

Fathoms of Fear

A Case Study of Panic in a Recreational Scuba Diver

Instructors and divemasters are trained to recognize outward signs of diver anxiety and panic...

BY DR. DAVID F. COLVARD



David Haas Photo

The diver:

A 30-year-old female with open-water certification had been diving for less than a year and had made fewer than 10 dives. She was in good health, was taking no medication and had no history of anxiety or panic at the time of the dive in question.

The dive:

The situation occurred on an advanced open-water training dive scheduled for a depth of 27 metres on a wreck. The diver noted that she did not have a good feeling about the dive before the boat even left the dock. "The ocean was very rough ... a storm was approaching," she said. "I was hoping the dive would be cancelled. I didn't feel comfortable and didn't want to be there."

Her boyfriend-buddy was inexperienced as well but had kept an eye on her during previous dives. He pushed her to go ahead with this dive, however, so they could complete the advanced certification together.

The diver said she had begun to feel seasick before arriving at the dive site. As the boat anchored, she was in a rush to get off the boat and into the water. Unfortunately, she did not feel any better once in the water because the waves were so high, kicked up by the increasing winds.

The water was very cold, she noted, and visibility was only 3 to 4 metres. She pushed herself hard to keep up with the instructor who led the group around the perimeter of the wreck.

The complications:

Struggling with the currents, the diver's anxiety increased. She was struggling in the water, short of breath and felt that no one was noticing her difficulty. At one point she became panicked enough that she thought she was going to die.

Still, she had made it through most of the planned dive at the planned depth. She had had enough, however: She had to escape. The diver made a rapid ascent, alone, at about 30 m / minute and without making a planned safety stop. Once on board the boat she started to cry.

Aside from embarrassment, she suffered no physical signs or symptoms of injury despite her rapid ascent and missed safety stop.

The outcome:

The diver did not complete her advanced open-water certification. Plus, she reported developing anticipatory anxiety and avoidance to this type of dive. She no longer dives in colder waters, preferring clearer tropical seas. She believes she could have avoided the panic and rapid ascent by going with her first instinct and not going on the dive.

Although she continues to dive, sometimes she becomes short of breath when she feels rushed to get off a dive boat or to get to a particular point of a dive quickly. "If I start to think too much

about it, I freak myself out, and it gets worse," she said. "At least now I know it is mostly mental, and if I slow down and relax, then everything is OK."

The discussion:

Anxiety and panic are common occurrences in recreational scuba diving, especially with inexperienced divers. Typical features of panic include palpitations, pounding heart, accelerated pulse rate, sensations of shortness of breath or a smothering feeling. Anxiety-panic also causes choking sensations, chest pain or tightness, nausea, dizziness, unsteadiness, lightheadedness or faintness, numbness or tingling sensations, and fear of losing control or of dying.

Fear of suffocating and dying is common in panic. Instructors and divemasters are trained to recognize outward signs of diver anxiety and panic, but they may be distracted by other activities in the group.

Panic surveys

Morgan (1995) reported in a 1987 survey of 254 recreational scuba divers that 64 percent of the females and 50 percent of the males had "panic or near-panic" episodes on one or more dives. In 2000 I reported from a survey of more than 12,000 recreational scuba divers that 37 percent of the females and 24 percent of the males had one or more panic episodes of "an intense fear of losing control or dying" while diving.

In a follow-up survey of more than 4,300 recreational scuba divers, we found that 14 percent of females and 8 percent of males had panic episodes while diving during the subsequent one-year period, and another 14 percent of females and 12 percent of males had near-panic episodes while diving during the same one-year period. Overall, in a one-year period, 28 percent of the female divers and 20 percent of the male divers had panic or near-panic episodes on one or more dives. (Colvard and Colvard 2003)

According to dive researchers Dr. Arthur J. Bachrach and Dr. Glen H.

The most common relative-risk factor for panic in both male and female divers was hyperventilation associated with anxiety.

Egstrom (1987), predisposing conditions for panic include the physical and emotional state of the diver, presence of one or more stressors, impaired functioning, unforeseen event(s), loss of control and then panic. From there, panic and the typically accompanying fear of suffocating or dying can produce an intense urge in divers to flee to the surface in a rapid ascent, risking injury.

