

# Psychological Issues in Diving

MEDICAL LINE



*How Anxiety, Phobias and Panic Attacks Can Affect Our Recreation*

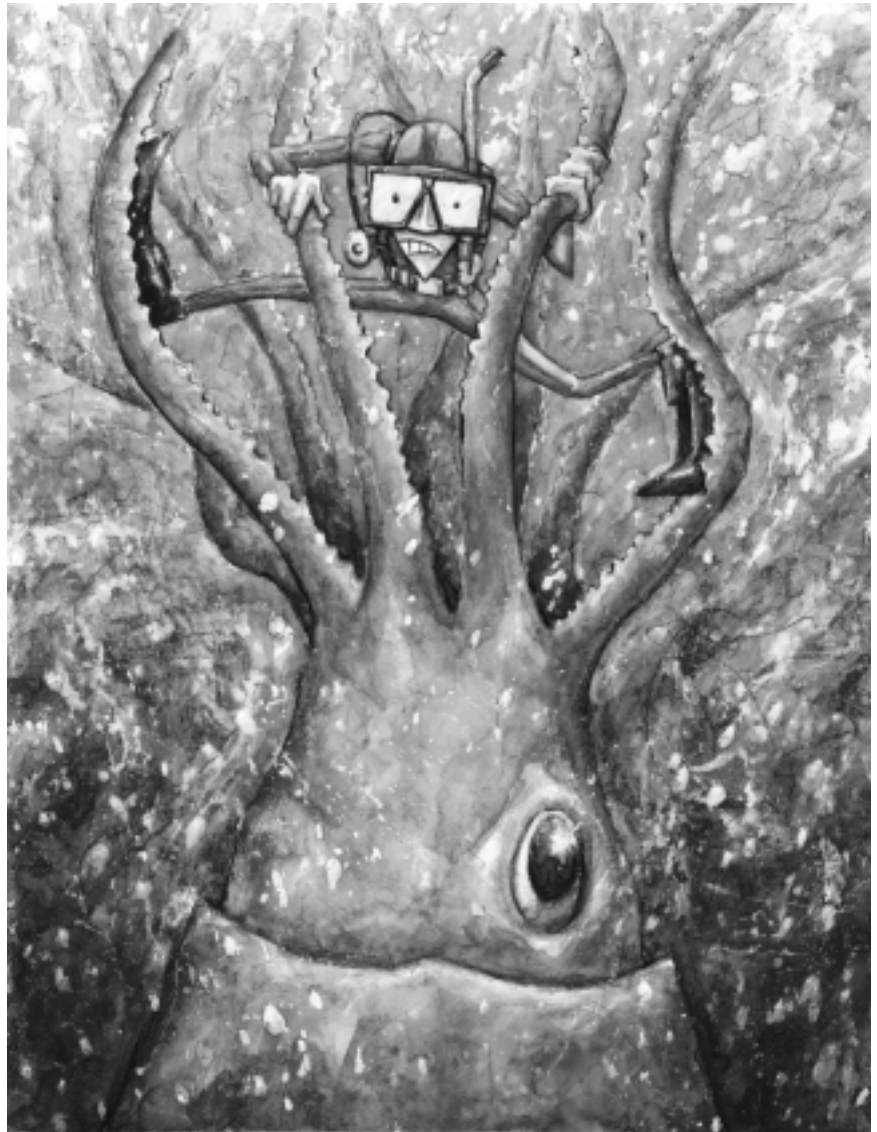
*By Ernest Campbell, M.D.*

This is the first of three articles addressing psychological issues and their relationship to scuba diving. This article looks at anxieties, phobias, panic and narcolepsy; the second deals with depression and manic-depression; and the third installment addresses schizophrenia, marijuana and alcohol use. Each section examines causes, symptoms, advice about diving and medications used for a particular disorder or habit.

## ANXIETY

Anxiety is a normal human emotion we all experience when we face threatening or difficult situations. Associated with the secretion of catecholamines (adrenalin), fear or anxiety can help us avoid dangerous situations or get out of them. It can make us alert and it can spur us to deal with a threat or other problem rather than simply avoiding it (i.e., the “fight or flight” reaction). However, if feelings of foreboding become too strong or last too long, they can hold us back from many normal activities.

