IQ PROCEEDINGS

INTERNATIONAL CONFERENCE ON UNDERWATER EDUCATION
ICUE 2018
LONG BEACH, CALIFORNIA - JUNE 23 & 24

"DIVE SAFETY THROUGH EDUCATION"

Proceedings from the International Conference on Underwater Education
ICUE 2018, Long Beach, California – June 23 & 24
"Dive Safety Through Education"

IQ 2018 Proceedings

Mauritius Valente Bell – *Scientific Dive Operations in the Mesophotic Zone*

Please contact the speaker directly for information regarding this seminar.

Jonathan Bird – *Bringing the Underwater World Alive for the Next Generation of Divers*

Please contact the speaker directly for information regarding this seminar.

Jeffrey Bozanic – *Caves Project: In Search of Ancient Travelers*

Please contact the speaker directly for information regarding this seminar.

Life in the Fast Lane

by Michael N Emmerman

When driving on a highway, do you find yourself in the fast lane or passing lane more often than not? Do you drive at a speed somewhat above the limit but not so much above the Limit that you think the police will leave you alone? When it starts to rain, do you slow down and move into the middle or right lane? Have you ever stayed in the fast lane when it was raining and lose control of the car for a second or two because your ability to steer was affected by a puddle of water? After losing control for a second or two, did you stay in the fast lane? If you are the driver who lives in the fast lane and does not slow down when it starts to rain, you may have a problem called a lack of impulse control. If you are the driver who still does not slow down after losing control of the car, you may have an additional problem called a lack of mortal fear. These personality traits can contribute to the death of *drivers.....* and *divers.*

A great number of my friends in the diving community share a common personality profile. Somewhere in our past (or present) we drove motorcycles, raced cars (legally or on the streets), piloted aircraft, tried skydiving, etc. Many of us also share a common reaction to changes in our environment. For example, when driving on a highway, we will tend to drive at a speed higher than the posted limit, but just under the speed that we think the police will not tolerate. When it starts to rain or snow, and everyone else is slowing down, we move into the left lane and push past the crowd. Why do we do this? Possibly because many of us consider ourselves explorers and adventurers. We think that we will get away with these actions because *"we are a cut above the average human."* We are jolted back into reality when the rain or snow catches our tires and forces us out of control for a second or *two;* but a few moments later, when all is well again, we consider that another small *test of our abilities* has been passed successfully.

A sociologist told me that when someone takes these kinds of risks, it is called a *"lack of impulse control."* In layman's terms, this means doing something before considering all of the possible consequences of that action. What does this have to do with deep diving accidents? I have a theory. After debriefing many dive accident victims over several years, and witnesses in cases of fatalities, I could not understand why some of these divers took certain actions during a dive. For example, why did one diver decide to make an arduous dive in cold water to depths greater than 200 feet with tanks that contained an inadequate supply of a breathing mixture? Why did another diver make a dive to a depth far greater than that allowed by dictate of his Nitrox gas mix? These "highly trained" and "highly experienced" divers obviously did not consider all of the possible consequences of their actions. In both of these cases, the divers died.

I believe that some of us have difficulty in controlling our impulses. More significantly, however, we may also be combining what I will call a *"lack of mortal fear"* with this difficulty of impulse control. In other words, we disregard the potential of death as a possible outcome of our actions. When highly trained divers take actions that seem to violate most standards of training, the only rationale for such actions must be a failure of our inherent desire for self-preservation. An example of this would be the diver who used a penetration line to explore a wreck at a depth of 230 feet, but did not use a "jump" line while inside the wreck (he had three "jump" line reels with him!). This action may have contributed to his death during this dive.

I have a suggestion for all divers who can see themselves in the "fast lane" personality profile. Whenever you are about to take an action during a dive, take a look at one of your gauges and picture the image of someone you love or someone who loves you on the face of the gauge. Judge your next move as though your life depended on its outcome. Remember, if you die, you have nothing to worry about any more; however, your loved ones will "live" with your death for the rest of their lives.

All of the above is strictly my **opinion.** I am thankful to Dr. Jennifer Hunt, who was very helpful to me while researching the psychological profiles of dive accident victims. The issues raised in this article require a great deal of investigation and study. Who knows? Someday, a psychological work-up may prove as valuable as a medical exam in screening divers.

Michael N Emmerman is the Director of the Special Operations Support Group, a New York City based research and advisory organization supporting the diving and law enforcement communities. Mike can be reached at Emmerman@nb.com

Mark Gresham – *Cylinder Safe Handling Practices*

Please contact the speaker directly for information regarding this seminar.

Walter "Butch" Hendrick – *Leadership Rescue for Dive Leaders*

Please contact the speaker directly for information regarding this seminar.

Brittany Novick – *Divers as Educators: Successful Strategies for Teaching Marine Conservation*

Please contact the speaker directly for information regarding this seminar.

Dan Orr – *Does Scuba Diving Have a Retirement Age?*

Please contact the speaker directly for information regarding this seminar.

NAUI ~ ICUE ~ IQ

INTERNATIONAL CONFERENCE OF UNDERWATER EDUCATORS

By
Zale Parry

A touch of history...No nuclear fusion, weather wars, or geoengineering, just ICUE for you. This Continued Education today can be logged as NAUI IQUE 2018.
The program is "RESCUE and SAFETY".

A look back ~ A look ahead! It is hardly necessary for me to say this Association had moved from a time of humble beginnings to a vast, influential strength with prestige.

Once upon a time ~ it has been said that if we do not remember where we came from, we will not long be where we are today. From now on in, most of us have a lot less of our future and more of our past.

For you younger ones, you have a head start to take life's journey once and then stuff more study with fun to go around again.

For me, life looks very different at 85 than it did at 25. I'm confident it is a natural thing as we age to grow more introspective and more deliberate with what time we have left. In my youth, life was a smorgasbord and, like most, I wanted to sample everything.

As a NAUI Instructor, I followed the schedules, rules and attended some IQUEs. There is always a beginning to everything. Catch your breath for a brief history here.

NAUI - ICUE - IQ (continued)

Realize when NAUI began Black Jack chewing gum and Cracker Jack with a toy inside the box were still available. The Sears Catalogue was in existence.
Telephone booths were everywhere. The cost for a call was a dime. Most of all, typewriters were in all sizes and speeds. I know. I used a manual Royal and two IBM types. Many of our newsletters and flyers were mimeographed with purple ink. Hurray! The computer arrived approximately 20 years later!

We are in the 1960's.

NAUI's first Instructor Certification Course (ICC) was directed by Albert A.Tillman and lasted six days. Fifty of the 72 candidates were certified. Those fifty Instructors were similar to prophets from different states and lands. As time went on Districts and Branches were formed to answer to NAUI Headquarters. No one was paid for a while.

The NAUI Instructor Course was an extension of the Los Angeles County Instructors Course~ which was a tough one. We could have been
programmed for the Military Navy Frogmen Unit or U.S. Marine SEALS of today. It was run similar to a Boot Camp with high surf and bail outs. Nothing easy. The text material was a ream of scientific, technology, education and mathematics. What we understand as a "STEM" Program in today's world of studies.To know and express yourself clearly, but most important one had better be a super swimmer.

NAUI - ICUE - IQ (continued)

SKIN DIVER Magazine supported NAUI with office space and a page in each issue which replaced "The Instructor's Corner" and provided information on courses and activities. Tillman edited the "NAUI Page" and became first General Manager of the Association. When Tillman left for UNEXSO, Art Ullrich became the General Manager.

Headquarters moved from *SKIN DIVER* Magazine's location to a garage, then to a six-unit office building where it further expanded from one office to the entire facility.

During the ensuing years, NAUI continued its growth and development. By 1964 NAUI NEWS began publication with Hank Halliday as the editor. It was recognized as diving education's serious professional journal. Fast forward a few years when NAUI's *SOURCES* Magazine edited by Peter Oliver, eventually became the NAUI Logistical and Administrative informant.

Ah. Then in 1968 NAUI ICUE was born. It was the major educationally-oriented conference in diving.

Three NAUI instructors joined forces to create and organize the First International Conference of Underwater Educators (ICUE) or known as IQ in 1968. They were: John Reseck (NAUI #949), Larry Cushman (NAUI #206) and Dr.Glen Egstrom (NAUI #937).
NAUI ICUE was the gem of the Association. We gathered to learn something new. Something we would add to our own curriculum for teaching ~and friendships formed.

NAUI - ICUE - IQ (continued)

That same year 1968, our first IQUE was held at Santa Ana, CA, College. It was Spring break, the pool was available. John Reseck was the Dive Officer there who notified as many NAUI Instructors who might be available to begin the New Program to be named IQUE. A good number of those who were contacted did attend.

The lesson from that gathering I remembered most. It had to do with the use of the snorkel when free diving.

Fins, mask and snorkel were required. Listen carefully.

When you start to surface, naturally your snorkel will be full of water, begin exhaling at a medium pace so that when you reach the surface,
your snorkel will be empty. It will be easy breathing air immediately. You are not a geyser that blows a volume of water when you surface. Each of us had to prove our worth by diving to the bottom of the pool and surfacing with polite breathing without the breath-push of an exhalation that sprayed like a fountain.

At another ICUE program, one of our NAUI Instructor's opened the day by parachuting (today it is sky diving) into the center of the swimming pool.
That was a clever splash to start. WOW!

From September of 1970 NAUI expanded across the ocean by holding the First Course in Japan.

NAUI - ICUE - IQ (continued)

The time was May 1-8-1971.
NAUI held its First Diving Medicine Course designed to teach physicians about the medical aspects of diving. The course was held at UNEXSO in the Bahamas. It was taught by Dr. George Bond, Dr. Edward Tucker and Dr. John Cements who were renowned diving physicians. The course was open only to physicians and basic scuba instruction was available to those who weren't already certified.

The International aspects of NAUI continued to grow. NAUI CANADA was formed in 1972.

That same year, 1972, NAUI became the United States representative to the Technical Committee of the World Underwater Federation (CMAS). Global expansion continued throughout the 1970's. A NAUI instructor named Dusty Rhodes (NAUI #179) had been living in Thailand for some time and teaching YMCA instructor courses. At last a new NAUI branch administration came in to teach ICCs. NAUI THAILAND became a full and active existence. This kind of expansion became a common and full practice throughout the world.

September 1974 put MEXICO on the map for the First NAUI International Conference Course.

