

# ***Anxiety & Panic in Divers***

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***Want more tank air and  
bottom time for your  
money?***

Breathe like a baby...

***Want more air for just  
one more shot?***

Breathe like a baby...

I dive to see  
...*"the works of the LORD,  
His wonderful deeds in the deep."*  
*Psalm 107: 24 (NIV)*



***Too many unexpected  
things going wrong at  
the same time?***

# BACKGROUND:

I was in training for certification. I was already a reasonably experienced diver; I'd been "Club Med" certified for around three years and had gone on a lot of dives in nice deep ocean water.

# Trigger:

I became *trapped in a confined space* that had quickly gone from six feet of vertical clearance down to barely 3 feet.

# STOP

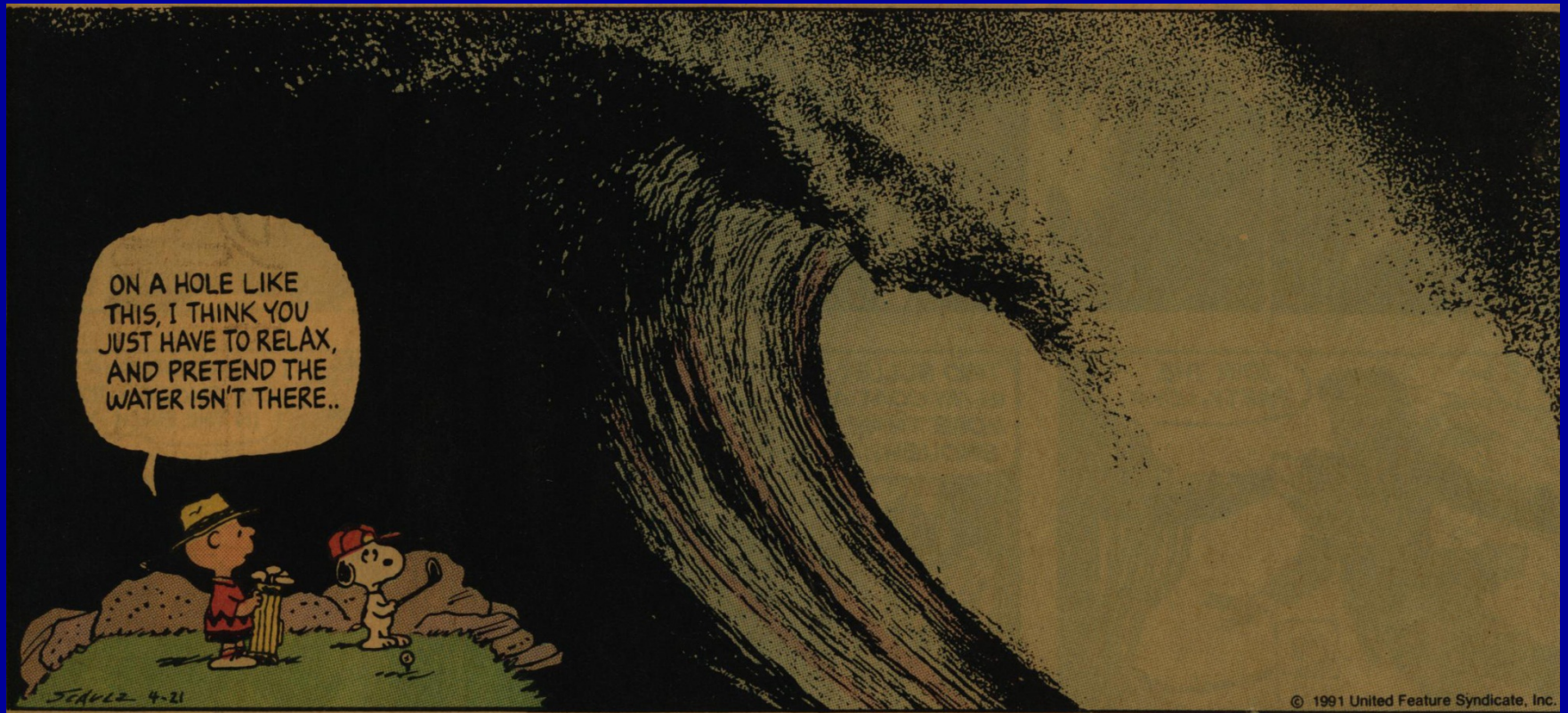
For maybe five or ten very long seconds, I just kind of lay there,



# BREATHE

slowing myself down,

# BREATHE



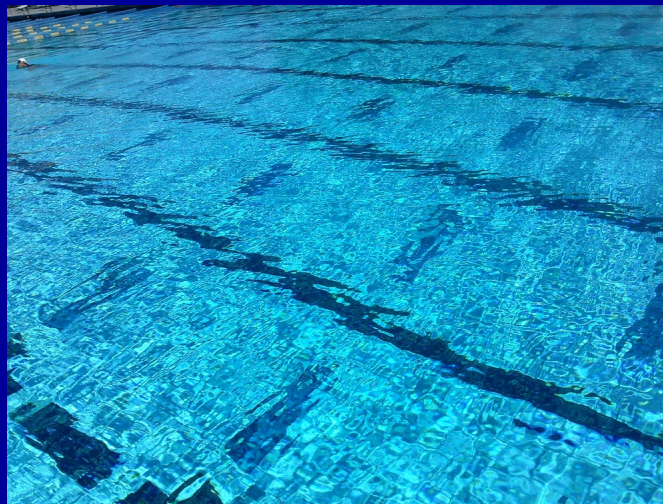
# THINK

... and thinking.

Then the solution came to me:

# THINK

I was in the *small* end of a swimming pool...



# ACT

*so, I stood up!*

# DISCUSSION

Somehow in the pool, knowing I was supposed to remain submerged and having decided I would do so, having the bottom suddenly come up like that, forcing me toward a surface I'd already decided not to breach, aimed me straight toward panic.

# DISCUSSION

Beyond my pre-decision to stay under, the incipient panic was fed by the fact that it felt like a powerful weight was holding me down when I did try to rise even a foot or two above the approaching bottom.

This turned out to be the weight of the tanks as they broke into the free air. (I was still under, so it wasn't clear what was seemingly holding me down.)