In abnormal situations, anxiety is manifested by apprehension and dread, though it cannot be attached to a clearly identifiable stimulus. Anxiety can be accompanied by worried feelings, tiredness, tension, restlessness, loss of concentration, irritability and insomnia. The physical effects of anxiety can range



from irregular heartbeat, sweating, muscle tension and pain, heavy, rapid breathing, dizziness, faintness, indigestion and diarrhea, and they're produced by the effects of increased adrenalin.

People who are experiencing extreme anxiety can often mistake these signs and symptoms for evidence of serious physical illness, and worry about this can aggravate the symptoms.

A more intense form of anxiety is panic, a sudden, unexpected but powerful surge of fear. Panic can cause a wholesale flight from the immediate situation, a reaction that is especially dangerous for scuba divers. A diver who experiences panic at depth is subject to near-drowning, lung overexpansion injuries and death.

In susceptible people a heightened awareness of potential but definite dangers, complicated by a normal anxiety of being underwater, can cause a phobic anxiety state. The diver may then develop an actual fear of descending into the water. Some divers experience this while learning to dive, but other stronger motivating factors - finishing the class, spousal, parental or peer approval, an unwillingness to appear fearful to anyone else - can temporarily override their fears.

An overreactive anxiety state usually occurs in response to a mishap, such as a dive mask flooding with water. This may cause the diver to panic unnecessarily and behave irrationally. Often, this results in emergency ascents with the attendant dangers, frantic grabs for air supplies and lack of concern for the safety of others. This reaction is seen more often in those divers who have an above-normal tendency toward anxiety.

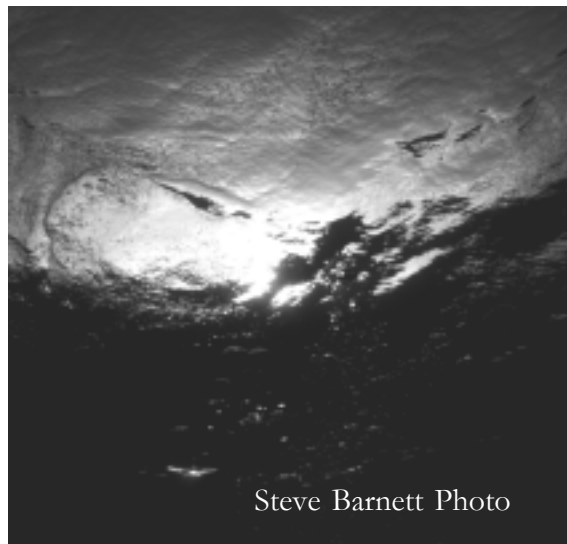
## PHOBIAS

A phobia is an objectively unfounded fear, an anxiety about particular situations or things that are not dangerous and which most people do not find troublesome. People with phobias have the intense signs of anxiety - e.g., irregular heartbeat, sweating, dizziness, etc., described above.

Phobias arise only from time to time, however, in particularly frightening situations. At other times, those who experience phobias don't feel anxious. If you have a phobia of dogs, you'll feel OK if there are no

dogs around; if you are scared of heights, you're OK at ground level; and if you can't face social situations, you will feel calm when there are no other persons around.

A phobia will lead sufferers to avoid situations they know will provoke anxiety, but this will actually worsen the phobia as time goes on. It can also mean that the phobic person's life becomes increasingly dominated by the precautions taken to avoid the



Steve Barnett Photo

situation feared. Phobic individuals usually know that no real danger exists; they may note that they feel silly about their fears, but, still, they cannot control them. Notably, a phobia is more likely to fade away if it began after a distressing or traumatic event.

About one in every 10 persons will have troublesome anxiety or phobia at some point in life. However, most will never ask for treatment. Some divers have true claustrophobia, preventing their immersion into water or their entry into a recompression chamber. This syndrome may surface only during certain times of stress and

diminished visibility, such as in murky water, during night diving or during prolonged diving. This has no one cure, but treatments such as exposure therapy (see the website: <http://phobialist.com/treat.html>) expose the individual to the situation most feared. The two most popular forms of this therapy are "slow desensitization" and "flooding." Flooding is a rapid and more intense form of desensitization, without the relaxation techniques used in slow desensitization.