However, in our 2003 survey of more than 12,000 recreational scuba divers, we found that among the 3,300 who had at least one panic episode during a dive only 15 percent of both males and females made a rapid or uncontrolled ascent with their first panic episode. (See Table 1.)

Within that 15 percent of divers reporting a rapid ascent, only 5 percent of males and 4 percent of females reported signs or symptoms of decompression illness, and only 1 percent of males and 2 percent of females underwent recompression. Only one reported a permanent injury: residual numbness in the left toes after five years.

How panic affects us

In a recent conversation I had with Egstrom, he pointed out that panic by itself does not cause dive accidents and fatalities. Panic and all its related complications, he noted, can make a bad situation much more difficult to manage. On a rare occasion, a fatality

results. In all fairness, there were no deaths reported in our surveys.

In the opening scenario, the diver felt anxious even before boarding the dive boat because of the threatening weather and rough seas. Her boyfriend-buddy applied peer pressure, and although it was against her better judgment, she complied to please him. The boat ride resulted in seasickness, which the diver attempted to relieve by entering the water as quickly as possible. Instead she became further stressed by cold water, high swells and limited visibility.

The diver reported having to kick hard to keep up with the instructor and group. Strenuous activity alone does not typically elicit panic. Stein and colleagues (1992) reported in a study of 31 subjects that submaximal exercise testing on a bicycle ergometer did not appear to cause panic attacks in either patients with a known panic disorder or in normal control subjects.

Hyperventilation, however, proves a different matter. Nardi and colleagues (1999) reported in a study of 24 subjects that three minutes of hyperventilation did appear to cause panic attacks in 69.2 percent of panic disorder patients but in only 9.1 percent of normal volunteers.

Table 1.
Diver response to first panic attack during diving (%)

	Males (n = 2206)	Females (n = 1099)
Remembered training	82	77
Used training	81	73
Recognized offer of help	38	67
Made rapid or uncontrolled ascent	15	15
Obtained more training	82	80
*p<0.0001		

Why did the diver panic?

While our diver apparently had no history of panic disorder, she did report feeling short of breath from trying to keep up with the instructor. It is likely that she was hyperventilating, possibly even overbreathing her regulator.

Such behavior in a diver can lead to a feeling of suffocation and fear of dying. This in turn can lead to panic and a rapid ascent. In our study of 12,000-plus divers, we inquired about more than 40 commonly listed dive stressors. (See Tables 2, 3 and 4.)

The most common relative-risk factor for panic in both male and female divers was hyperventilation associated with anxiety, which the diver also reported. (See Table 5.)

What could this diver have done to prevent the rapid ascent? As she said herself, she wanted to cancel the dive. She could have remained topside, even if it meant disappointing her partner. Prior to the dive the instructor could have inquired as to her condition and asked about any apprehension she might have had about the planned dive.

Table 2.
Dive conditions leading to panic

- Poor visibility
- Separation from buddy or instructor
- Low on air or out of air
- Sharing air
- Rough seas or surf
- Strong current or surge
- Nighttime or darkness
- Overhead environment (cave, wreck, ice)
- Shark
- Other dangerous marine life
- Deep dive
- Cold dive
- Solo dive
- Drysuit dive
- Entrapment or entanglement
- Loss of orientation
- Long surface swim
- Other stressful dive conditions not listed above

Credit: Colvard, 2000 survey

Just say no

Any excuse would have allowed the diver to avoid the dive. For example, when I was on a shark cage dive off San Diego several years ago, a diver suddenly developed stomach problems right before her turn in the cage. She received only sympathy at missing out on the adventure, no criticism.

Our diver was feeling anxious and sick before she even entered the water. Bobbing on the surface in cold water, another well-known stressor, added to her problems rather than relieving them.

The poor visibility on the bottom required that the diver keep close to the instructor and the rest of the group, but the sustained physical effort and presumed heavy and rapid breathing proved to be more than she could handle. Any one stress factor might have been manageable for her, but a cascade of factors was too much. Ideally, her dive buddy or the instructor should have noticed her struggle to keep up with the group and stayed with her.

Instead, the diver became fatigued and even more anxious, which eventually led to panic. At this point, she feared for her life and made an unwise rapid ascent. The event was made even more problematic because no one in her dive group even noticed her discomfort - or her departure.

