. Dreamers tend to be younger and male, to receive propofol maintenance or regional anesthesia and to open their eyes sooner after surgery. These patients may have risk factors for anesthesia awareness, and the near miss may have been prevented by depth of anesthesia monitoring (Table 3). Most dreams were similar to dreams of sleep and the content was unrelated to surgery. Dreaming in adult surgery patients is a common, fascinating, usually pleasant and harmless phenomenon. In almost all cases, the content of dreams related to work family and recreation, with no correlation to the depth of anesthesia (Skrzypek, 2007).

**TABLE 3 Risk Factors Associated With Anesthesia Awareness<sup>a</sup>**

Beta and calcium blockers
Type of surgery
Acute physical trauma (falls, accidents)
Unexpected intraoperative complications
Abuse of benzodiazepines or opioids
Severe systemic disease
Equipment failure
Hypovolemia
Central nervous system depressants
Obesity

<sup>a</sup>From “Anesthesia Awareness,” by R. Springer, 2006, *Plastic Surgical Nursing*, 26(2), p. 9697; and “Incidence of and Risk Factors for Awareness During Anesthesia,” by M. M. Ghoneim, 2007, *Best Practice Research Clinical Anesthesiology*, 21(3), pp. 327–343.

## PLASTIC SURGICAL NURSING INTERVENTIONS

Clinical nursing interventions are organized, specific nursing practices that provide support, reassurance, safety, and comfort to the patient, thereby decreasing psychological anxiety, stress, and helplessness. The plastic surgical nurse must be cognizant of the patient’s crisis situation and intense underlying anxiety. Initial psychosocial interventions include effective and accurate risk assessment, communication, management of acute abnormal psychological and somatic symptoms, and an environment that supports postoperative recovery and realistic client response outcomes. Springer (2006) recommended that nurses assess all patients for awareness postoperatively by eliciting information regarding the last memory before anesthesia and first memories when awakening. JACHO (2004) guidelines include interviewing the patient, offering psychiatric support and referrals, and notifying the patient’s surgeon, nurse, and anesthesiologist.

Specific independent nursing measures should include support, providing a nonthreatening environment, discussion of feelings, and education about specific coping strategies (Table 4). Long-term functional outcomes from anesthesia awareness will be determined by the patient’s health, developmental level, resources, and experiences. Factors that influence psychological outcomes include interpersonal strengths, fear of pain and discomfort, uncertainty about final outcomes, loss of control, disruption of life pattern and the patient’s previous healthcare experiences, and hospitalizations. Positive and negative responses of family members’ healthcare experiences may make some individuals more at risk.

Careful questioning and psychosocial assessment can reveal, early on, those patients who are at

**TABLE 4 Plastic Surgical Nursing Interventions for Managing Early Posttraumatic Stress Disorder**

1. Empathize with the patient's feelings in a positive and accepting manner.
2. Discuss with patient perceptions of depersonalization or fear.
3. Provide incremental exposure to social environments and support useful coping strategies.
4. Focus on the patient as a whole.
5. Assist patient in coping with temporary changes such as bruising.
6. Demonstrate a positive, nonjudgmental attitude.
7. Provide consistent emotional support and nonthreatening information.
8. Encourage involvement in self-care.
9. Recognize that uncertainty is a debilitating concept.
10. Nonverbal behavior conveys more important messages than verbal messages; the impact of facial expression is greatest, followed by the impact of vocal expression, and finally the impact of words.

greater risk for psychological problems after surgery. Plastic surgical nurses can assist patients to utilize previously successful coping strategies while adapting to the stressful surgical experience. The most common defense mechanisms patients utilize are denial, repression, rationalization, identification, sublimation, and projection. Coping strategies include worrying, exercise, emotional eating, increased or decreased sleep patterns, seeking information, increased use of drugs, alcohol or nicotine, journal writing, relaxation exercises, reading books or magazines, prayer, social support, and discussion of feelings. The literature supports evidence that walking 20 min three times per week, yoga, soothing music and progressive relaxation increase coping responses. These techniques provide patients with a sense of control and decrease their emotional reactivity. Individualized reassurance and support for the at-risk patient with ready access to an identified member of the plastic surgery team should be part of the overall management for these patients.