# DISCUSSION

120 feet on the bottom of the Pacific, surrounded by Barracuda,



**No problem.**



# DISCUSSION

Monterrey Bay with 3 inches of visibility,



**No problem.**

# DISCUSSION



San Jose State swimming pool,

***BIG*** problem

Bruce T.

# Letter from Scuba Diving Couple

*The morning of the 26th we were on a dive (Similan Islands) and at about 30 feet deep when a strong current appeared. Sherry was about ten feet from me and I was suddenly spun around and was beginning to be sucked down. Sherry was being pulled up and we were able to get together just as the current became very strong and the sand created a white out. I would guess we were traveling about 20 mph at zero visibility. We kept an eye on our depth gage and were able to maintain our depth at about 30 feet.*

*We surfaced after about ten minutes and found ourselves in very angry water that was boiling and whirl pooling. We were fairly close to shore, but decided to kick away so the boat could see us and could pick us up. After about ten minutes the boat found us and picked us up. We were diving with nine other people and were all spread out over about a mile. Everyone surfaced and everyone was okay. The captain said the water rose about 30 feet instantly.*

*We were in the middle of the tsunami, and have been given a second life.*

*Kirk and Sherry from Colorado, describing 26 December 2004 Tsunami*

***Ever been nervous or  
panic on a dive?***

**STOP**

**BREATHE**

**THINK**

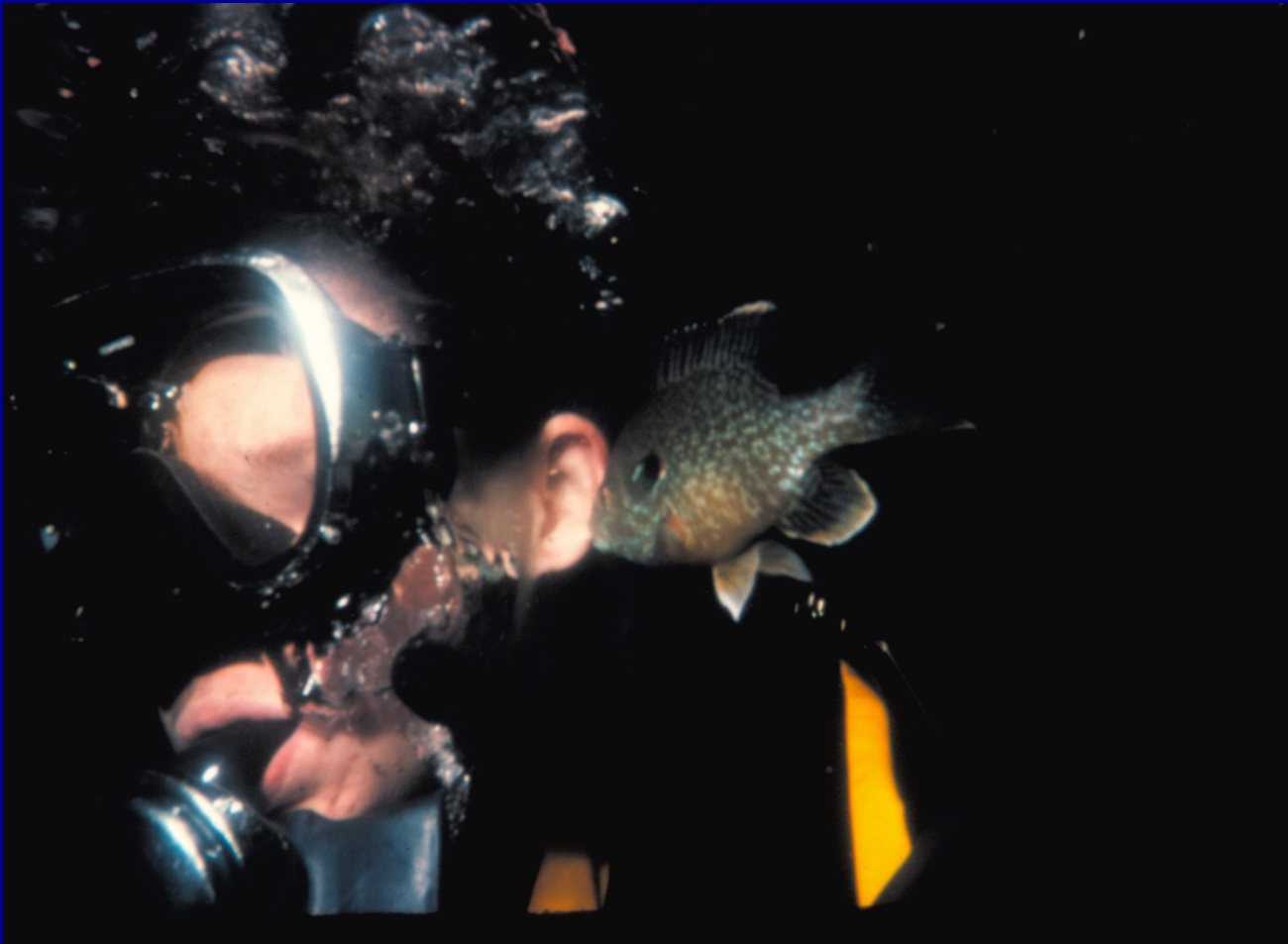
**ACT**

# ***Part 1 – Causes and Symptoms of Diver Stress***

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# Healthy Fear? Paralyzing Anxiety or Panic?



