

# *Anxiety*

## *Is It A Contraindication to Diving?*

*By John R. Yarbrough, Ph.D.*

### **WHAT IS ANXIETY?**

Anxiety refers to an overwhelming sense of apprehension or fearfulness. Marked by physiological signs, sometimes referred to as autonomic signs (see Table 1, p. -----\*\*), anxiety can produce both psychological and physical symptoms.

Anxiety can cause doubt as to the nature and reality of the threat as well as self-doubt concerning one's capacity to deal with the situation. Physical symptoms of anxiety can vary widely, from the damp palms and quickened heartbeat of mild apprehension, to the crippling, paralyzed feelings of a full-blown panic attack or phobic reaction. The difference between the two is really just a technicality.

Symptoms of anxiety vary from person to person, from situation to situation, and even from day to day within the same individual. For example, a person who is fresh and rested from a good night's sleep is likely to respond differently to a stressor than a person who has not slept because of illness or an individual who has stayed up all night partying and now has a hangover.

Anxiety can be precipitated by myriad stressors, and few places have provided such a wealth of stressors as the sea. At one time or another the oceans have embodied all of the more extreme fears of mankind, from fears of falling headlong into an unknown abyss, to the terrors of being devoured by sea monsters, to the fear of an overhead environment.

A brief look at some of the fears, or phobias, associated with the sea illustrates this further.

### **PHOBIAS ASSOCIATED WITH THE SEA**

- **Hydrophobia** - a fear of water
- **Ichthyophobia** - a fear of fish (or, more specifically, the fear of sharks, elasmophobia)
- **Nyctophobia** - a fear of darkness
- **Claustrophobia** - a fear of being enclosed or enveloped
- **Barophobia** - a fear of being crushed
- **Pnigophobia** - a fear of being unable to breathe, or of choking
- **Phagophobia** - a fear of being eaten alive
- **Bathophobia** - a fear of depth or sinking
- **Thanatophobia** - a fear of dying

*In sum: Thalassophobia - an irrational terror of the sea.*

## ***Ranges of Anxiety***

Anxiety does serve a purpose - an alarm to threat has definite survival value. Most typically, escape is the behavioral response to fear.<sup>1</sup> Occasionally, though, direct action is necessary (fight rather than flight) and physiological activation (see Table 1) sometimes provokes superhuman efforts, such as attacking a large predator or lifting a car to rescue a child trapped underneath.

Studies have also found that mild degrees of anxiety actually optimize performance in certain instances. In the case of 'test anxiety,' persons experiencing mild to moderate degrees of arousal usually performed better than individuals with no anxiety or those with an overwhelming degree of anxiety. A mild degree of anxiety is sometimes thought to cause an increased motivation to focus on the task, e.g., to study and to do well.

Overwhelming anxiety, though, tends to cause an individual to focus inwardly and thus away from the task at hand. A low level of anxiety in diving may help make a diver more cautious. An overly anxious state, however, can lead to the cognitive and perceptual narrowing discussed in diver training manuals.<sup>2</sup> The diver's focus and attention shift inwardly or onto one specific task, and he might overlook a critical element, such as running low on air at depth. This, in turn, could lead to panic.

On this far end of the anxiety continuum, panic refers to a sudden,

overwhelming anxiety of such intensity that it produces feelings of stark terror. Panic may be on cue - e.g., when a stimulus is presented - or it may be spontaneous, occurring in the absence of any provoking stimulus (other than, perhaps, a simple thought or idea). Compared with the fight-or-flight symptoms of anxiety, signs and symptoms of panic are more pronounced.

Panic states tend to be much more debilitating: rational thought is often suspended and people (or animals) may freeze, i.e., remain in a fixed position, or react in an unpredictable or self-endangering manner, such as bolting to the surface while breath-holding when scuba diving.

## ***Anxiety and Diving***

Rescue and professional divers are trained to recognizing stress in themselves and in other divers (see Table 2). They learn to intervene before that stress becomes excessive and results in exhaustion, panic or a diving accident or fatality.<sup>3</sup>

As stress increases, a diver's ability to recognize and respond properly diminishes.<sup>4</sup> In a demanding situation, it is critical for the diver to recognize and to break out of the escalating cycle of stress before it reaches panic proportions.

## ***Medical Conditions***

Note also that some medical conditions can produce feelings of anxiety: anemia, mitral valve prolapse (a cardiac condition), premenstrual symptoms, menopausal symptoms, diabetes, hypoglycemia (an

abnormally small amount of blood glucose), thyroid and parathyroid disorders, asthma and some systemic infections.<sup>5</sup> Along with other stressors, this can be a potent and dangerous combination.