Through these treatments, phobia sufferers receive direct exposure to the fear until the anxiety subsides. One can imagine such direct exposure or can actually confront the phobia's trigger, the latter a dangerous method of treatment in the underwater setting.

An agoraphobic reaction in diving, often called blue orb or blue dome syndrome, is what a phobic diver can experience when he or she loses contact with both the bottom and the surface and becomes spatially disoriented.

Sensory deprivation - e.g., limited visibility, murkiness, loss of spatial orientation - can also cause illusions, particularly when visibility is impaired. Anxiety associated with this environment can cause heightened suggestibility and result in mistaking fish, other divers and objects for sharks or other threatening entities.

## PANIC DISORDERS

Recent studies suggest that episodes of panic or near-panic may explain many recreational diving accidents and the cause of some diving fatalities. Evidence also shows that individuals who have a high level of underlying anxiety are more likely to have greater responses when exposed to stresses, and, hence, this sub-group of the diving population will experience an increased level of risk. In a recent national survey, more than half of divers reported experiencing at least one panic or near-panic episode.

Panic attacks are often spurred by something that a non-diver would deem serious - entanglement, an equipment malfunction or being startled by some unexpected sea creature. These panic attacks can lead to irrational behavior. If divers and instructors knew more about the phenomenon, perhaps they could screen divers who might be susceptible to life-threatening panic attacks.

Panic attacks are not restricted to beginning divers; experienced scuba divers with hundreds of logged dives sometimes experience panic for no apparent reason. In such cases, it is believed that panic occurs because divers lose sight of familiar objects, become disoriented and experience sensory deprivation. However, among inexperienced divers, panic generally results from a specific reason, such as a loss of air or an encounter with a shark.

Panic can occur when divers reacts quickly but irrationally: their attention narrows, and they lose the

ability to sort out options. If, for example, a problem develops with the regulator, the restricted air flow could prompt a panicked diver to ascend rapidly enough to cause an often-fatal arterial gas embolism (bubble) in the bloodstream. This would be considered a panic response if the diver had other safe options, such as access to a pony bottle (an emergency air supply) or was diving with others who could share their air supply, allowing a gradual ascent.

Some diving activities inevitably lead to anxiety: the stresses of equipment malfunctions, dangerous marine life (e.g., sharks), loss of orientation during cave dives, under-ice or wreck penetration dives, and other stress-laden situations. Diving with faulty or inappropriate equipment or performing high-risk dives has a greater potential to cause panic episodes; with appropriate training and cautionary actions, however, we can prevent or minimize these problems.

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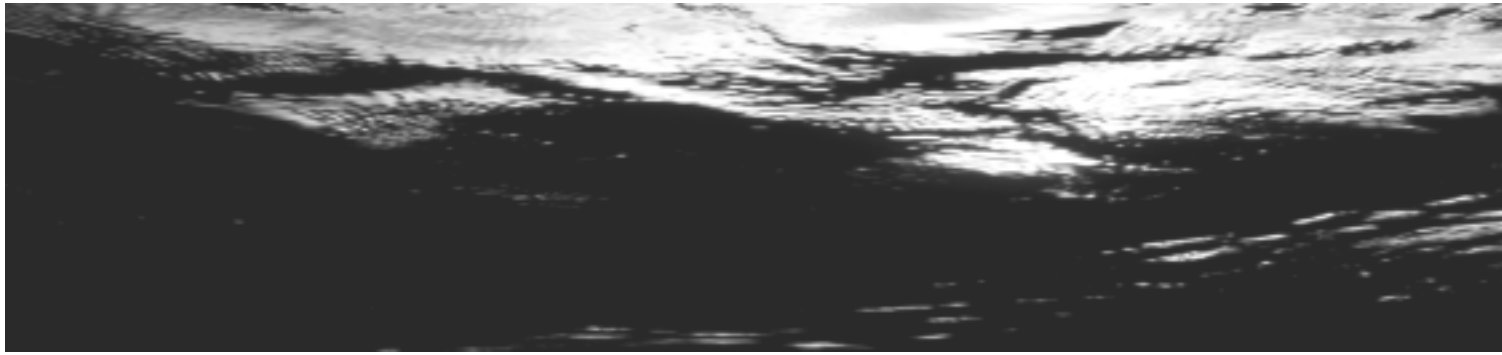
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### *Trait Anxiety Versus State Anxiety*

Trait anxiety is a psychological phenomenon regarded as a stable or enduring feature of personality; state anxiety is situational, or transitory. Individuals who score high on measures of trait anxiety are more likely to have an increased state of anxiety and panic during scuba activities, and they are at potentially greater risk than those scoring in the “normal” range.