Major changes in instructor certification took place in 1974. The Instructor Certification Course (ICC) was replaced with a two step Instructor Qualification Course (IQC) to certify Assistant Instructors (AI's) followed by an Instructor

NAUI - ICUE - IQ (continued)

Training Course (ITC) to full certified instructors. The main water skill testing was now done in the IQC, while more time was focused on training instructors to teach in the ITC instead of the time spent testing their basic skills.
Subjects at the IQUE Conferences dealt with New Developments on: How to Teach; Human Physiology; Instructor Liability; Specialty Diving; Buoyancy Control; Use of Drugs; Renewing CPR Procedures without the precious Annie dummy-doll; Maintaining Involvement; to Diving Travel and the lists continue.

The door to women opened a bit more in the 1970's. Pioneers like Helen Drew, Nancy Gill, Noureen Rouse and I were ahead of the time.
Jeanne Bear Sleeper came into NAUI Headquarters from 1975 to 1980 as Director of Instructor Training. She was motivated by *Sea Hunt* to become a diver and eventually began certifying at the University of Minnesota. In reality, Jeanne became the FIRST FEMALE Instructor Training Course Director and managed the NAUI Midwest Branch. She established women as great potential leaders for NAUI. More importantly, diving in general would see women gain prominence and respect.

There were times when NAUI was combating diver drop out.
There were times when there were management changes.
There were times when there were too many programs and too little money.
There was a time in 1970 when NAUI went broke.
Bill High (NAUI #175) sent $2,000 out of his own pocket to make payroll and keep Headquarters door open.

NAUI - ICUE ~ IQ (continued)

NAUI was and still is pure and clean from a start of a few divers with a real caring about people and protecting diving as a safe sport.

Today NAUI has redesigned training products to provide better value at lower costs; and translated more NAUI textbooks, eLearning and Marketing content than ever before. In addition, the new online member platform NAUI CORE (Online training) for Certifications Recources and Educational material was launched this year. It delivers on a promise to provide NAUI members with a modern, comprehensive, and integrated online system to manage and certify NAUI divers. In a message to me, our NAUI Executive Director, Dallas Edmiston, explained further NAUI CORE provides a convenient hub were you will find the latest news about NAUI, manage your NAUI membership and access teaching resources.

NAUI Headquarters is stable and stabled in a fantastic beautiful building in Tampa, Florida. It's Board of Directors is light years ahead into the future. You know that or you would not be here today. NAUI (IQUE) is progressing every day. Its new name will be titled by the year it occurs.

Beside all the books and equipment NAUI leaders have a human side.
Jeanne Bear Sleeper's recollection ...an example of what fun-loving NAUI guys were.

NAUI - ICUE ~ IQ (continued)

I quote: "One of the funniest situations ever witnessed involving diving types was during IQ4 in Miami in 1972. At a party after the Saturday night film festival,
John Reseck boasted that he could LIFT any three men with only ONE hand. Glen Egstrom and two others in the room took the bait. Reseck had them lie down side-by-side on their back on the floor. Then he intertwined their arms and legs around each others so that they would "stay together".

After a bit of ceremonial huffing and puffing, Reseck stood over Egstrom, who was in the middle, grabbed his belt, and like a flash unzipped Egstrom's fly and poured a drink in. And you know, Reseck was able to lift all three men with only one hand! I never laughed so hard or seen Egstrom so flustered, Jeanne continued. I don't know if Egstrom has ever found the opportunity to pay Reseck back yet, as he promised. When he does it will be good."

MARVEL AT NAUI TODAY!

I have two stories to express about RESCUE and SAFETY. They are real and give me chills to tell the details. Scuba is always a teaching/learning helpful tool. These actual happenings did not have scuba equipment as a source of rescue. Safety is always in mind. It is **the quick, sharp attitude with Adrenalin at 100% to proceed.**

NAUI - ICUE - IQ (continued)

The Scene: Suburban living in the San Fernando Valley, Ca. There are three to four swimming pools on every block. Our house had a 20' x 40' pool we used often. It is a safe neighborhood. Young children play on the front lawns while some Mothers gardened or sit on the grass just relaxing while watching the kids play. It was the era when few Mothers worked outside the home.

It is about ten o'clock in the morning. I know my 4-year old Margaret is in the front yard. I saw her leave.
All of a sudden I hear, "Mother. Mother."

I answered with surprise. "Yes, I am here."
She has come into the living room through the sliding door to the patio.

"My friend is on the bottom of the pool and won't come up."
I raced to her and said, "Show me."
We ran to the edge of the deck. There near the drain lying on her side at the bottom of the pool was a little girl about Margaret's size.
In the biggest hurry one can imagine, I removed my flip-flops and ran around the diving board stansion to get to the metal ladder. I am wearing my tennis shorts and top. I entered the water going front face down the ladder, actually slid. One breath and I was at the bottom. With two hands, I picked up this thin child, then tucked her securely in my right arm at the surface. Using my left arm, I grabbed the ladder. With all my might I was able to get to the top of it to take a step to the deck.

NAUI - ICUE - IQ (continued)

I cradled her with my right arm and chest, tilted her chin up and gave a mouth-to-mouth breath. Tipped her head away from me and nothing came out of her mouth. I am making my way with fast steps to get to the phone. At the same time, between breaths, I am directing Margaret. "Go Get Her Mother." Another tilt of the chin and breath. Turned her head away from me. Ah! A little water dribbled out. "Go Get Her Mother." (Margaret left.)

Walked fast around the dive board stansion. Stopped. Tilt the chin, another breath. Turned her head away from me. Good! A little more water dribbled out of her mouth. (I am thinking, who is this little girl? She never wiggled or made an attempt to move.) One step and we are on the patio. Tilt the chin. Breath then turn her head away from me. Another step. We are through the door into the living room. Ah, closer to telephone. That last breath was the coupe de gra.

Little girl released a lot of water and vomited. Then she started crying so loudly with repeated words of: "My new hair cut." She reached for her hair on the right side of her head. "My new hair cut."

"Your hair cut is very pretty," I told her.

Now the telephone is on the floor, I am kneeling holding this child who wouldn't stop crying. I took the receiver off the cradle, never listened for a dial tone. It is a rotary type. With my left hand, I dialed the nine and then the ones.

"Fire Department, please. We have had a swimming pool incident. Small child."

Fire Department answered the call with Battalion Something. We have had a swimming pool incident. I gave the address.

NAUI - ICUE - IQ (continued)

Firefighter asked, "Is that the child I hear crying?"
"Yes."
He continued, "Don't worry. We are on our way."

While waiting almost minutes, I found a blanket. Wrapped the little one in it. Wiped around her mouth with the corner of it.
She never stopped crying. She just repeated the phrase about her "New hair cut."
I asked her, "What is your name?"
No answer.
"How old are you?"
She showed me her hand ~ five fingers.
She never squirmed away. I just held her comfortably until the firefighter walked through the open front door.
He immediately took her from my hold and placed her over his right shoulder then hurried out to the waiting Fire Department's Ambulance parked at the curb.

It was then I saw my Margaret walking with a lady on the sidewalk approaching our driveway. I heard a communication to the lady from the firefighter about "follow us to hospital".

I sat on the front step of our porch. Margaret came to me. We sat together. I asked Margaret to tell me the story about her friend falling into the pool.
She said that I really wanted her to see our pool. She doesn't have one in her back yard. Then she said that her friend reached for the swan and fell in. The swan is a plastic air floating pool toy that followed the circulation of the water.

Well, I never scolded Margaret. She did a terrific job without ever knowing anyone who didn't know how to swim. And, to this day, I never learned the little girl's name.

She was a new friend. She and her family were new in the neighborhood. We didn't see her ever again.

Next Rescue:

Here is a surprising true tale of Rescue & Safety few of you know because it has never been published. Many of my friends lived in Malibu Beach, California. I visited often. By now my little one, Margaret enjoyed the beach as much as I. Young children could always be found playing in the tide pools or building sand castles. My child was no different. Malibu was the hot spot for many working or renting folks especially with children.

Here's the scene:
Charleston Heston and his family were on a beach blanket fairly close to where my friend Sally and I had our blanket. Sally's three girls and the Heston children were about the same age. All were busy kids at the beach.

It was a very warm day as we baked there. I decided to go for a swim beyond the breakers to cool off. In the water about 20 feet away from me were two young men. The thin one was making every effort to get his somewhat larger friend unto an air mattress they had with them. I did a few

breast strokes toward them. They saw me coming close.
Would you like some help, I asked?
In unison both gave a loud, "Yes".
So, I asked the thin one if he would steady the air mattress on the side of it. "Hold it tight", I requested.
His friend was on the other side of the mattress.
I will go underwater to boost your friend unto the matt.
And...that's exactly what I did.
The thin young lad moved to the end of the matt and began kicking toward shore. I felt secure in my thinking that the thin one knew how to swim.
I followed them to the shore to be sure they would make it safely.

Well, when I returned to the blanket dripping wet, the grown-ups were watching every move of the rescue.

I was asked, "Do you know who those guys were?"
"No".
"Just two young guys who were drifting further away from shore."
"Well, if you don't know, the larger guy was Elvis Presley."

"That's Nice. Who is Elvis Presley?"
At home my husband and I always had classical music playing. One could hear Tchaikovsky, Rachmaninoff not Elvis Presley.
So go figure Never too late to learn.

Few people knew Elvis created an insular life populated by "the guys", his Memphis mafia of musicians, bodyguards and those who hung-on to cater to the whims of the "King". Also he had rented the beach house on the other side of my friend's house. How close is that? Unknowing the life guard, Elvis and his friend were saved.

Much later I enjoyed hearing Elvis sing, especially, the song, "Love Me Tender".

Check the clock: There is so much to share today.
The human body follows the "Rule of Threes".
You can survive three minutes without air ~
Three hours without shelter in extreme cold ~
Three days without water and ~
Three weeks without food.
When we die, no one remembers after three years!

You have been a wonderful audience.
Thank you.

SEA HUNT 60 YEARS IN 60 MINUTES

The SEA HUNT television series came along at a point in time when television itself was just emerging as the great mass entertainment media of all time and the viewing public including your friends and neighbors were extremely receptive to the portrayal of lone wolf type of heroes. There were near a handful of stations to choose from ABC, NBC, CBS, and Public Broadcasting. All analogue at the time and free. Today we may be capable of choosing over 100 channels because of the digital invention of everything.

Westerns were extremely popular. *Sea Hunt* in many ways was an underwater Western movie. It also was at a time when scuba diving was just starting to pick up significant number of people. The personal ownership of your own tank and regulator had become part of the American life-style.

Sea Hunt was not photographed in color, color film and processing were too expensive. It didn't matter. For those who watched felt the adventure, the unknown aspect and the challenge of a new sport. Disney brought the color, yet "*Uncle Milty*" with his Texaco half-hour, and "*I Love Lucy*" with her humorous episodes ran second to our beloved *SeaHunt.*

So now, emerging from the austerity of WW II, *SKIN DIVER* Magazine was born, breath-hold diving was still the rage for the dinner catch. Diving clubs were popping up throughout the states. And, the Underwater Demolition Team (UDT) Unit One on Coronado Island, California, was Operating under Cmdr. Francis Douglas Fane.