The surgical nurse must be cautious about conversations in the surgical area. The patient may be able to hear what is going on but unable to clarify or interpret what is heard altering perceptions. A patient who has been medicated receives IV sedation, or who is undergoing or emerging from anesthesia may be influenced by physical restraint, sensory overload or deprivation, and specific effects of drugs. Many surgical patients have initial transient psychological disturbances during the early postoperative period because of the change in appearance, uncertainty about the outcome of surgery, reactions of significant others, and sensory or functional impairment related to edema.

The long-term management of PTSD is beyond the usual scope of postoperative care for the plastic surgical team. It is imperative that the patient be referred to a psychiatrist or mental health professional for further evaluation to limit adverse experiences and to promote their emotional well-being. Treatment of PTSD usually includes cognitive, behavioral, and occasionally drug therapies. The most widely studied drugs for PTSD are the selective serotonin reuptake inhibitors (SSRIs), which improve symptoms in about 50% of patients (Schatzberg, Cole, & DeBattista, 2005; Stein, Lerer, & Stahl, 2005). PTSD is rarely a patient's only psychiatric diagnosis, and it is sometimes difficult to distinguish overlapping independent symptoms from effects of the trauma. Nearly half of all people with PTSD also suffer from comorbid depression and more than a third from phobias and alcoholism. PTSD is a highly prevalent and impairing condition (Moore & Jefferson, 2004). Patients with delayed PTSD who become depressed may become profoundly negative and pessimistic with diminished concentration. Self-medicating with alcohol, sleeping medications, or requests for additional pain medications is common.

Plastic surgical patients who perceive their nurses as concerned and caring are better prepared to deal with the stress during the recovery phase. They report fewer vague complaints, feelings of disappointment, expressions of anger, and hostility, and are more satisfied with their plastic surgery outcomes (Borah, Rankin, & Wey, 1999). The literature supports the phenomena of plastic surgical patients masking or keeping secret their concerns, which may then be manifested by physical complaints (Rankin & Borah, 2006). Avoidance is a well-known behavior in patients with stress disorders, and anesthesia awareness often leads to dissatisfaction (Samuelsson et al., 2007). Plastic surgery nurses can mediate the effects of anesthesia awareness by encouraging sufficient rest and sleep while normalizing eat-sleep-work cycles, talking through the patient's initial emotions, supporting previously successful coping strategies and a gradual return to daily activities. Re-entry into social roles when appropriate is an important part of the recovery process. Patients who are diagnosed with long-term, complex PTSD should be referred to a psychiatrist or mental health specialist for evaluation and treatment.

## REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Bisson, J., & Andrew, M. (2007, July 18). Psychological treatment of post-traumatic stress disorder (PTSD). *Cochrane Database System Review*, (3), CD003388.