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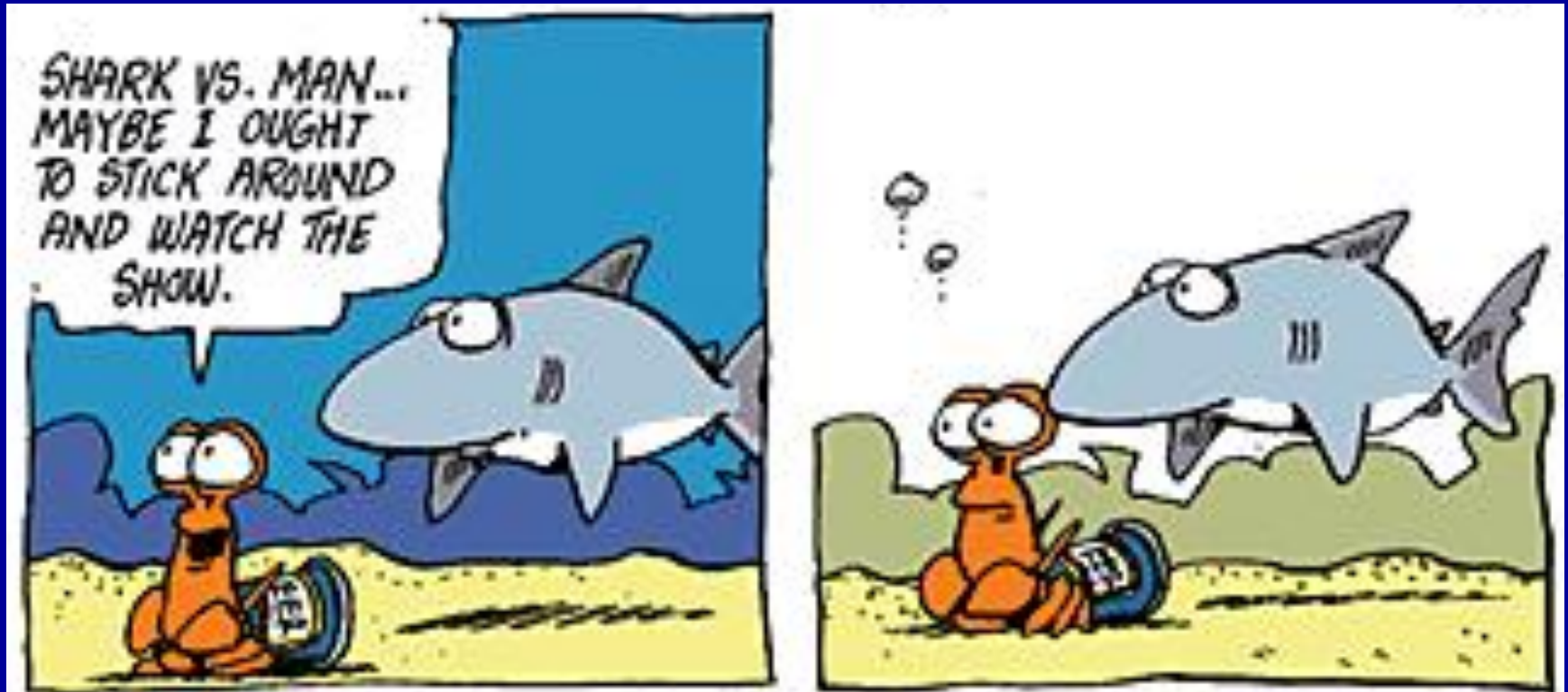
# Sherman's Lagoon by Jim Toomey

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# Cathy Church says,

- “Don’t underestimate the power of fear.”
- “Expect something unexpected.”

# Healthy Fear vs. Anxiety

## Healthy Fear

- Valid perception of danger
- Fight or Flight
- May keep you alive

## Anxiety

- Not related to any real threat
- No useful function
- Fortune-telling
- Catastrophizing
- **Affects breathing**
- Can lead to PANIC

# So what's wrong with panic?

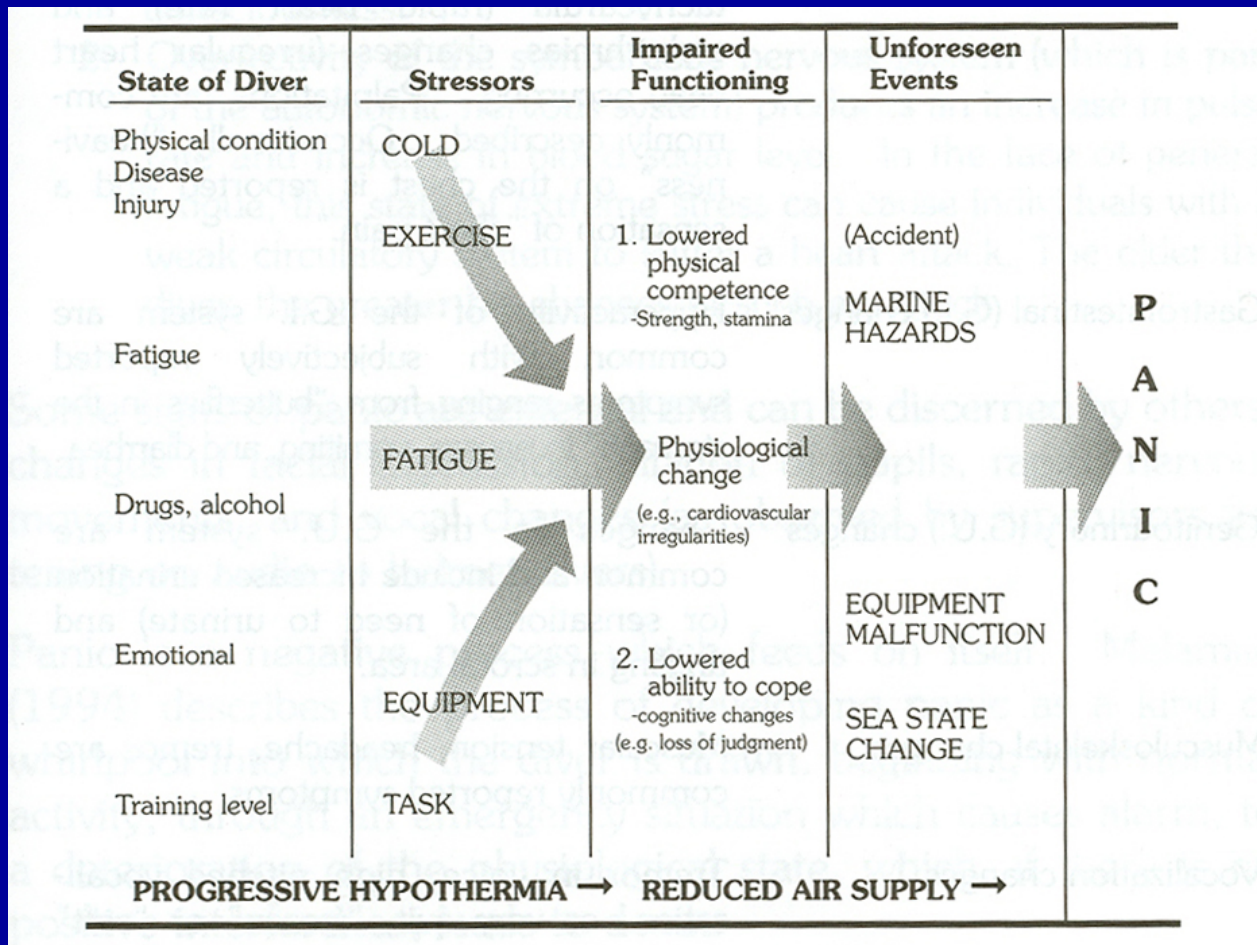
- Psychological stress reaction of extreme anxiety.
- Frenzied and irrational behavior.
- It is unhelpful
- Reduces the chance of survival