Many dive physicians feel that such individuals probably should not dive. It has been found that interventions such as biofeedback, hypnosis, imagery and relaxation have not been effective in reducing anxiety responses associated with panic attacks. Psychological research has shown that hypnosis is effective in relaxing scuba divers, but it can also have the undesired effect of increasing heat loss in divers. Relaxation can lead to increased anxiety and panic attacks in some



highly anxious individuals (this is known as relaxation-induced anxiety, or RIA). Individuals with a history of high anxiety and panic episodes should probably be identified if possible and counseled during scuba training classes about the potential risks.

### ***Advice About Scuba Diving***

In determining whether a person with anxiety, phobias and panic attacks should be certified as fit to dive, each case should be evaluated on its own merits, including types of drugs required (if any), response to medication and the amount of time free of anxiety and phobia.

Individuals who score high on measures of trait anxiety most probably should not dive, but, if they choose to dive, they should be carefully monitored and fully informed of the risks, with special consideration to one's decision-making ability and responsibility to other divers.

In all cases, prospective divers should fully disclose their conditions and medications to the dive instructor and certifying agency. They should bear in mind the safety of their potential dive buddies, dive instructors, divemasters and other individuals who are affected by diving incidents.

## **MEDICATIONS**

### ***For Anxiety, Phobias & Panic Disorders***

(Note: Many of the medications listed under "depression" are also used for anxiety. Generic names are listed first; common brand names follow).

#### **Benzodiazepines**

Medications in this group used to treat anxiety include:

Alprazolam / Xanax, Chlordiazepoxide / Librium, Clonazepam / Klonopin, Clorazepate / Tranxene, Diazepam / Valium, Halazepam / Paxipam, Lorazepam / Ativan, Oxazepam / Serax, Prazepam / Centrax.

#### ***Side effects adverse to diving:***

- Drowsiness: A common side effect. Be sure you know how you react to this medicine before driving or using dangerous machinery.
- Dizziness: Be careful about standing up quickly, going up and down stairs and driving.
- Difficulty learning: An unusual side effect, it tends to go away quickly with continued use.

#### **Beta Blockers**

Medications in this group used to treat anxiety include:

Propranolol / Inderol, Pindolol / Visken, Atenolol / Tenormin, Acebutolol / Sectral, Betazolol / Kerlone, Bisoprolol / Ziac or Zebeta, Carteolol / Cartrol, Carvedilol / Coreg,

Labetalol / Normodyne or Trandate, Metoprolol / Lopressor, Nadolol / Corgard or Corzide, Penbutolol / Levatol, Timolol / Blocadren or Timolide.

#### ***Side effects adverse to diving:***

- Drowsiness: A common side effect. Make sure you know how you react to this medicine before driving or using dangerous machinery.
- Dizziness: Be careful about standing up quickly, going up and down stairs, and driving.
- Low blood pressure.
- Slow pulse: Particularly important to divers, as they may not be able to respond to exercise and stress.
- Breathing difficulty, wheezing, cough.
- Dry mouth: Drink plenty of fluids. Chew sugarless gum. Suck on sugarless candy. Pay special attention to dental hygiene (brush and floss regularly).

Patients with asthma or diabetes may develop special side effects while taking these medications. Also, physicians advise their patients to be aware that beta blockers can affect their tolerance to exercise.