## ***Medications***

Several medications can aggravate feelings of anxiety. Some of these drugs are caffeine, nicotine, yohimbine (an over-the-counter product sometimes used as a stimulant), pseudoephedrine (a decongestant), diet pills, theophylline (a bronchodilator used in the treatment of asthma or chronic bronchi), some antihypertensives (medications for high blood pressure) and various other preparations.

## ***Psychological Factors***

Similarly, concurrent psychological stresses, such as job-related problems, financial worries, stresses in relationships, and previous negative experiences, as well as negative thoughts (such as doubting one's own abilities or perceived limited control of a situation) can augment stress reactions. Studies have found that chronic worriers are more prone to anxiety reactions and have greater problems relaxing than those individuals who are less prone to rumination and worry.

## ***Learning Anxiety?***

At the most basic level, anxiety can be learned through a process of simple association. For example, children are usually not afraid of

small fuzzy creatures. But, for example, when mother walks into the kitchen and finds her 2-year-old child playing with a large gray rat, then jumps onto the counter, screaming hysterically for the child to move away from the animal, the child immediately associates the mother's panic with the rat. (Likewise, the rat most likely associates fear with children and hysterical mothers.)

In some instances we learn specific anxieties based upon other negative experiences. For example, if, when we were learning to swim, our teacher was patient and made the experience a positive one, we are more likely to view getting into the water as a positive action. On the other hand, if we had difficulty learning to swim, if our instructor was harsh or impatient, or we had another significantly negative experience, such as choking or near-drowning, we are more likely to view going into the water with greater anxiety.

A simple thought or association can often start a chain reaction of thoughts:

*I have on too much weight - What if I sink too fast? - I could burst an eardrum - No one would be able to reach me in time - I could go to the bottom, and it drops to over 800 feet off the coral wall - I could be crushed - I'm going to drown - PANIC!*<sup>6</sup>

Interestingly, we can "talk ourselves into" feeling more anxious over a given situation. Expectation,

negative imagery, worrying all can trick us into experiencing a situation more negatively than we should, usually before the situation is even encountered.

Author Bret Gilliam<sup>7</sup> described a 1965 study conducted by Tom Mount, a pioneer in U.S. cave diving, and Dr. Gilbert Milner. They studied



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the effects of "anticipated behavior modeling" with respect to perceived and observed (subjective vs. objective) effects and the probability of experiencing nitrogen narcosis.

In this experiment, three groups of divers received information regarding the topic of nitrogen narcosis:

- Group 1 was told that there was a high probability of experiencing the effects of nitrogen narcosis - in fact, they were told that everyone experienced severe symptoms at 40 metres.

- Individuals in Group 2 were informed that there was such a state as nitrogen narcosis, but that this was relatively rare and only a few people experienced symptoms at depth.

- The final group received a lecture regarding the recognition of symptoms, risks and dangers, but were told that persons with a strong will were able to resist and / or overcome symptoms of narcosis.

In test dives between 40 and 73 metres, the group who expected to experience symptoms of narcosis actually experienced these symptoms with greater frequency and severity than did persons in the other groups.

Dr. Maxie Maultsby, a proponent of rational behavioral therapy, discussed what he termed "negative self-talk," our habit of continuing in a pattern of maladaptive responses - in this case, our continuing to tell ourselves that we can't handle a situation. However, Maultsby maintains that, if we can talk ourselves into a pattern, we can also talk ourselves back out.<sup>8</sup>

## Overcoming Anxiety

### Psychological Techniques

“I’ve seen all those pictures and videos, and everyone looks like they’re having such a good time . . . I only wish that I could do that.”

Several articles in past issues of *Alert Diver*<sup>9</sup> have discussed the use of medications in diving, and many persons have been prescribed medications, such as imipramine (Tofranil<sup>®</sup>), propranolol (Inderal<sup>®</sup>) or alprazolam (Xanax<sup>®</sup>), to assist with stress and anxiety. These same articles have admitted some hesitation over divers’ use of certain medications, especially if these had a tendency to cause drowsiness or could otherwise impair a diver’s awareness of surroundings.

On the other hand, a variety of non-pharmacological techniques have also been used in the treatment of anxiety. There are relatively few contraindications to the use of psychological techniques, and in some persons, such as those having adverse reactions to medications, these may even be preferable. A few of these include systematic desensitization, implosion therapies, cognitive-behavioral techniques and hypnosis. Understanding the mechanisms of anxiety, as discussed above, helps in understanding how these techniques might work.