You know I was very involved in diving from its start. Breathhold was easy since I was dedicated to synchronized swimming in school. I met Parry Bivens on a blind date, we fell in love, built a 22-foot Jeffries ocean boat, and then we married. Yup, that's the way things worked out. We spent days underwater.

As a Berkeley Structural Engineer, Scientist and medical student to boot, Parry designed and built two portable recompression/decompression chambers to be used as a safety factor for treatment of the bends if needed by civilians.

That was good, I thought! The UDT needs one. But after talking with Cmdr. Fane, he couldn't convince the United States Department of the Navy that he not only <u>needed</u> a chamber for his Frogmen's safety factor, he <u>wanted</u> one. The Navy Department had no funds for a chamber. Big disappointment for him and for us.

Well, hospitals throughout the United States weren't interested in recompression/decompression chambers either. Doctors didn't know or care to know about decompression sickness. We were just too early in the game to save lives.

As it was the U.S. Atomic Energy Commission purchased the single-lock chamber for Eniwetok in the Marshall Islands to be used by our military who used their R & R sport diving.
The other, a double-lock chamber, we sold to an off-shore oil drilling company off Maracaibo, Venezuela. That was 1957 the end of our Scientific Underwater Research Enterprise (SURE).

Sea Hunt's Producer, Ivan Tors, met Fane through my husband now Dr. Parry Bivens and me on another matter. Tors was very impressed with Fane. Tors asked in his heavy Hungarian accent, "Vot vill you do as a civilian, Doug?"
Fane, a rough and ready RED DOG, replied, "I'd probably get a boat and hire myself out...search, rescue, detective, stuff like that."

It wasn't long, Ivan Tors, who was a writer for Science Fiction Theater, produced Doug Fane's life story in the film, *Underwater Warrior*, with actor, Dan Daley, as Fane. I was Mrs Fane underwater. The film became the genesis for *Sea Hunt*.

Without demonstrating my acting or aquatic ability. I was hired by Tors over the telephone. I had just completed *Kingdom of the sea,* a Jack Douglas Production series with Col. John D. Craig. The next day after the phone call, I went to Tors office for an interview. All he asked was, "Do you vant to verk vit me?"
Of course, I said, "Yes, happy to work with you."

Then Tors began searching for an affordable, veteran actor, who was athletic to be the main character, Mike Nelson. There was Lloyd Bridges, a journeyman actor. Lloyd was interested in a Western series but Tors convinced him to work for him.

Lloyd was blonde, well-built, looked great in a wet bathing suit in the sun. Excellent athlete. Tennis was his game.

My first introduction to Lloyd Bridges was at Marineland of the Pacific for the first studio call for publicity photos. Lloyd was pleasant, a perfect gentleman and easy to work with for the day.

Lloyd was an authentic actor and an early Shakespearean actor, too. Was he a diver? NO. But he would often ask me as he was learning, "Am I doing this right?' He was a quick learner.

I was impressed with the attention he paid toward the professional way of doing diving. His major role of diving was done mainly in a tank on stage for the closeups. As an excellent swimmer the call sheet would have Lloyd in the sea especially surface shots on location.

So while Lloyd would be the perfect image of Mike Nelson on the surface and underwater closeups...veteran diver stand-in, Courtney Brown, would do the actual diving footage...**All of it.**

Enter Ricou Browning who was a graceful, strong swimmer, platform and underwater diver out of Florida waters. He doubled the actors filmed on location for the second unit. First unit most often was on stage in and around Hollywood which included the beaches and Catalina Island. Of course, Marineland of the Pacific was used at first.

Ricou really knew the territory of his State. He knew the owners of Silver Springs, Florida, where much of the underwater filming took place. Later we filmed in the Bahamas for a while.
Tors hired him to be their location diving expert. Ricou would eventually be the star in the *Creature From The Black Lagoon.*

SEA HUNT 60 YEARS IN 60 MINUTES (continued)

On Sunday we had access to the Everglades Speed Boat owned by Bill and Patty Boyett and did the pyramid act with three single water skiers. Imagine so much fun. I was the light-weight top turtle.

We received a lot of letters.
Throughout America, experienced divers found fault with some of the diving behavior of Mike Nelson. Notice no snorkels. They became popular in the mid 1950's. Mike Nelson didn't need a snorkel. "Hey! Why is he diving alone? How about "Always dive with a buddy?" Sometimes, the hero would leap in the water with one tank and then be seen swimming with two tanks at which the adult veteran divers would hoot. But the kids loved it, flaws and all.

The cast was set. In 1957 to be exact when CBS's *Sea Hunt* presented the adventures of Mike Nelson played by Lloyd Bridges, young girls and boys hurried home from school to finish homework, not to miss an episode. Vocations pertaining to the sea were conceived by watching *Sea Hunt*. It provided the most wholesome, exciting and educational series for a long run...not only in America but syndicated in 78 countries.

Sea Hunt continued to play on television through the 1970's around the world. It cruised along at rating's peak and was dearly missed by 15 million viewers a week when the last season ended. Today the entire series can be purchased on D.V.D.s.

Lloyd Bridges remained an inspiring hero in the public's minds and received many diving awards for creating a luring, exciting, ultimate-recruiting vehicle for the sport.

Soooo, Some people go to the HOLY LAND to believe. Some people go to HOLLYWOOD to make believe. We're going to HOLLYWOOD.

Next we have a video with the real action. What you see underwater really happened. It is a touch of *Sea Hunt* memories of the episodes that proved the 'damsel in distress' could be depended upon. I thank Mike Degruy for placing these segments on Bata Film just for me.

I hope these snippets of the early days bring back some endearing memories. Nothing in television underwater drama ever again approached *Sea Hunt's* influence. Yes, it was once upon a time. Hold it tight!

In closing I wish to express: There is an unspoken bond that withstands distance and time in the underwater community. I feel that closeness with each of you. Divers are that way.

You have been a fantastic audience!
Thank you.

ICUE

International Conference on Underwater Education

Breath Hold Tips & Techniques

NAUI® FREEDIVER

"Dive Safety Through Education"

ATLANTIS Philippines

Henderson DIVEWEAR

CALIFORNIA DIVING news

SCANDI DIVERS

DiveTraining™ THE MAGAZINE FOR NEW DIVERS & THEIR INSTRUCTORS®

A GOOD MANAGER IS ALWAYS LEARNING DIVECenter BUSINESS

SCUBA SHOW

Should I hold my breath?

Could I hurt myself?

Could I hurt someone else?

Proper Breathing Techniques

- Respiratory muscles
- Breathing Cycles
- Recovery Breathing

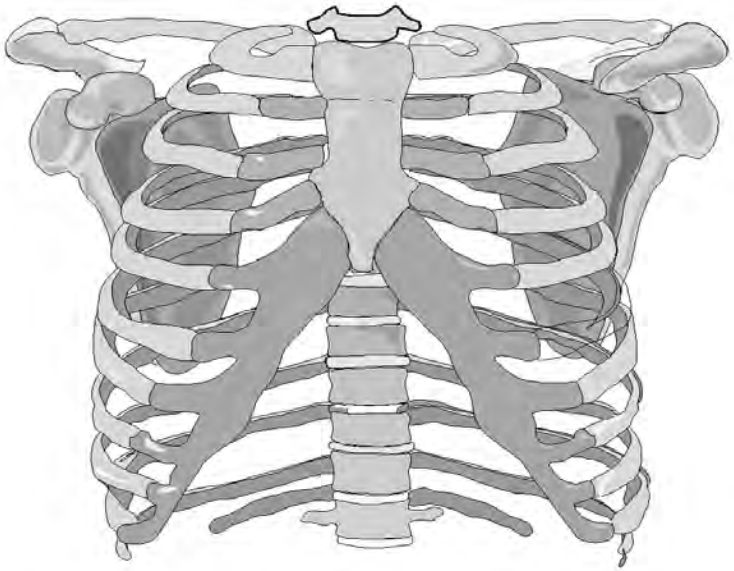
RESPIRATORY MUSCLES

BREATHING IS THE FOUNDATION

BALLOONS TRAPPED IN A CAGE

BREATHING IS PASSIVE AND RELAXED

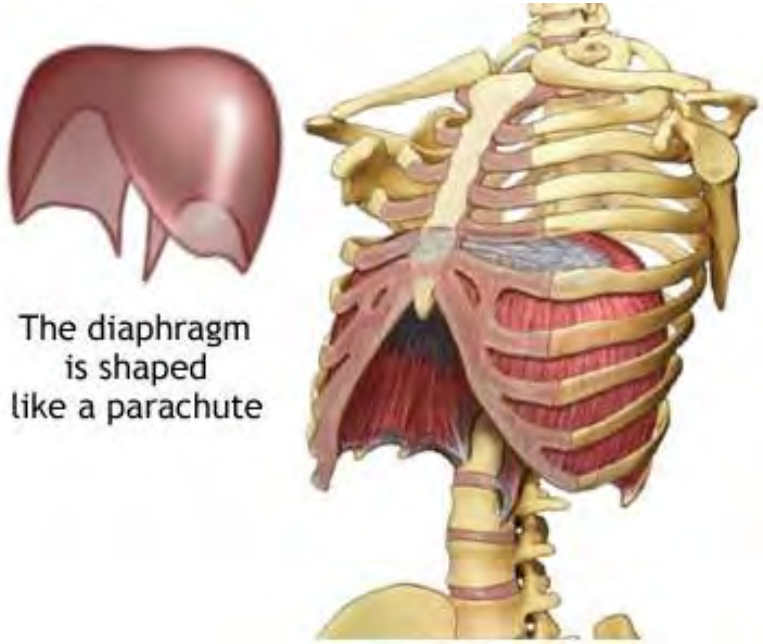
FLEXIBILITY VS. STRENGTH



Respiratory Muscles

STOMACH / DIAPHRAGM

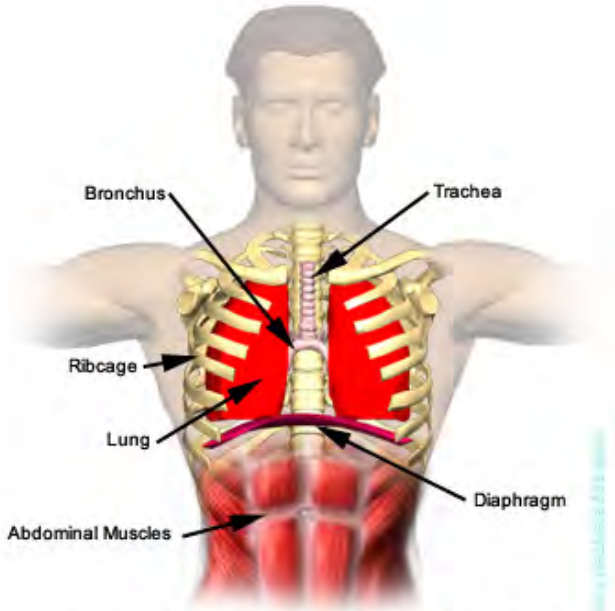
- GAS EXCHANGE AND SLOWING HEART RATE
- 2/3 BLOOD LOCATED IN LOWER 1/3 LUNG
- DIAPHRAGMATIC BREATHING DISPLACES GASTROINTESTINAL