- Borah, G. L., Rankin, M., & Wey, P. D. (1999). Psychological complications in 281 plastic surgery practices. *Plastic and Reconstructive Surgery*, 104(5), 1241–1246.
- Ebert, M. H., Loosen, P. T., & Nurcombe, B. (Eds.). (2000). *Current diagnosis & treatment in psychiatry*. New York: McGraw-Hill.
- Gajwani, P., Muzina, D., Gao, K., & Calabrese, J. R. (2006). Awareness under anesthesia during electroconvulsive therapy treatment. *Journal of ECT*, 22(2), 158–159.
- Ghoneim, M. M. (2007). Incidence of and risk factors for awareness during anesthesia. *Best Practice Research Clinical Anesthesiology*, 21(3), 327–343.
- JCAHO: Awareness during anesthesia is a problem. (2004). *Healthcare Risk Management*, 26(12), 137–139.
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry*, 62(6), 617–627.
- Landolt, M. A., Boehler, U., Schwager, C., Schallberger, U., & Nuessli, R. (1998, December). Post-traumatic stress disorder in paediatric patients and their parents: An exploratory study. *Journal of Paediatrics and Child Health*, 34(6), 539–543.
- Lenmarken, C., Bildfors, K., Enlund, G., Samuelsson, P., & Sandin, R. (2002). Victims of awareness. *Acta Anaesthesiologica Scandinavica*, 46(3), 229–231.
- Leslie, K., & Skrzypek, H. (2007). Dreaming during anesthesia in adult patients. *Best Practice Research Clinical Anesthesiology*, 21(3), 403–414.
- Leslie, K., Skrzypek, H., Paech, M. J., Kurowski, I., & Whybrow, T. (2007). Dreaming during anesthesia and anesthesia depth in elective surgery in patients. *Anesthesiology*, 106(1), 33–42.
- Margolin, G., & Gordis, E. B. (2000). The effects of family and community violence on children. *Annual Review of Psychology*, 51, 445–479.
- Moore, D. P., & Jefferson, J. W. (2004). *Handbook of medical psychiatry* (2nd ed.). Philadelphia: Mosby-Elsevier
- Osterman, J. E., Hopper, J., Heran, W. J., Keane, T. M., & Van Der Kolk, B. A. (2001, July/August). Awareness under anesthesia and the development of posttraumatic stress disorder. *General Hospital Psychiatry*, 23(4), 198–204.
- Rankin, M., & Borah, G. (2006, October/December). Psychological complications: National plastic surgical nursing survey. *Plastic Surgical Nursing*, 26(4), 178–183.
- Rasmussen, L. S. (2007). Anaesthesia and amnesia. *Acta Anaesthesiologica Scandinavica*, 51(8), 966–967.
- Sadock, B. J., & Sadock, V. A. (2007). *Kaplan and Sadock: Synopsis of psychiatry* (10th ed.). Philadelphia: Lippincott, Williams & Wilkins.
- Salomons, T. V., Osterman, J. E., Gagliese, L., & Katz, J. (2004, March/April). Pain flashbacks in posttraumatic stress disorder. *The Clinical Journal of Pain*, 20(2), 83–87.
- Samuelsson, P., Brudin, L., & Sandin, R. H. (2007). Late psychological symptoms after awareness among consecutively included surgical patients. *Anesthesiology*, 106, 26–32.
- Sananbenesi, F., Fischer, A., Wang, X., Schrick, C., Neve, R., Radulovic, J., et al. (2007). A hippocampal Cdk5 pathway regulates extinction of contextual fear. *Nature Neuroscience*, 10(8), 1012–1019.
- Schatzberg, A. F., Cole, J. O., & DeBattista, C. (2005). *Manual of clinical psychopharmacology* (5th ed.). Washington, DC: American Psychiatric Publishing.
- Sebel, P. S., Bowdle, T. A., Ghoneim, M. M., Rampil, I. J., Padilla, R. E., Gan, T. J., et al. (2004). The incidence of awareness during anesthesia: A multicenter United States study. *Anesthesia and Analgesia*, 99, 833–839.
- Sigalovsky, N. (2003, October). Awareness under general anesthesia. *AANA Journal*, 71(5), 373–379.
- Springer, R. (2006). Anesthesia awareness. *Plastic Surgical Nursing*, 26(2), 9697.
- Stein, D., Lerer, B., & Stahl, S. (2005). *Evidence based psychopharmacology*. New York: Cambridge University Press.
- Yehuda, R., & Bierera, L. M. (2007). Transgenerational transmission of cortisol and PTSD risk. *Progress in Brain Research*, 167, 121–135.
- Your patients' worst nightmare and yours: Awareness despite anesthesia. (1998, December). *Same-Day Surgery*, 22(12), 149–151.