According to various old reports,  
39% - 60% of diver deaths were  
*associated with panic,*

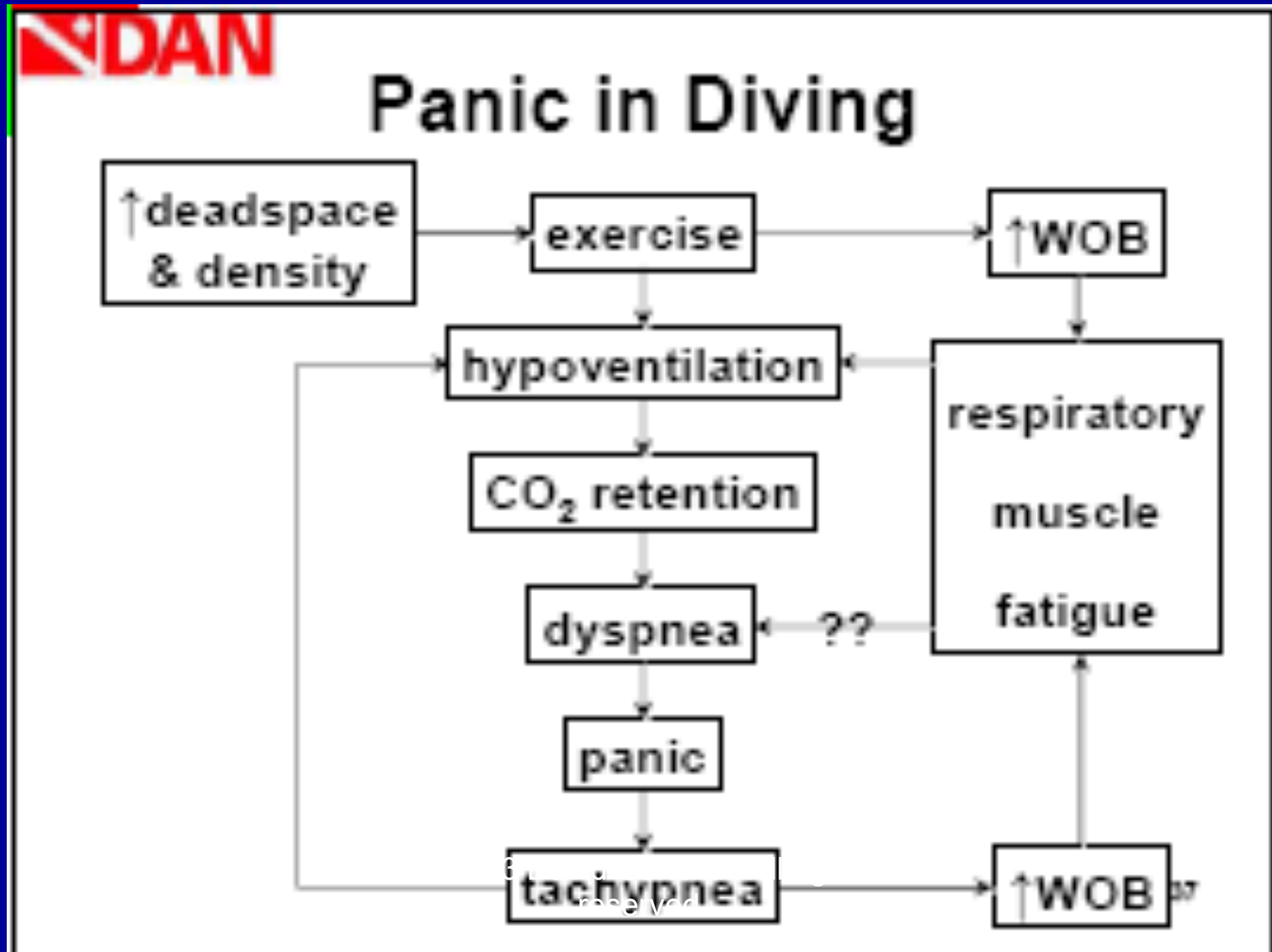
**But panic was usually  
*NOT* the trigger or primary factor.**



# Panic in the diving environment



# Panic in the diving environment



# WILLIAM P MORGAN, EdD

## 1986 Case-control Study (N=245)

Incidence of “panic or near-panic”

50% of Men

64% of Women ( $p = 0.046$ )

Panic event perceived as life-threatening

48% of Men

35% of Women ( $p = 0.0632$ )

# SAFETY SURVEY OF RECREATIONAL SCUBA DIVERS

by Drs. Colvard

- Anonymous, confidential survey (poll) hosted by Rodale's *Scuba Diving Magazine*
- 180 paper surveys collected from August 2000 to January 2, 2001
- 12,722 online surveys collected from September 2000 to January 2, 2001
- Total of 12,231 complete surveys

*Colvard, D.F. and Colvard, L.Y. A Study of Panic in Recreational Divers, The Undersea Journal, First Quarter 2003, pp 40-44.*

## Q 9. Have you ever had a panic experience during a dive?

24% for Males (N= 9292)

37% for Females (N= 2939)

**P < 0.0001 Two-sample t-test between  
percents t-statistic 14.525  
df = 12229**

*Colvard, D.F. and Colvard, L.Y: A Study of Panic in Recreational Divers, The Undersea Journal, First Quarter 2003, pp 40-44.*