Respiratory Muscles

CHEST / INTERCOSTAL

- TWO LAYERS:
  - OUTER (INHALATION)
  - INNER (EXHALATION)
- LOWER AND UPPER CHEST

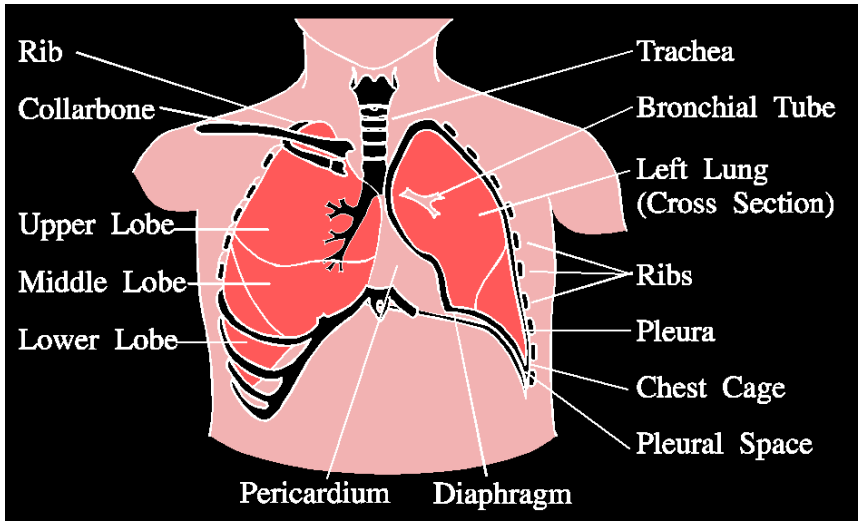


Breastplate has been removed to show Respiratory System

Respiratory Muscles

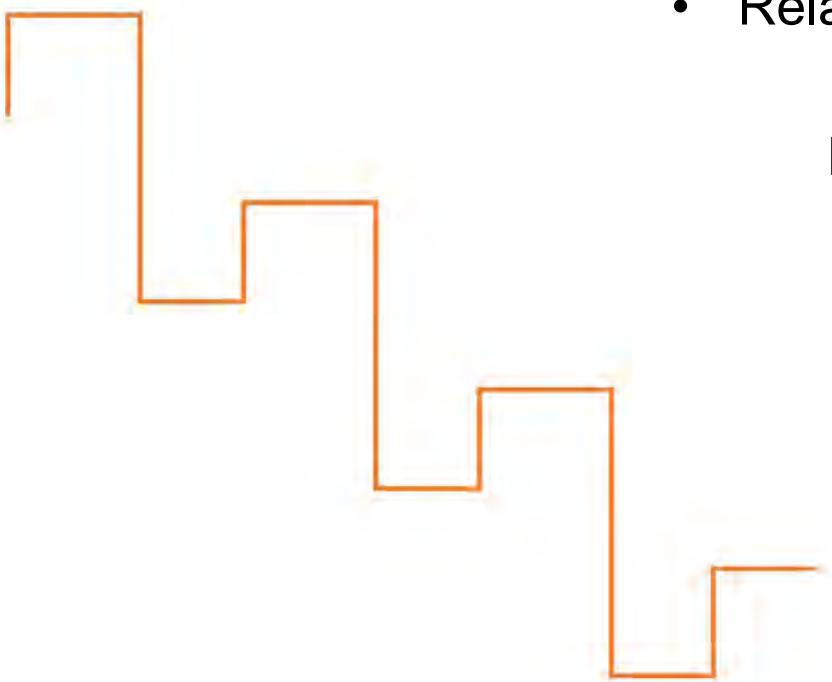
SHOULDER / SCALENE

- TOP OF SHOULDERS, PULLING LUNGS UPWARD
- PRIMARY VOLUME, NOT MUCH GAS EXCHANGE



Breathing Cycles

Ventilations



Ventilation Cycles:

- Diaphragm & lower chest
- Relaxed to slow heart rate

Inhalation	1-2 seconds
Pause	2 seconds
Exhalation	10 seconds
Pause	2 seconds

Breathing Cycles

Purging cycles (x5):

- Diaphragm and upper chest
- Removes CO2
  - Inhalation 1 second
  - Exhalation 4 second
- ‘Flickering candle at arms length’
- Maximum of 5 times

Peak Inhalation:

- For maximum volume
- Diaphragm - chest - shoulder - neck

Recovery Breathing

SIX MOST IMPORTANT BREATHS

HELPS PREVENT HYPOXIA DUE TO BLOOD PRESSURE LOSS

BREATH FROM UPPER CHEST

- INHALATION TO UPPER CHEST, EXHALE TO TIDAL VOLUME (MID VOLUME)

CLEANSING BREATHS

COACHED VISUAL & AUDIBLE

Ready?

- **1:00 VENT 1:00 STATIC**
- **3:00 VENT 2:00 STATIC**
- **4:00 VENT 2:30 STATIC**

"Dive Safety Through Education"

Cheryl Thacker – *Scientific Diving Past and Present*

Please contact the speaker directly for information regarding this seminar.

Andrea Zaferes – *Gear up for Contingencies*

Please contact the speaker directly for information regarding this seminar.

Risk Management and Insurance

DIVING & RISK MANAGEMENT

- BY ITS NATURE, DIVING IS A RISKY ACTIVITY
  - Human body is not designed to be underwater
- When combined with all the other types of risk that Doug Stracener mentioned, it makes good sense that we take steps to
  - Reduce risk through various risk mitigation initiatives
  - Protect ourselves against financial losses when things go wrong
- As that great philosopher Murphy once said

Anything that can go wrong, will go wrong

Objectives

- What type of insurance coverage do I need
- What is the difference between general liability and professional liability insurance
- How are the limits of coverage determined
- What can I do to protect myself
- Review and explain my obligations under NAUI's risk management handbook and the resources available to me as a NAUI member

Insurance

- First, a brief overview -
  - Professional Liability Insurance
    - Individual vs. Group
  - Commercial general liability insurance
  - Property & casualty insurance
  - Marine insurance
- Depending on your business, you may need other types of insurance
  - Worker's compensation
  - Director & officer liability
  - Other

Insurance

- About your insurance
  - Underwriters
  - Who is at risk
  - Proof of coverage
    - Declarations page
    - Certificate of insurance
  - Additional named insureds
- What do I need and where can I buy it?
  - NAUI sponsored program: http://www.diversalertnetwork.org/liability/

Insurance

- Professional Liability (PL) insurance
  - Term – generally one year
  - Policy limits – base coverage is $1 million / $2 million aggregate
  - Deductibles – most have -0-
  - Type policy- "claims made"
  - Past claim declaration
    - No claims / disclosure of past claims
  - Declarations
    - Truth of statements in application
    - Full disclosure / fraud warnings
    - Policy exclusions

Insurance

- Commercial General Liability (CGL) insurance
  - Term – generally one year
  - Policy limits – base coverage is $1 million / $2 million aggregate
  - Deductibles – most have some deductible - $1,000/event is common
  - Type policy - "occurrence based"
  - Past claim declarations / other declarations are same as for professional liability
- Property & Casualty / Marine insurance policies
  - Coverage tends to be less standardized (it varies more)
  - Designed to protect against risks not covered by PL or CGL policies

Riders / Endorsements

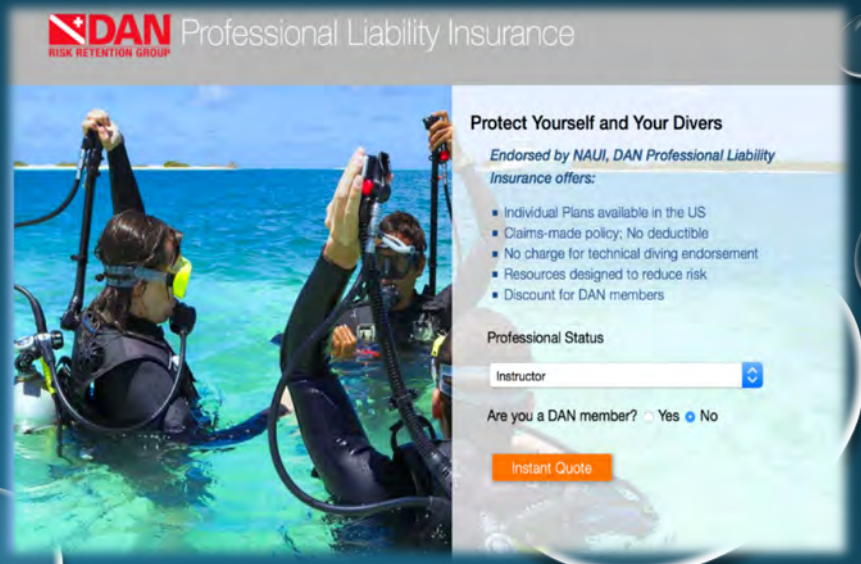
- Different dive professionals / businesses have different needs
  - Professional liability
    - Coverage for technical diving
    - Equipment liability endorsement
    - Rebreather endorsement - Must designate manufacturer / model
    - Excess coverage – increases limits to $2 million / $4 million
  - General liability
    - Coverage for lakes & quarries
    - Tour & travel agent liability endorsement
    - Employee benefits liability endorsement
    - Include additional locations (multiple places of business)

Risk mitigation

- Your insurance provider may offer various risk mitigation programs
- Recommendations include
  - Remain in compliance with all NAUI standards
  - Read and follow the guidelines provided in NAUI's risk management handbook
  - Use the current medical information forms and other documents related to release of liability, assumption of risk, etc.
  - Conduct a risk assessment of your diving practices
    - What can go wrong and how do I prevent it
  - Make sure your students and those who dive with you are covered by an insurance policy which provides protection for the expenses of a diving accident

Insurance

- Where available, NAUI members are encouraged to purchase NAUI sponsored insurance to ensure quality coverage that protects both the member and their Association.



http://www.diversalertnetwork.org/liability/

RISK MANAGEMENT AND INSURANCE

RISK MANAGEMENT HANDBOOK

NAUI Business Institute

Risk Management Handbook

- Introduction
  - The handbook is a source of information, recommendations, requirements and worksheets for managing the risks of teaching and supervising diving activities
  - We all know that thoroughly trained divers are less likely to have accidents than those minimally trained, and the best way to protect yourself from legal claims is to prevent accidents
  - Divers who understand the risks and the limits of their training are less likely to blame others for their actions or misfortune.