*Ed. Note: Regarding divers' use of beta blockers, here are some viewpoints.*

*Dr. Alfred Bove ("Diving Medicine," 3rd Edition, 1997) states the following about beta blockade: "... many cardiovascular drugs can alter exercise tolerance ..."* and

*“Patients using beta-adrenergic blocking medication will demonstrate some inhibition of the heart rate response to exercise.” Dr. Bove also states: “Although the heart rate response is blunted this will rarely interfere with diving, because diving should not provoke maximum work demand.”*

*To Dr. Bove’s last statement Dr. Campbell, author of this article, advises: “There are occasions in which a diver will panic, have an anxiety attack or actually need to exert in dangerous situations and may be unable to have an adequate cardiovascular response.” He adds: “Patients who have experienced adverse drug reactions from beta blockers due to combination therapy with calcium channel blockers or impaired metabolism due to renal or hepatic dysfunction should have their dosages adjusted or medications changed to avoid recurrent complications.”*

*Dosages of beta blockers are not mentioned in Bove. “The usual therapeutic regimen” is mentioned.*

*Dive physician and author Dr. Carl Edmonds in “Diving and Subaquatic Medicine” (1992) cautions: “There should be an awareness of the effects of reduced exercise tolerance and autonomic system blockade,” and “Beta blockers may also have other side effects such as bronchospasm.”*

### **Celexa / Citalopram**

Celexa is used to treat depression, anxiety and obsessive-compulsive disorder.

Possible side effects adverse to diving:

- Anxiety/restlessness: This will usually go away with continued use.
- Drowsiness/dizziness: Avoid driving or working with dangerous machinery until the effect of this medication is known.
- Bruising/bleeding: Use of Celexa can slightly increase risk of bruising and bleeding, but this can be significant when aspirin or non-steroidal anti-inflammatory drugs (e.g., naproxen, ibuprofen, ketoprofen, flurbiprofen, diclofenac, sulfasalazine, sulindac, oxaprozin, salsalate, piroxicam, indomethacin, etodolac) are also taken. Barotrauma to sinuses, ears and lungs may cause significant hemorrhage because of this tendency for bruising and bleeding.

### **Fluoxetine/Prozac**

Fluoxetine is used to treat depression, anxiety, and obsessive-compulsive disorder.

Possible side effects adverse to diving:

- Anxiety / restlessness: Goes away with continued use.
- Tremor: Tends to go away with continued use.
- Bruising/bleeding: Use of fluoxetine can slightly increase risk of bruising and bleeding, but this can be significant when aspirin or non-steroidal anti-inflammatory drugs (e.g. naproxen, ibuprofen,

ketoprofen, flurbiprofen, diclofenac, sulfasalazine, sulindac, oxaprozin, salsalate, piroxicam, indomethacin, etodolac) are also taken.

### **Fluvoxamine/Luvox**

Fluvoxamine is used to treat depressive, anxiety and obsessive-compulsive symptoms.

Possible side effects adverse to diving:

- Anxiety/restlessness: Will usually diminish with continued use. If anxiety causes difficulty, consult with your physician.
- Drowsiness: If this occurs, take this medication one hour before bedtime. Make sure you know how you react to this medicine before you drive or use dangerous machinery. Drowsiness usually diminishes with continued use.
- Tremor: Tends to diminish with continued use.
- Bruising/bleeding: Use of fluvoxamine can slightly increase risk of bruising and bleeding, but this can be significant when aspirin or non-steroidal anti-inflammatory drugs (e.g., naproxen, ibuprofen, ketoprofen, flurbiprofen, diclofenac, sulfasalazine, sulindac, oxaprozin, salsalate, piroxicam, indomethacin, etodolac) are also taken. Bleeding with barotrauma would be a concern.

## NARCOLEPSY

A chronic disorder affecting the part of the brain where regulation of sleep and wakefulness take place, narcolepsy can be viewed as an intrusion by dreaming sleep (REM, or rapid eye movement) into the waking state.

Should people with narcolepsy become certified for scuba diving? No scientific studies exist on the subject: all that is written is pure supposition, based on knowledge of the condition and knowledge of what can happen to the diver with decreased awareness or consciousness.

Some individuals, no matter how much they sleep, continue to experience an irresistible need to sleep - these persons are narcoleptics. People with narcolepsy can fall asleep while working, talking or driving a car. These "sleep attacks" can last from 30 seconds to more than 30 minutes. They may also experience periods of cataplexy, or loss of muscle tone, which ranges from a slight buckling at the knees to a complete, "rag doll" limpness throughout the body.