Table 3.
Equipment problems leading to panic

- Mask leak
- Loss of mask
- Loss of weight belt
- Tank slippage
- Regulator leak or free-flow
- Broken or loose fin strap
- Uncontrolled ascent
- Loss of computer or gauge
- Dive light failure
- Poorly fitting equipment
- Difficulty operating buoyancy compensation device
- Overweighted or underweighted
- Other stressful equipment problems not listed above

Credit: Colvard, 2000 survey

Table 4.
Physical and psychological issues leading to panic

- Difficulty equalizing ears
- Fatigue or overexertion
- Muscle cramps
- Chest tightness
- Hyperventilation
- Decongestant medication
- Other medications
- Inhaled water instead of air
- Motion sickness
- Fear of the unknown
- Fear of scrutiny or embarrassment
- Task overload
- Other stress physical or psychological factors not listed above

Credit: Colvard, 2000 survey

Table 6.
Trait anxiety predicts panic behavior in beginning scuba diving students

- 42 students in four-month course
- Pre-instruction State-Trait Anxiety Inventory*
- 35 of 42 (83 percent) accurate predictions using a trait score + 1 standard deviation above mean
- Predicted 64 percent of actual panics
- Therefore, panic behavior can be predicted in beginning students

* STAI is the definitive instrument for measuring anxiety in adults and is the most widely used self-report measure of anxiety.

Credit: Morgan WP, Raglin JS, O'Connor PJ, Trait anxiety predicts panic behavior in beginning scuba students. Int J Sports Med 2004; 25.

Table 5.
Relative risk of first panic during dive in presence of the following:

	Males	Females
Hyperventilation	4.6	3.1
Other physical or psychological factor	3.4	2.4
Other equipment problem	3.4	2.0
Other dive condition	3.4	2.6
Chest tightness	2.6	2.0
Fear of the unknown	2.5	2.1
Cold water	2.1	1.1
Poor visibility	1.9	1.1
Inhaled water instead of air	1.8	1.5
Task overload	1.8	1.4
Loss of orientation	1.6	1.3
Fear or scrutiny or embarrassment	1.6	1.2

Table 7.
Trait anxiety and panic behavior in experienced scuba divers in 2003

- Year 2003 male experienced divers (n= 1,415)
- STPI Trait Anxiety (10 items) using average trait score + 1 standard deviation to predict panic
- Reported panic rate in 2003 was 7 percent (96 of 1,415)
- Trait Anxiety predicted only 20 (21 percent) of 96 actual panics
- Failed to predict 76 (79 percent) of 96 actual panics

Credit: Colvard, 2004 survey data on file; Colvard, data on file from 2004 survey/poll

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What can we do?

When they become aware of stress or anxiety, divers are taught to "Stop-Breathe-Think-Act" before it gets out of control. The type of breathing that is most effective at calming an anxious or panicked diver is called "diaphragmatic breathing" or "belly breathing." This is a skill that has to be learned and practiced long before it is needed. A 30-minute MP3 file, the "Calming Breath" training program by Dr. T.J. Griffiths, can be downloaded for free at www.DivePsych.com.

Griffiths and others (1985) have identified trait anxiety as a predictor of panic in beginning dive students. (See Table 6.)

But our surveys of experienced divers failed to demonstrate that trait anxiety, certification level, years of experience or number of dives reliably predicted panic. The bottom line is that most divers are at risk of panic under both predictable and unpredictable circumstances. (See Table 7.)

Remember, repetition is good. Overlearning basic dive skills and breath control under adverse conditions remain keys to deeply instilling the skills necessary to cope with whatever may come during a dive. Still, sometimes the best thing a diver can do is to be aware of his or her own state of mind and the circumstances and be willing to cancel any dive if necessary.

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About the Author

David F. Colvard, M.D., is a board-certified psychiatrist, clinical investigator and divemaster in Raleigh, N.C. Since 2000, he has conducted online surveys of thousands of divers around the world and has reported results at scientific meetings, workshops and continuing education programs in the United States and South Africa. He hosts the website www.divepsych.com, which provides evidence-based information for divers on psychological and stress factors in scuba divers.

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