Risk Management Handbook

- Common Misconceptions
  - Anyone can dive
  - A physician's medical release absolves me, the instructor, of responsibility for considering the divers fitness to dive
  - A properly signed Release of Liability, Waiver and Assumption of Risk will protect me against claims and lawsuits
  - I have no obligation to report incidents which occur while I am teaching or supervising diving so long as no one gets hurt
- Let's look more closely at a few of these

Risk Management Handbook

- Screen students (not everyone can/should dive)
  - Divers should be healthy and fit
  - Instructors must turn away medically unfit or unqualified people
  - We recommend a recent examination by a physician trained in diving medicine
    - However, use of the NAUI medical history information form is an acceptable alternative; provided that if an applicant indicates a medical condition that is a contraindication for diving, a medical exam should be required before accepting them as a student
  - Consult NAUI guidelines for evaluating individuals with disabilities
  - Contact Divers Alert Network (DAN) with any questions / concerns

Risk Management Handbook

- Contraindications
  - Is the reward worth the risk???
  - A person with a condition recognized as an absolute contraindication should not be allowed to dive
  - Many contraindications may reduce a person's fitness for diving, but not prevent them from diving
    - DAN can provide the most recent research
  - Explain the health risks and be prepared to elaborate with references and referrals

Risk Management Handbook

- Applying Fitness to Dive rules
  - Have a regular process for screening students for medical problems prior to the start of a class
  - Don't expect the rules to provide a clear answer in all cases, there are many grey areas
  - Always use your best judgment when deciding if a person is fit to dive
    - When in doubt, turn the person away (you may be saving a life)
  - Remember that special rules apply to minors

Risk Management Handbook

- Supervisory Guidelines
  - When supervising dives, ask yourself – "If something goes wrong at this moment, would my actions be considered reasonable and prudent?"
  - Review the guidelines in the handbook and have an Emergency Action Plan
  - Supervisory guidelines require that students be accompanied by an instructor or certified assistant during entry level training
    - Students should be monitored for potential alcohol or drug use prior to a dive; as well as initial signs of anxiety or distress
    - After a dive, students should be briefed on possible dci symptoms & encouraged to report these early.

Risk Management Handbook

- Diving within Individual Limits
  - Divers should always dive within their individual limits as determined by their training and experience.
  - For example, divers who are part of an organized diving activity should not enter overhead environments (wrecks, caves & caverns, ice, or any environment without direct vertical access to the surface) unless qualified and properly equipped.
  - Continuing Education is strongly encouraged for those who wish to experience advance diving
  - Contingency plans for related, potential emergencies are strongly recommended

Risk Management Handbook

- Preventing Ear Problems
  - Emphasize control of descents during pool training
  - Thoroughly discuss ear clearing problems in the classroom
  - Review ear clearing techniques in pre-dive briefings
  - Have students use descent lines or follow a gentle slope
  - Instruct students with ear problems to immediately terminate all diving activities
  - Report all ear injuries on the NAUI Accident Report Form

Risk Management Handbook

- Release, Waiver, Assumption of Risk, Indemnity
  - Current form is always available on NAUI website
  - Each participant must have his or her own form
  - Make sure it is filled out completely, is legible and is properly signed in the places indicated
  - Terminology is based on most recent court decisions and sound legal advice
  - Available for recreational and technical courses
  - If questions arise about the form,. please submit them to NAUI HQ

Risk Management Handbook

- Release, Waiver, Assumption of Risk, Indemnity
  - 4 sections - each has a unique legal purpose
    - Release of Liability is an agreement by the diver that they will not hold the released parties (dive professional, dive shop or NAUI) responsible for any negligence on their part
    - Waiver of Claims is an affirmative act whereby the diver agrees to not pursue claims against the dive professional, dive shop or NAUI
    - Assumption of Risk is a statement which confirms that "knowing the risk of diving activities," the diver has agreed to assume the risks and will not seek to hold another party responsible"
    - Indemnity is an agreement by the diver that they will hold the released parties harmless from and against all claims or causes of action (this prevents a lawsuit)

Risk Management Handbook

- Accident reports
  - Report every incident which occurs while you are teaching, supervising or just enjoying diving activities
  - An incident may or may not result in an accident
    - Near misses, equipment failures, running out of gas, failure to follow instructions, etc. are all incidents
    - Encourage students to share incidents, this is a learning experience
  - All NAUI members are required to immediately report an incident or accident by using the NAUI Accident Report Form
    - There may or may not be a separate requirement to report incidents or accidents to your professional liability insurance carrier

Risk Management Handbook

- Incident Report form
  - Should be filled out as soon as possible
    - courts give more credibility to reports that are completed close to the time of the event
  - Provide a copy to NAUI (as directed) and to your professional or general liability insurance company
  - If you have specific questions or problems reporting an incident or accident, please contact the Training Department and/or your liability insurance underwriter

Risk Management Handbook

- Useful Risk Management forms
  - All forms are located in the NAUI Risk Management Handbook
    - Rescue and Accident Management Guidelines
    - Information for medical services personnel
    - 5-minute neuro exam
    - Briefing & debriefing outlines, with boat supplement
  - Available on the NAUI website for free download
  - May be reproduced by NAUI members for use in NAUI classes

Summary

- Safety is no accident, but if we are not aware, prepared and informed, the lack of safety could become an accident
- A diving leader can be held responsible for the actions of others with whom responsibility is shared
- Insurance is an indispensable aspect of our business that no NAUI professional should be without – be sure you understand it

Summary

- NAUI and your insurance underwriter have a variety of resources to help you manage and mitigate risk
  - Recognize the value of NAUI's Risk Management Handbook and use it
- Know what to do in case of an accident
  - Have an Emergency Action Plan
  - Timely Report incidents & accidents to NAUI and your insurance company

Are The Ears Stopping You From Diving? What You Should Know.

Tabby Stone, MD

"Dive Safety Through Education"

Are The Ears Stopping You From Diving? What You Should Know.

Tabby Stone, M.D.

Why Talk About Ears?

- Ear problems are the most common medical complaints in divers.
- “My ears hurt when I try to swim underwater,” is a common reason why people decide not to learn to dive.

Diving Related Ear Problems

- Barotrauma
- External Otitis (Swimmer's Ear)
- Decompression Illness

We ain’t marine mammals! Our ears are designed to work best on land. We adapt to going above and below sea level, but not as well as we would like to.

Marine Mammals

With respect to middle ear squeeze, marine mammals have specialized cavernous sinuses in the middle ear that presumably engorge with blood as the animal dives and thus fills the air space

Filling their ears with fluid is beneficial not only for reducing air sacs, but it also allows these mammals to hear better in water then they do on land.

The Ear Exam

"It's a good thing you're here. I just punctured your eardrum."

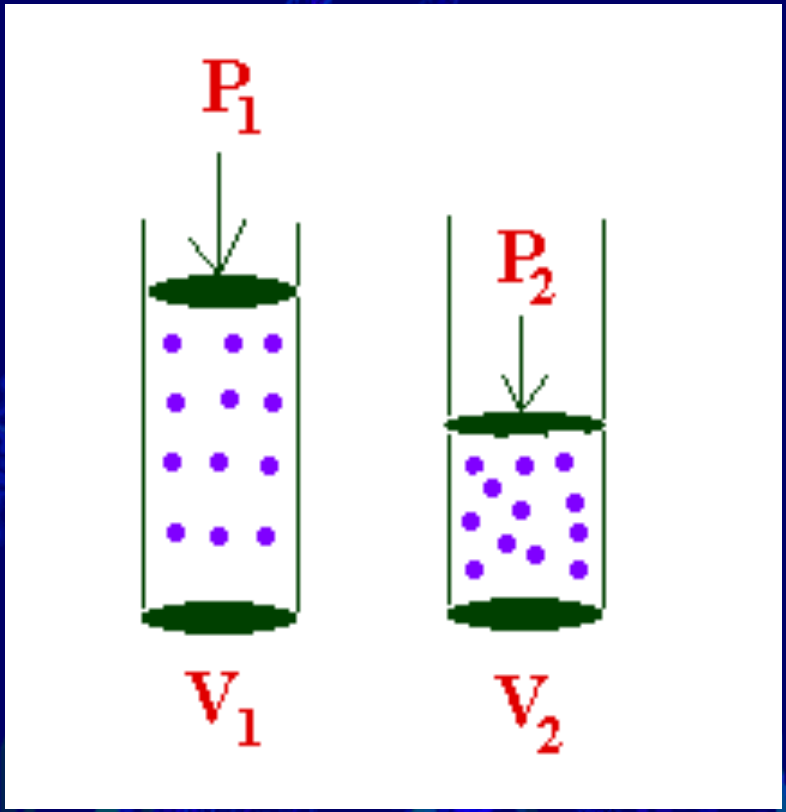
The Ear Exam

Boyle's Law

- At constant temperature the volume of a gas is inversely proportional to the pressure.

Barotrauma

- Going down in the water column increases ambient pressure and decreases the volume of any trapped gas in the body.