# Diver Response to 1st Dive Panic Experience

	Males (N=2206)	Females (N=1099)
Remembered Training	82%	77%
Utilized Training	81%	73%
Another Diver Offered Help	38% *	67% *
Rapid/Uncontrolled Ascent	15%	15%
Obtained More Training	82%	80%

**\*p < 0.0001**

*Colvard, D.F. and Colvard, L.Y: A Study of Panic in Recreational Divers, The Undersea Journal, First Quarter 2003, pp 40-44.*

# Dive Conditions

(Colvard – 2000 survey)

- 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
- Dry suit dive
- Entrapment or entanglement
- Loss of orientation
- Long surface swim
- Other stressful dive conditions not listed above

# Equipment

(Colvard – 2000 survey)

- 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 functions
- Dive light failure
- Poorly fitting equipment
- Difficulty operating BC
- Over-weighted or under-weighted
- Other stressful equipment problems not listed above



# Physical & Psychological

(Colvard – 2000 survey)

- 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 stressful physical or psychological factors not listed above

# Relative Risk of First Panic During Dive in the Presence of the Following

(Colvard – 2000 survey data on file)

<b>Top 6 Relative Risks</b>	<b>Males</b>	<b>Females</b>
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

# Relative Risk of First Panic During Dive in the Presence of the Following

(Colvard – 2000 survey data on file)

Next 6 Relative Risks	Males	Females
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 of scrutiny or embarrassment	1.6	1.2

# Trait Anxiety and Panic Behavior in Experienced Scuba Divers in 2001

Year 2001 divers (n= 4,213) in Colvard poll

		Average STPI Trait Anxiety
Panic	10%	16
Almost Panic	13%	16
No Panic	77%	15

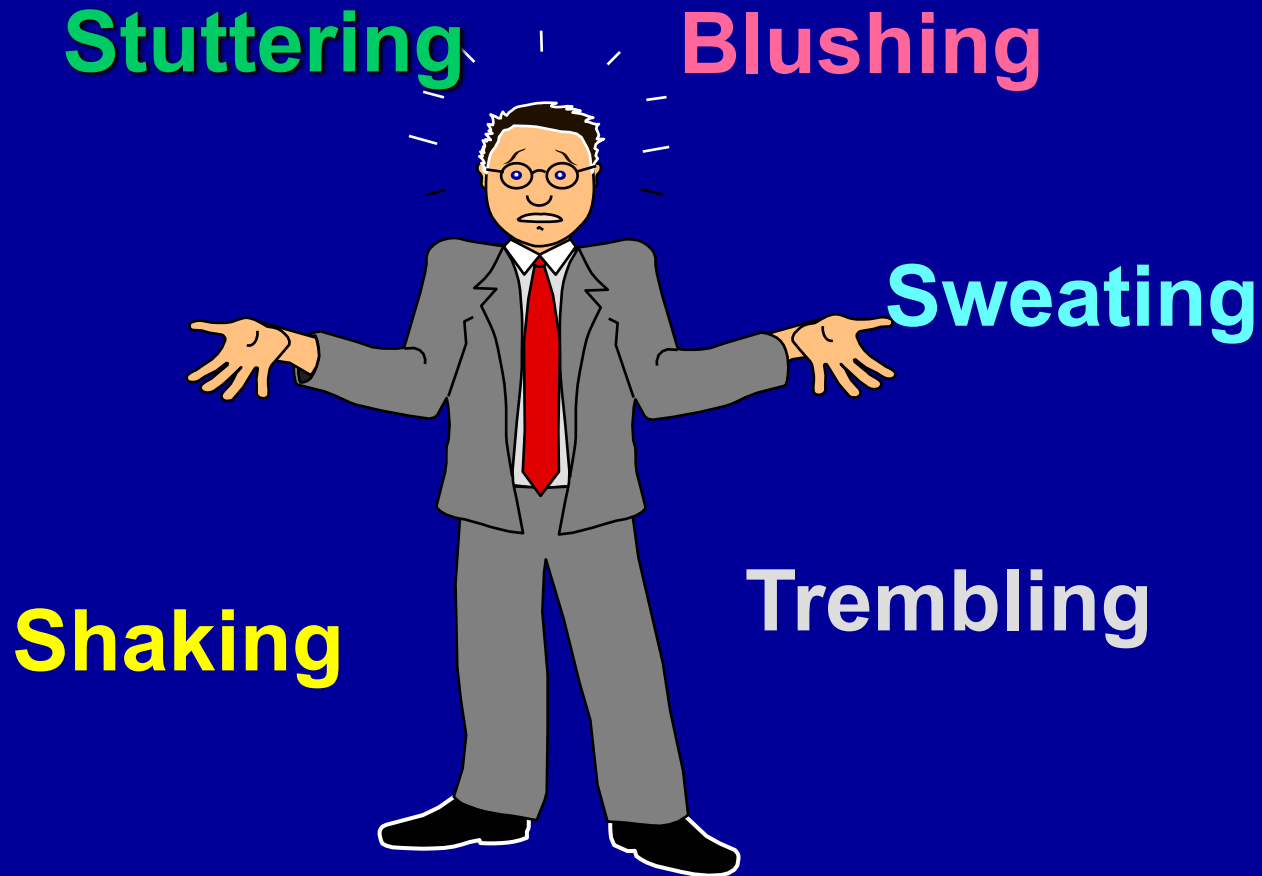
- **No significant difference in average trait anxiety scores in experienced scuba divers**

Colvard – data on file from 2002 survey/poll

# Trait Anxiety and Panic Behavior in Experienced Scuba Divers in 2003

- Year 2003 male experienced divers (n= 1,415)
- STPI Trait Anxiety (10 items) used to predict
- Reported panic rate in 2003 was 7% (96 of 1,415)
- **Trait Anxiety only predicted 20 (21% ) of 96 actual panics**
- **Failed to predict 76 (79%) of 96 actual panics**
- **1,149 of 1,415 (81%) accurate predictions using average trait score + 1 standard deviation to predict panic**
- Colvard – data on file from 2004 survey/poll

# Observable Physiological Signs of Anxiety



# “Spontaneous” Panic Attacks

- Panic disorder patients (N=43)
- 1,960 hours of 24-hour ambulatory monitoring
- 13 un-cued panic attacks
  
- *Before panic onset:*
  - < 60 minutes : sweating
  - <47 minutes : heart rate and breathing rate increase
  - Final minutes: shallow breathing or decreased ventilation with abrupt increase in pCO<sub>2</sub>
- *Panic:* heart racing, then increased tidal volume, then decreased pCO<sub>2</sub>

Meuret AE, Rosenfield D, Wilhelm FH, Zhou E, Conrad A, Ritz T, Roth WT. Biol Psychiatry. 2011 Nov 15; 70(10); 985-91.