In the general population, narcolepsy happens to one in every 2,000 people. It can occur at any time throughout life, but it will most likely begin during the teen years. Although narcolepsy has been found to be hereditary, some environmental factors contribute. Narcolepsy is a disabling and underdiagnosed illness: for sufferers, the effects can be devastating.

Studies have shown that even treated patients are often significantly psychosocially impaired in the areas of work, leisure and interpersonal relations, and they are more prone to accidents. These effects are even more severe than the well-documented deleterious effects of epilepsy when similar criteria are used for comparison.

Symptoms include excessive sleepiness, a temporary decrease or loss of muscle control (sometimes associated with getting excited), vivid dreamlike images when drifting off to sleep and waking up unable to move or talk for a period of time.

### Narcolepsy and Driving

Several states have imposed driving restrictions on people with narcolepsy. These restrictions usually entail a narcolepsy-free period of one year after starting treatment and no drug-related symptoms. Although these restrictions do not extend to scuba diving, some dive physicians believe such guidelines may be advisable.

Side effects from the drugs used to combat the sleepiness of narcolepsy constitute another concern. Medications used to treat narcolepsy include stimulants, anticataleptic compounds and hypnotic compounds, some of which have definite effects and side effects that are definitely adverse for scuba divers.

Stimulants that increase the metabolic rate, as some narcolepsy-fighting medications do, can cause an increased risk of oxygen toxicity in

divers using enriched air (nitrox). Any drug that affects the sense organs can also alter the decision-making process or increase risk-taking, and they are definitely adverse to divers.

### Advice About Diving

The merits of each case, the drugs required, the response to medication and the length of time free of narcolepsy should determine each diver's fitness. How each diver copes with excitement, emotions and stressful situations are key considerations.

Any prospective diver should fully disclose this condition and any medications to the dive instructor and certifying agency. In addition, any prospective diver with narcolepsy should be mindful of the safety of buddies, dive instructors, divemasters and other individuals who can be affected by diving incidents. Divers with this condition who choose to dive might consider using a full face mask to decrease the risk of drowning in case of unconsciousness during a dive. □

### ABOUT THE AUTHOR

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John Yarbrough Photo



# Coping With Stress

## *Gaining Dive Experience Is the Best Teacher*

*By Joel Dovenbarger.*

**The Diver:** He is a 42-year-old male in good health, who has been diving for 15 years. A frequent diver in the ocean near his home, he has taken annual trips to more exotic and remote dive locations. He has logged more than 500 dives, many to depths greater than 30 m, has never had decompression illness (DCI), no history of back problems or neurological disease.

**The Dives:** He planned a dive trip with several days of diving on a Pacific liveboard dive boat. During the first two days of unrestricted diving, the diver experienced no problems or discomforts. On the third day, the diver made four multilevel dives, none deeper than 30 m.

**The Complications:** After the third dive, within 15 minutes of leaving the water, the diver said he noticed a very mild but odd sensation in his right arm and leg. It was neither numbness nor tingling, he noted, just “a strange sensation.” It did not worsen during his surface interval.

He proceeded to make his fourth dive of the day, another multilevel 30 m dive. The mild skin sensation on his right side continued, with no increase or decrease in intensity when he was topside.



Gregory Galland Photo

The fourth day of diving scheduled shallower dives. Because his symptoms had not changed during the evening, he decided to make a 50-minute, 13 m dive.

When he left the water and removed his dive gear, the diver noticed that the symptoms on his right side had become more pronounced. After being topside for about 30 minutes, he mentioned these aggravated symptoms to the vessel’s captain. The captain placed him on 100 percent oxygen. After an hour and a half, his symptoms had decreased in intensity - *a good indication that he was experiencing a pressure-related injury such as decompression illness.* At this point, the dive boat crew placed a call to Divers Alert Network to report the injury.

**The Treatment:** The diver noted that the right side of his body felt “very heavy,” and although he had no numbness in his arm and leg, described the touch sensation of the skin there as “not normal.” DAN advised the diver that he needed to be transferred to the area hyperbaric chamber for further evaluation and treatment, if necessary. The boat left for the nearest port, which was an hour away.

When the boat arrived, medical personnel transferred the diver to an ambulance. He waited there until an air ambulance could take him to the hyperbaric chamber, a two-hour flight away.

For the entire transfer to the hyperbaric chamber, the diver received 100 percent oxygen. When