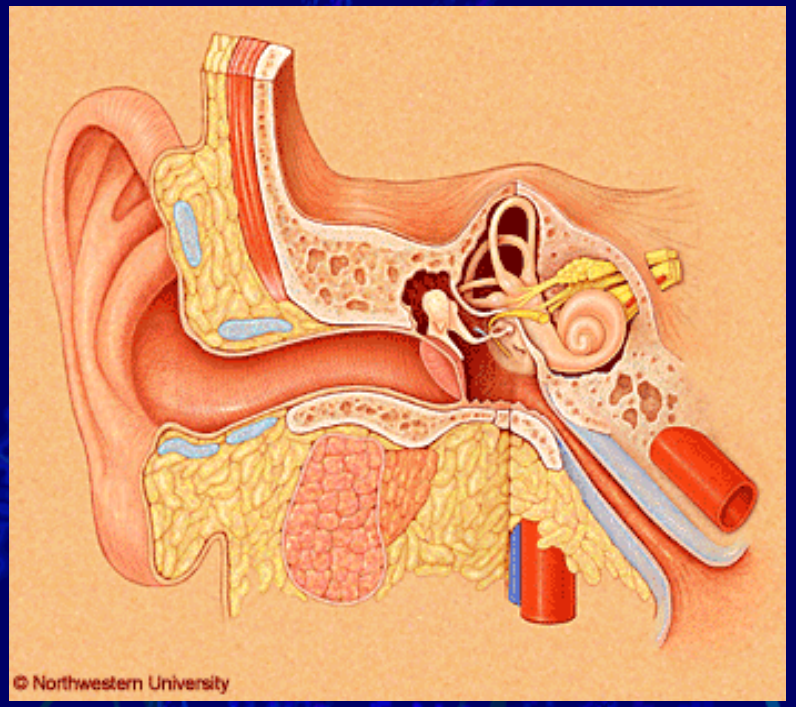


Barotrauma

- Pressure has to get to a gas in order to compress it. Solid tissues (like bone) don't compress. Soft tissues are water filled. They won't compress, but will transmit the ambient pressure.
- If our middle ears were rigid we wouldn't get barotrauma.
- If our middle ears filled with expanded tissue when placed under pressure, (like marine mammals) we wouldn't get barotrauma.

Barotrauma

- The normal ear. Notice the:
  - Outer Ear
  - Middle Ear
  - Inner Ear
  - Eustachian Tube
  - Semicircular Canals

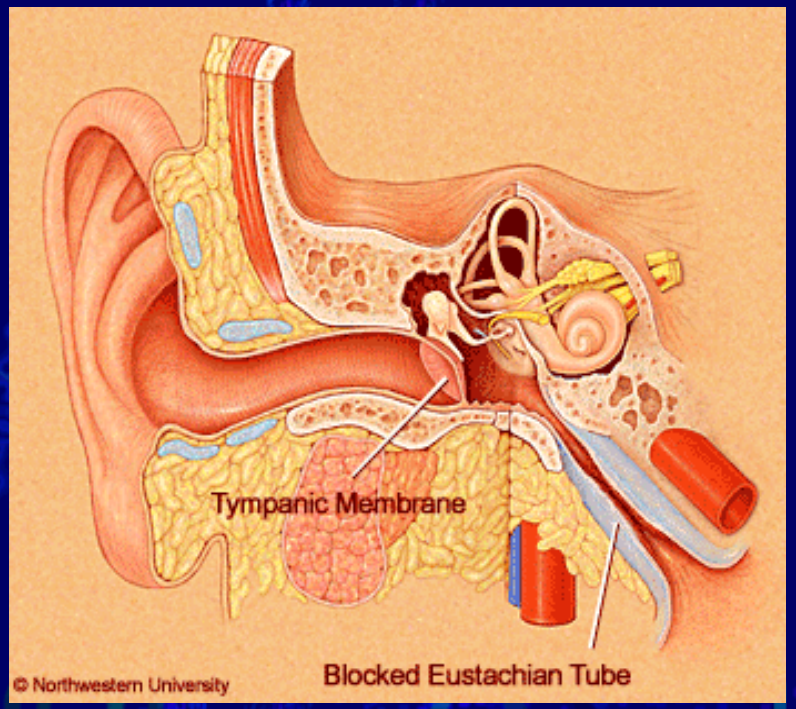


Barotrauma

- Most ear problems related to diving are caused by the anatomy of the Eustachian Tube which was first described by the Italian anatomist, Bartolomeo Eustachio, during the 16th century.

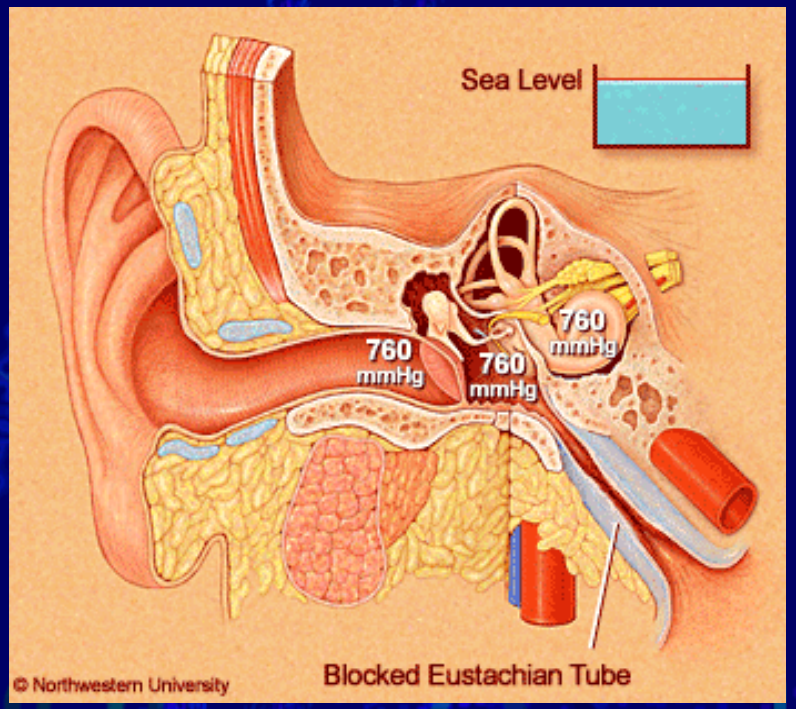
Barotrauma

- The Eustachian Tube travels partly through soft tissue and partly through bone.
- It is normally closed. It opens to allow air to enter or leave the middle ear, to equalize pressure when ambient pressure changes.



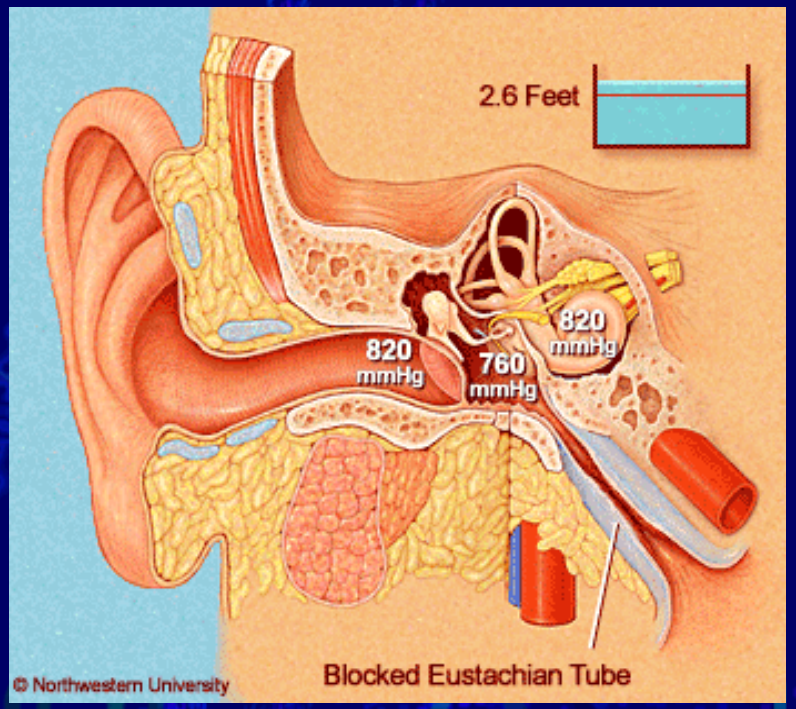
Barotrauma

- At Sea Level, the pressure in all three parts of the ear is equal at 760 mm Hg.



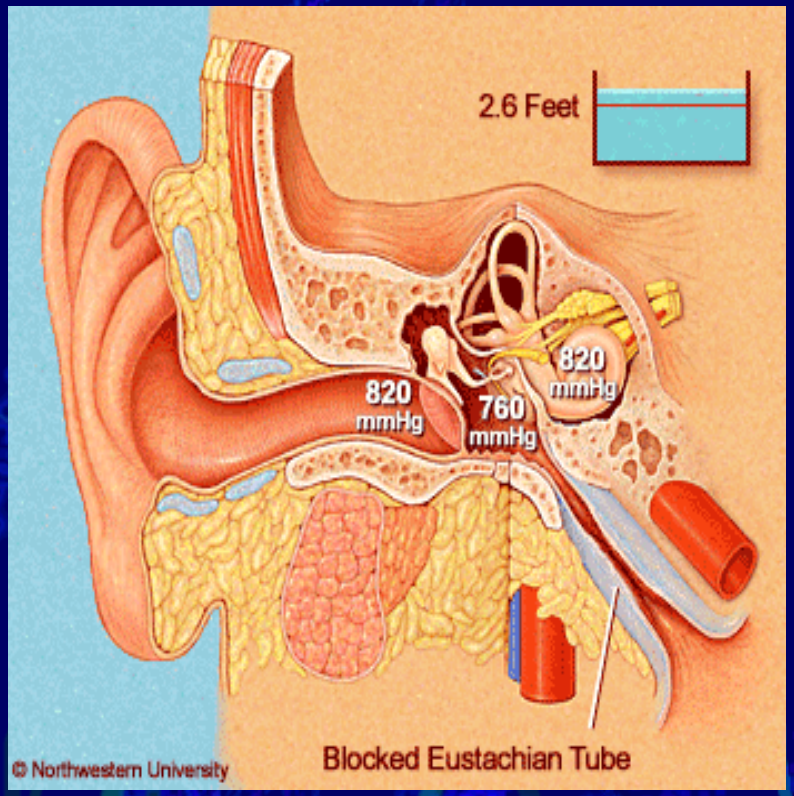
Barotrauma

- As the diver descends to 2.6 feet, the pressure outside the TM rises to 820 mm Hg and the pressure in the inner ear also rises to 820 mm Hg.
- The Middle Ear remains at 760 mm Hg.