# Pre-Dive Behavioral Signs

Unusually quiet and withdrawn  
Excessive talking  
Increased or decreased activity  
Gallows humor  
Forgetfulness  
Stalling  
Tardiness or don't feel well  
Mental Errors  
Extreme Cockiness or bravado  
Irritability



# In-water Signs of Diver Stress



# In-Water Signs

Rapid Breathing or Difficult Breathing

The “Wide-Eyed” Look

Inefficient Swimming

Clinging and Clambering

Fixation and Perceptual Narrowing

Sudden Surfacing

High Treading/Trashing/Agitation

Equipment Rejection

# Post-dive Signs

Head straight for the bar

Leave dive buddy behind

Turn in their equipment early

Try to sell their equipment on EBay

No longer have time to dive

Endless reasons not to dive

# ***Part 2 – Techniques for Panic Prevention & Control***

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**STOP**

***BREATHE***

**THINK**

**ACT**

# Trait Anxiety Predicts Panic Behavior in Beginning Scuba Diving Students

- 42 students in 4 month course
- Pre-instruction STAI Trait Anxiety
- 35 of 42 (83%) accurate predictions using a trait score + 1 stnd dev above mean
- Predicted 64% of actual panics
- Therefore, panic behavior can be predicted in beginning students

Morgan WP, Raglin JS, O'Connor PJ , Int J Sports Med 2004: 25

# Panic Prevention Program\*

(Primarily for Scuba Diving Students)

1. Information about Panic
2. Calming Response (Breath Control)
3. Mental Rehearsal of Ditch-n-don
4. Systematic Relaxation Training

Tom Griffiths, EdD, studied anxiety & panic in dive students and developed this program for high trait anxiety students in 1980's.

*\*Free MP3 files available at [www.DivePsych.com](http://www.DivePsych.com)*

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(Primarily for Scuba Diving Students)

Calming Response (Breath Control)

*Breathe like a baby...*  
with your belly and diaphragm

Tom Griffiths, EdD, studied anxiety & panic in dive students and developed this program for high trait anxiety students in 1980's.

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# Face Fears in Training

Stress Inoculation

Systematic Desensitization  
to overcome fears

Prolonged Exposure and Response  
Prevention (to overcome phobias)

# Stress Inoculation

- Thousands of unforeseen underwater situations are awaiting divers.
- All such situations hardly imagined.
- Training divers "in advance"? Not possible?!

# Stress Inoculation

- **REPETITIVE TRAINING**
- Provides "EXPERIENCE" coping with problems in a "realistic", but controlled environment
- Provides better outcomes when real danger shows up

# Face Fears in Training

Systematic Desensitization  
to overcome fears

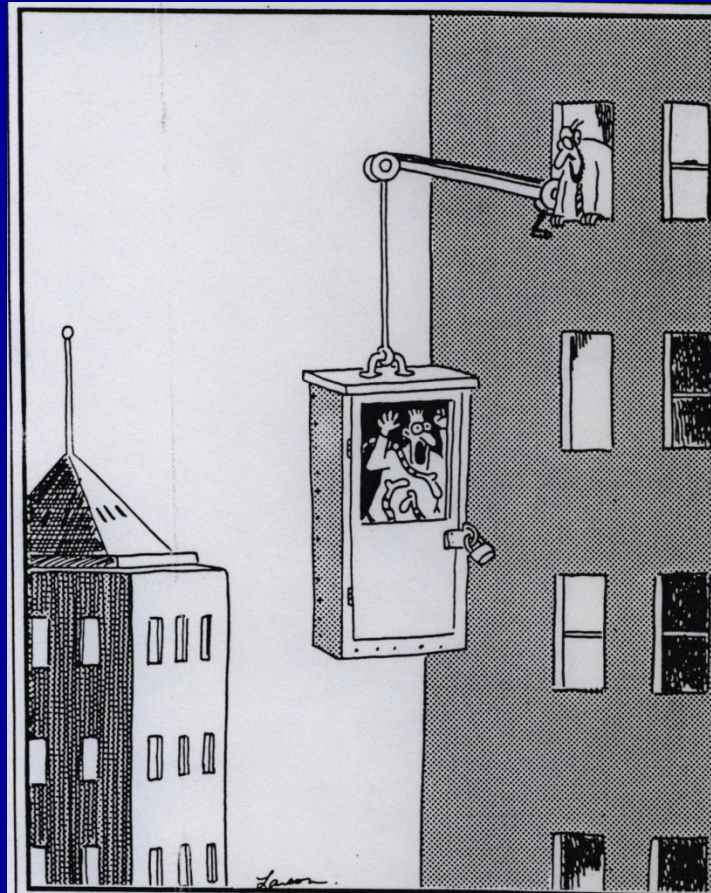
# Systematic Desensitization to overcome fears