### Systematic Desensitization

This has its roots in behavioral

learning theory - that is, in its most basic form, that a stimulus invokes a response. In the case at hand, a stimulus (entering the water) evokes a response (avoidance and anxiety). Behavioral theorists have asserted that, if the fear could be conditioned or learned, it could, with a little effort, become unlearned. By pairing an anxiety-provoking stimulus with a neutral or incompatible feeling, such as that of relaxation, the person

**TABLE 1**

*Autonomic Fight or Flight Symptoms of Stress:*

- Pupils dilate
- Cardiac muscle is stimulated; heart rate increases
- Peripheral blood vessels constrict; arterial blood pressure increases
- Blood flow is diverted to the skeletal muscles
- Salivation and digestion stops
- Respiration increases, becoming deeper and more rapid
- Moisture rises to the surface of the skin in the form of perspiration; the body is then cooled through evaporation, thus conserving energy
- Blood sugar levels increase
- Blood tends to clot more readily

eventually should be able to overcome the original source of the anxiety. In practice, this works in much the same way as Pavlov’s dog “learning” to salivate when the dinner bell rang.

For example, a student is motivated to dive but experiences anxiety over actually donning the equipment and submerging. The thought of actually diving in open water causes

shortness of breath, racing heart and profuse sweating. To overcome this, the person learns relaxation techniques, such as controlled breathing and alternately tensing and relaxing muscle groups to bring into a physical awareness the differences between being tense and being relaxed.

The student develops a hierarchy of anxiety-producing thoughts and behaviors, from the least anxiety-producing (standing poolside) to the more anxiety-producing (standing in the pool in full equipment) to the most anxious (submerging to the bottom of the pool).

First, the person may go through a series of mental exercises, such as imagining himself approaching the water, carefully and in great detail putting on the scuba equipment, and then stepping into the pool. Some individuals, on the other hand, may choose to go through a series of in vivo exercises (actually walking into the pool, breathing through a regulator while standing in waist-deep water, kneeling with the head just underwater). Or they may use a combination of the two. Depending on the individual student’s motivation to continue diving and the patience of the instructors, divemasters and diving partner, the student should be able to significantly reduce his or her anxiety to the point of enjoying a positive dive experience. Following this, each successful dive tends to reinforce the positive aspects of recreational diving.

## ***Implosion Techniques***

Sometimes referred to as “flooding,” implosion techniques overwhelm the person with the anxiety-producing stimulus or imagery in a controlled setting, with the idea that the person can more quickly become accustomed to the stressor. While the real-life practice of strapping weights and equipment to panicking student divers and dropping them to the bottom of a lake is obviously not recommended, guided imagery, in which students imagine in detail a worst-case diving scenario, might be of limited use in some cases.

## ***Cognitive-Behavioral Techniques***

These treatment methods emphasize the rearranging of a person’s anxiety-producing thinking, perceptions, attitudes and behavior. Under the direction of a therapist, individuals explore the antecedents to their anxiety, (e.g., thoughts about equipment failure, losing their dive partner and other stressors), and they learn other ways of thinking to decrease or eliminate these concerns. They may also learn specific techniques to stop these worrisome thoughts before they reach the point of overwhelming anxiety.

Recognizing that anxiety can, at times, be self-perpetuating through such mechanisms as fearing catastrophes and over-generalization, cognitive-behavioral therapists often challenge these false beliefs.

For example, a person has a scary experience while entering rough seas

from a boat. As a result, the diver convinces himself that something unpleasant (e.g., mask flooding) will happen every time he has to make an entry into rough seas. The diver becomes anxious and does not enjoy subsequent dives. A cognitive-behavioral approach to this situation might be to explore: “What is the worst thing that could happen if your mask floods?” or “What would happen if you chose to sit out that dive?”

One interesting and extremely simple technique, called “thought stopping,” is no more complicated than wearing a rubber band on one wrist; when an intrusive and worrisome thought begins, the student can snap the rubber band against his wrist. This stinging and slightly painful sensation immediately calls to attention that they are engaging in anxiety-producing thought. He then consciously tells himself to “Stop!” With time and a little practice, these techniques have achieved much success in reducing anxiety.

## ***Hypnotherapeutic Techniques***

Techniques in hypnotherapy combine a number of other methodologies, including relaxation and guided imagery, while the student is in a state of increased relaxation and heightened suggestibility. There is nothing magical about hypnosis, nor should it be considered a “miracle cure” for anxiety - it is merely another tool to assist in the overall treatment of anxiety.