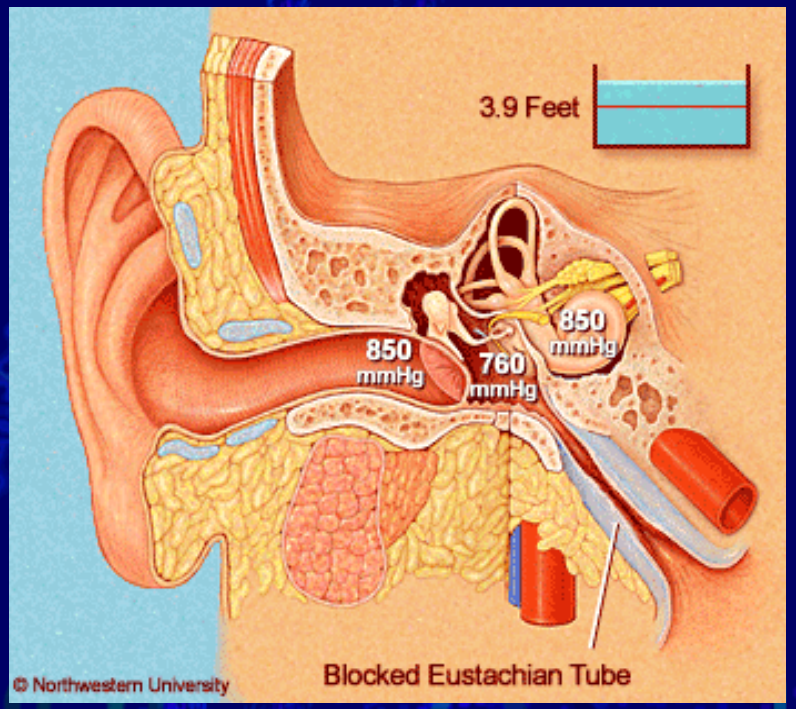
Barotrauma

- The diver will start to feel pressure in the ear. The TM will start to flex inward.
- At this point, with an unblocked Eustachian tube, it should be very easy to equalize pressure.



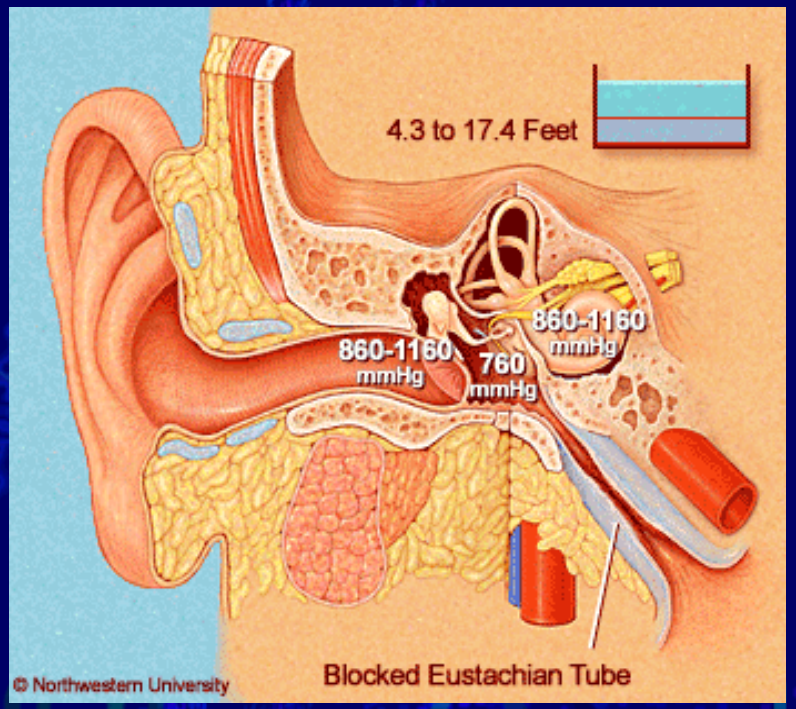
Barotrauma

- As the diver descends to 3.9 feet, the pressure increases in both the ear canal and the inner ear rises to 850 mm Hg.
- In the unblocked ear, equalizing takes a little more effort.



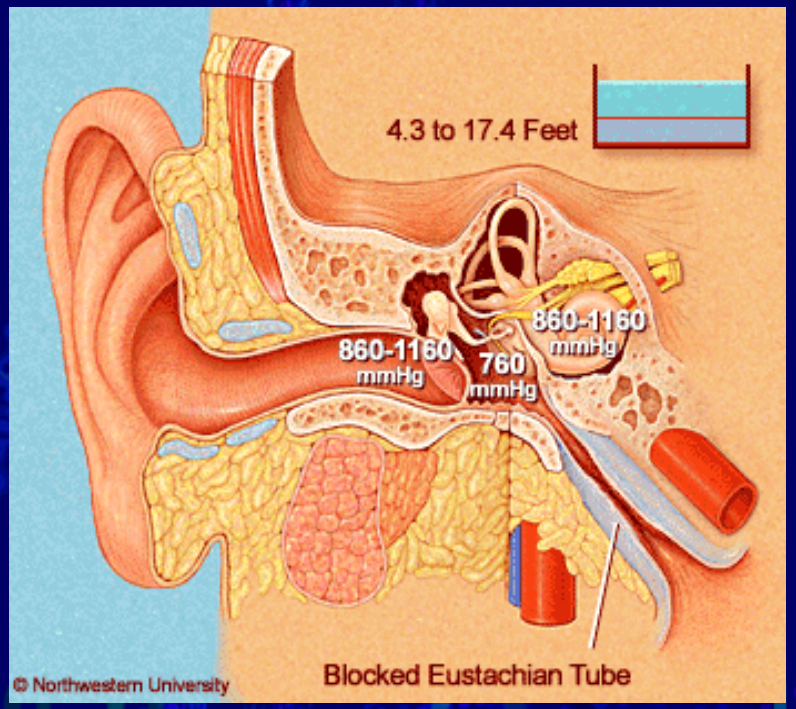
Barotrauma

- With further descent, pressure in the outer and inner ear increases further.
- The middle ear is still blocked and can't increase it's pressure to match ambient pressure.



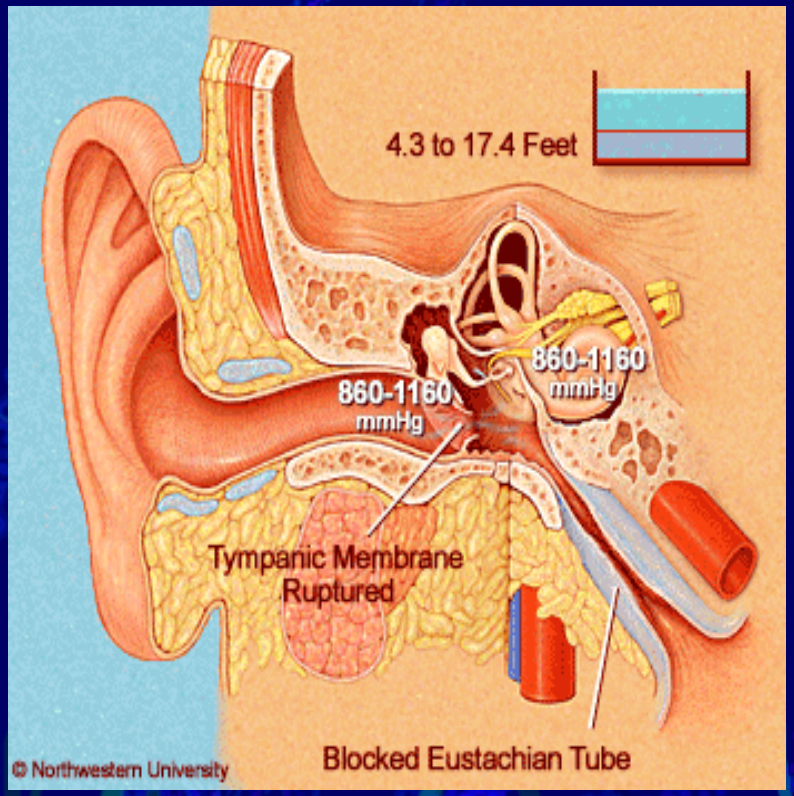
Barotrauma

- The Eustachian Tube becomes “locked and blocked” Even if there were no blockage of the Eustachian Tube, no matter how hard the diver tries, air won’t enter the middle ear.



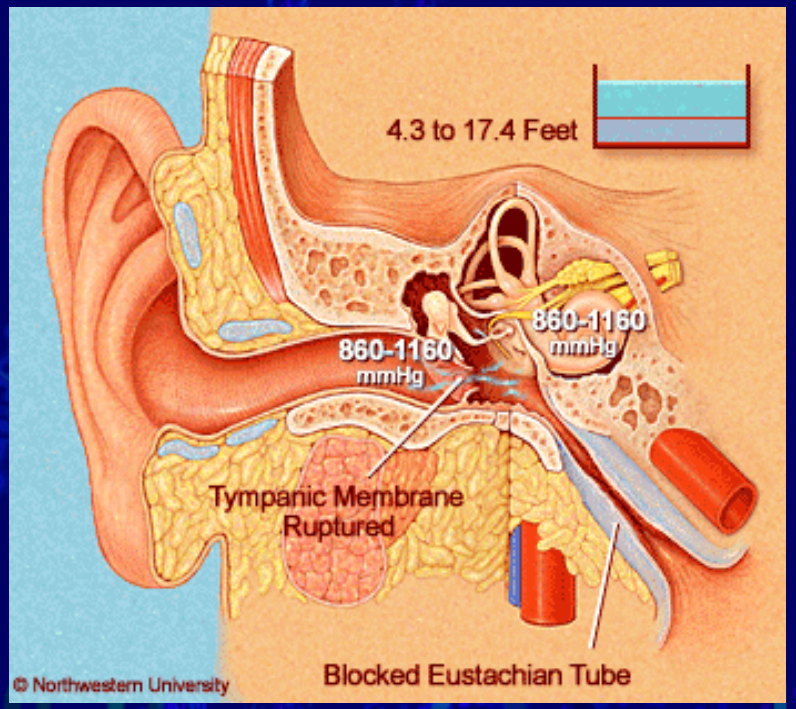
Barotrauma

- The TM will bow further inward. Fluid or blood may leak into the middle ear and with continued descent, the TM may rupture inward.



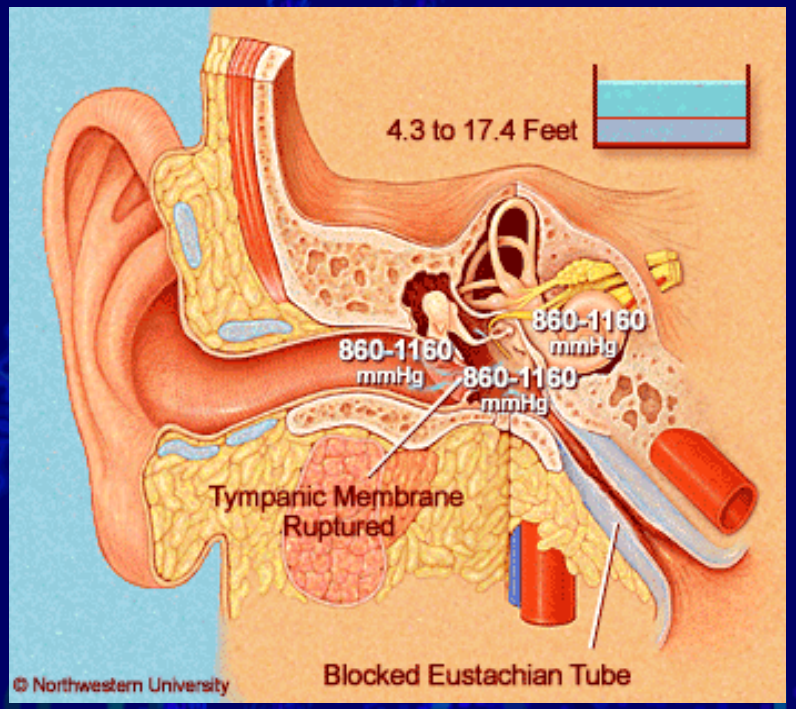
Barotrauma

- Once the TM ruptures, water enters the middle ear and the pressures will equalize.
- Since the water isn't at body temperature, the diver will usually become very dizzy.