# Face Fears in Training

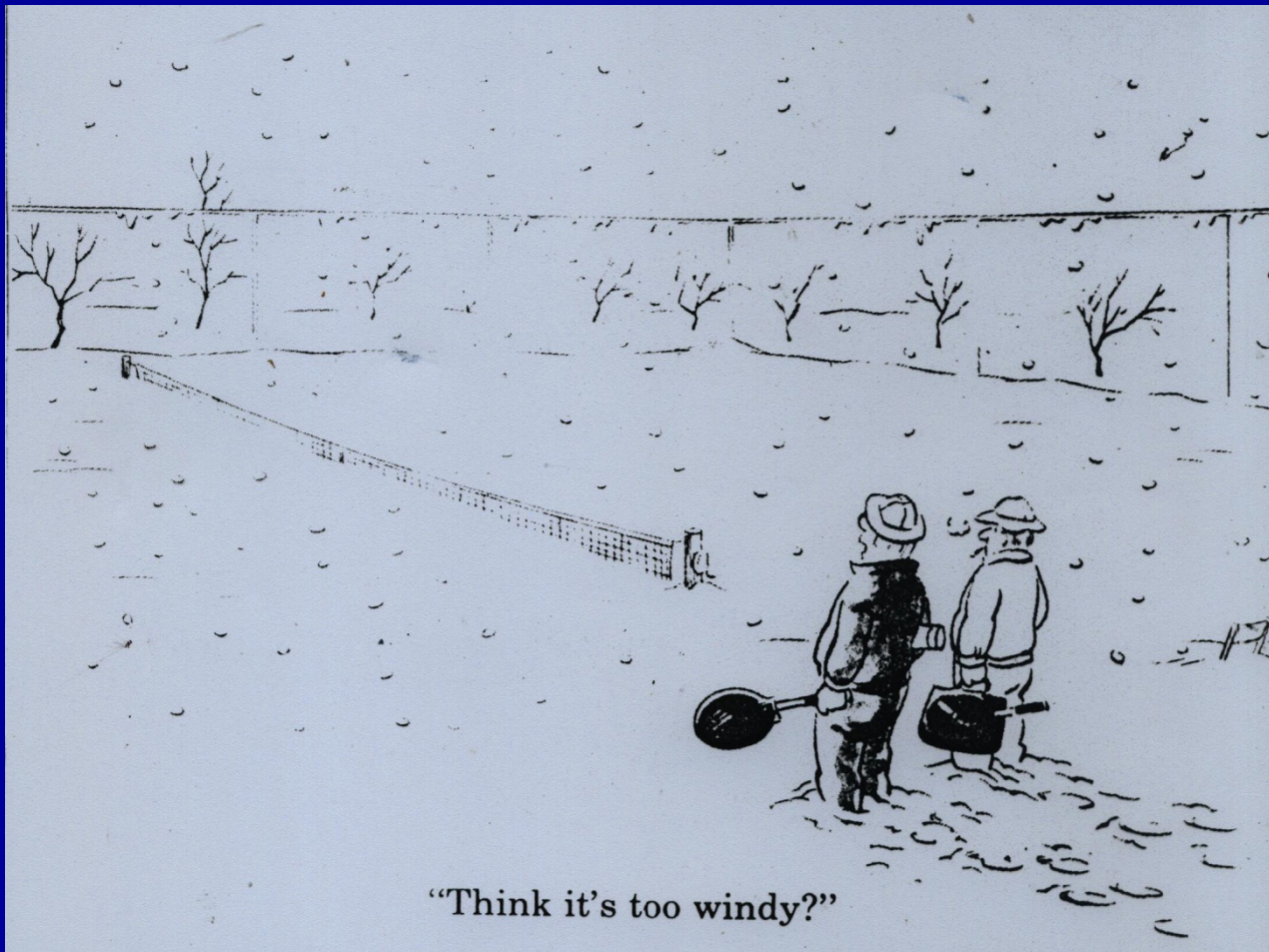
Prolonged exposure and  
response prevention to  
overcome phobias

# Prolonged Exposure & Response Prevention



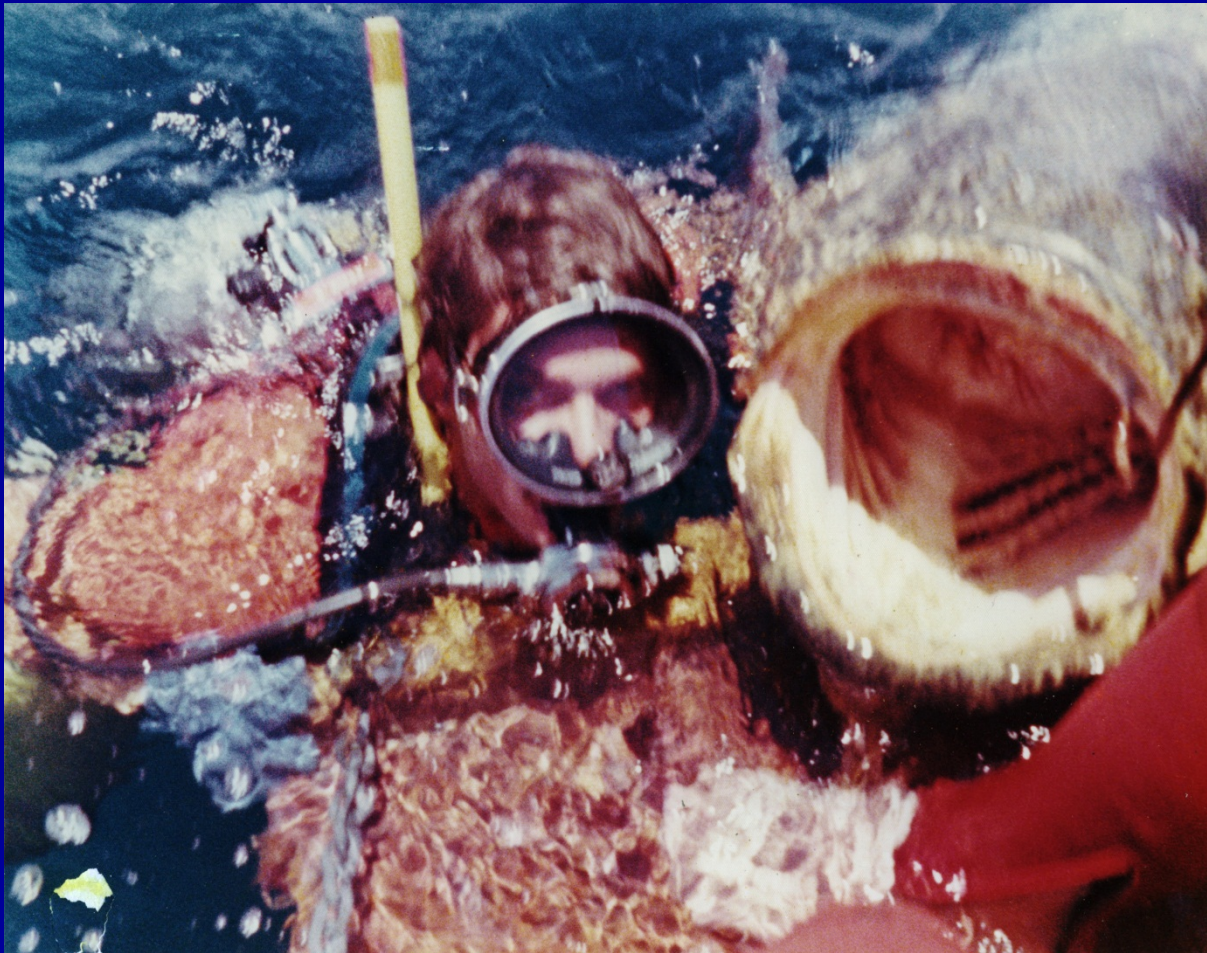
Professor Gallagher and his controversial technique of simultaneously confronting the fear of heights, snakes, and the dark.