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Some factors in determining one’s response to hypnotherapeutic techniques include one’s trust in the therapist, prior expectations for outcomes, beliefs and motivations concerning hypnosis, and individual differences (i.e., some persons are more susceptible to hypnotic induction than others or can relax more easily). Some persons can even be taught self-hypnosis techniques to take into the field. With a little practice, these have been of great value in combating the effects of anxiety

## ***Additional Dive Training***

Perhaps even more simply, practice and additional training can help lessen anxiety. Instructors sometimes overlook the importance of patience and over-learning in making students comfortable in the open water. Some students will need additional time and practice or require one-on-one instruction in particular areas. It should be emphasized that it is always acceptable to sit out a dive for any reason.

## In Sum

Professional divers are taught to recognize signs and symptoms of stress, both in themselves and in students or novice divers. In many cases, identifying and removing a particular stressor can help alleviate anxieties on a dive. However, there will be instances in which recreational divers remain apprehensive and the reason(s) may not be readily apparent. Depending on divers' motivations to continue diving and their willingness to work toward a resolution of their anxieties, a number of psychological techniques can assist in overcoming these problems. Mild levels of anxiety do not have to be a contraindication to recreational diving. □

## ABOUT THE AUTHOR

DAN Member John R. Yarbrough, Ph.D., is a psychologist with the University of Texas Medical Branch at Galveston. He also maintains a private behavioral medicine practice and lectures throughout the region.

## REFERENCES

Available on request.

## SIGNS AND SYMPTOMS OF PANIC

- Dyspnea (shortness of breath)
- Palpitations
- Chest pain
- A feeling of choking
- Dizziness or vertigo
- Feelings of unreality
- Paresthesias (numbness / tingling)
- Hot or cold flashes
- Diaphoresis (profuse sweating)
- Syncope (fainting or loss of consciousness)
- Tremulousness (quivering)
- A belief that one is losing control

## STRESSORS SPECIFIC TO DIVERS INCLUDE:

- **Time pressures** - According to recreational dive planners, limited amounts of time can be spent at various depths. Planning and staying within no-decompression limits provides a significant source of stress, especially when accompanied with task-loading.
- **Task-loading** - Basically, this translates as attempting to do too many things at once. An example would be a scuba diver attempting to hold a light and camera while navigating within an overhead environment. It is easy to focus on one task to the exclusion of others (perceptual narrowing) when that task is complicated or particularly demanding.
- **Pushing limits** - Diving beyond physical limitations or pushing oneself too hard, either physically or mentally.
- **Environmental conditions** - These include unfamiliar dive sites, currents, surface conditions, diving in cold water, reduced visibility or diving at night.
- **Lack of readiness** - Too little preparation or training for a particular dive can be a major stressor.
- **Equipment considerations** - Diving with new or unfamiliar equipment, or diving with equipment (such as a drysuit) for which one has not been properly trained.
- **Diving for the wrong reason** - This includes peer pressure, diving beyond safe limits "just for the thrill," diving when you are uncomfortable or ill (seasick or hung over), or going because a friend is diving, diving to save face or fear of being left out.

## TABLE 2: SIGNS OF STRESS IN DIVERS

- Rapid breathing or hyperventilation
- Muscle tension
- "White knuckled" grip
- "Wild-eyed" look or avoiding eye contact
- Irritability or distractibility
- "Escape to the surface" behavior
- Stalling, e.g., taking too long to don equipment or enter the water
- Imaginary equipment or ear problems
- Being overly talkative or becoming withdrawn
- Contact maintenance, e.g., clutching the swim ladder or anchor line

## FIRST AID & OXYGEN INSTRUCTOR PROGRAMS

- O<sub>2</sub> Instructor (L1&L2):**  
Christchurch NZ ... 10-11 March
- O<sub>2</sub> Instructor (L1):**  
Melbourne, Aust ... 6 April
- First Aid Instructor:**  
Melbourne, Aust ... 7-8 April
- O<sub>2</sub> Instructor (L1):**  
Brisbane, Aust ... 6 April
- First Aid Instructor:**  
Brisbane, Aust ... 7-8 April
- O<sub>2</sub> Instructor (L1):**  
KL, Malaysia ... 26 May
- O<sub>2</sub> Instructor (L2):**  
KL, Malaysia ... 27 May
- First Aid Instructor:**  
Melbourne ... 12-13 July
- First Aid & O<sub>2</sub> Instructor-Trainer:**  
Melbourne ... 14-16 July
- O<sub>2</sub> Instructor/Instructor-Trainer:**  
Puerta Galera, PI ... August