# Dive Site Briefing





# Question: Is he having fun?



# Question: Is he having fun?



# Question: Is she having fun?



# Cathy Church says,

- “The desire to dive must be your own.
- There must be a strong, internal pull toward diving to overcome strong fear.
- It can’t be done by someone pushing you.”

Answer:  
Now she is having fun...



# Extra Slides

**STOP**

*Breathe like a baby...*

**THINK**

**ACT**

Question:

Is recreational diving supposed to be fun?

Answer:

**YES**



**STOP**

*Breathe like a baby...*

**THINK**

**ACT**

***Want more tank air and  
bottom time for your  
money?***

Breathe like a baby...

***Want more air for just  
one more shot?***

Breathe like a baby...

I dive to see  
...*"the works of the LORD,  
His wonderful deeds in the deep."*  
*Psalm 107: 24 (NIV)*



# ONE OR MORE PANIC DIVES CONSIDERING H/O PRE-DIVING PANIC

45% of Males - h/o pre-diving panic\*

20% of Males - no h/o pre-diving panic\*

\*P < 0.0001 Two-sample t-test between percents

Odds Ratio = 2.3 if h/o pre-diving panic

56% of Females - h/o pre-diving panic\*

33% of Females - no h/o pre-diving panic\*

\*P < 0.0001 Two-sample t-test between percents

Odds Ratio = 1.6 if h/o pre-diving panic

# Relative Risk of First Panic During Dive in the Presence of the Following

(Colvard – 2000 survey data on file)

Top 6 Relative Risks	Males	Females

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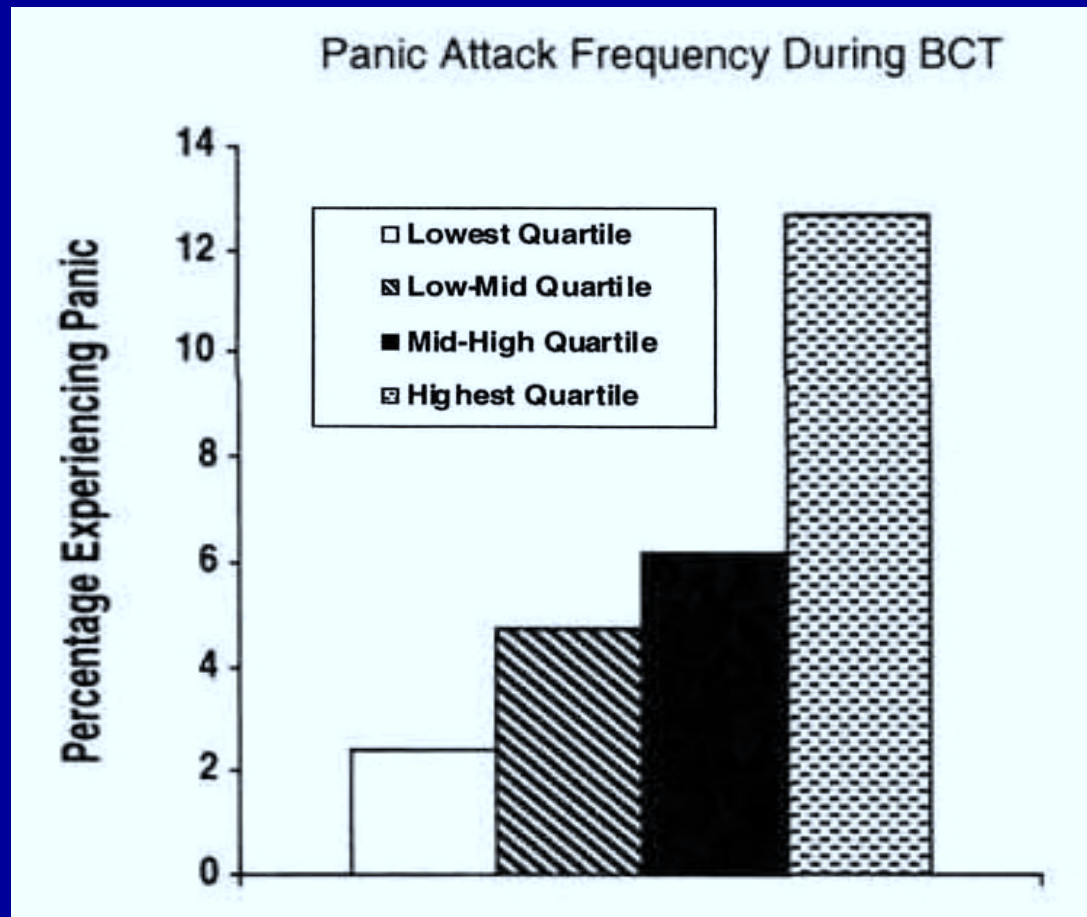
# Anxiety Sensitivity

- The extent to which individuals fear they will be harmed by anxiety-related bodily sensations
- *Examples:*
  - Racing heart
  - Dizziness
  - Nausea or stomach ache
  - Shortness of breath

# The Role of Anxiety Sensitivity in the Pathogenesis of Panic: Prospective Evaluation of Spontaneous Panic Attacks During Acute Stress

- USAF Academy Cadets ( $N = 1,172$ )
  - 5-week stressful military basic training
  - Anxiety Sensitivity Index (ASI) scores
  - Controlled for a h/o panic attacks and trait anxiety (STAI)
- 
- Schmidt N, Lerew D and Jackson R, *Journal of Abnormal Psychology* 1997, Vol. 106, No. 3. 355-364

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