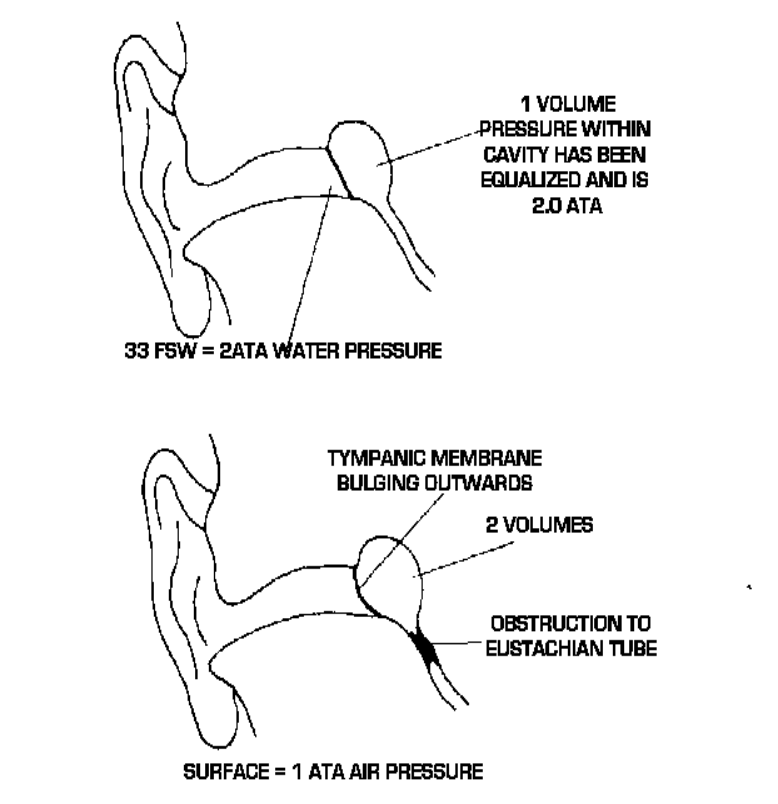
Barotrauma

- There may be some bleeding from the ear or bubbles may be seen coming out of the ear (if the Eustachian Tube is not totally blocked.)



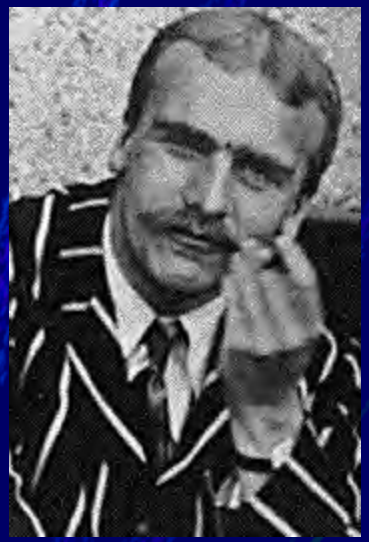
Barotrauma of Ascent

- If the diver develops blockage of the Eustachian Tube at depth, the Middle Ear will be at ambient pressure. The gas in the Middle Ear will expand on ascent.
- Pain will occur as the TM stretches outward.



Perforated Ear Drum

- “the drum generally heals up; and if a hole remains in it, although one is somewhat deaf, one can blow tobacco smoke out of the ear in question which is a social accomplishment.”
  - JBS Haldane



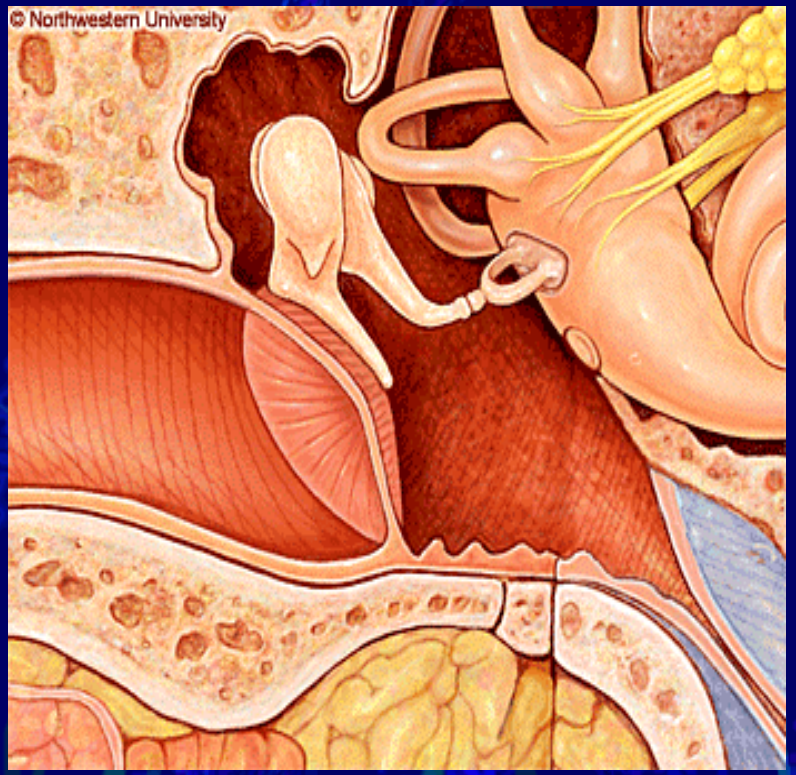
Perforated Ear Drum

Alternobaric Vertigo

- If one ear equalizes on ascent and the other doesn't, the balance mechanisms of the inner ear may be stimulated unequally, causing dizziness.

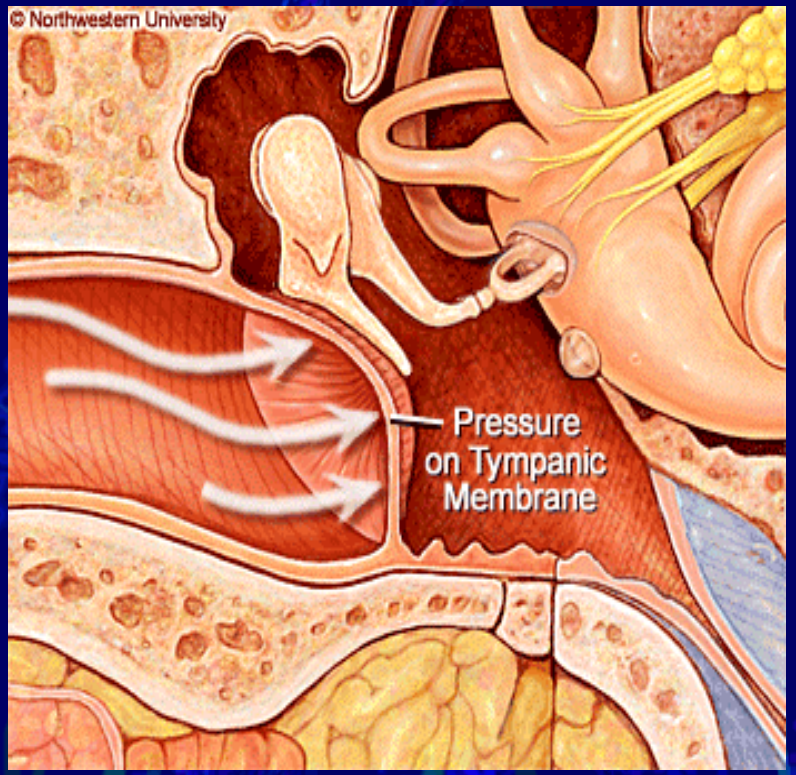
Window Rupture

- The Round Window and Oval Window are the connections from the middle ear to the inner ear.
- The inner is normally at ambient pressure because pressure is transmitted freely through the body.



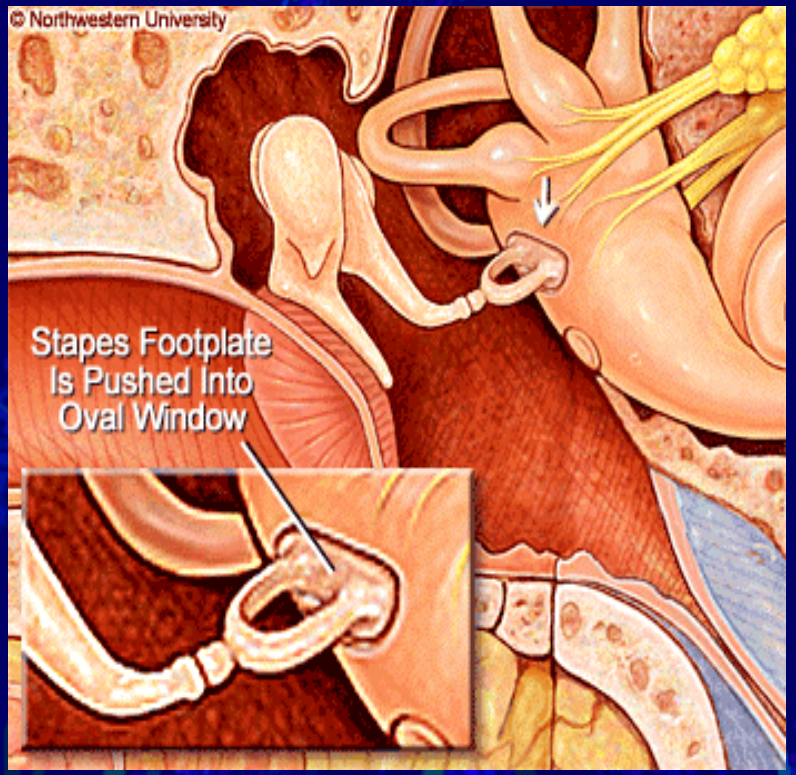
Window Rupture

- On descent, with a blocked Eustachian Tube, as the pressure in the ear canal rises, the TM bulges inward



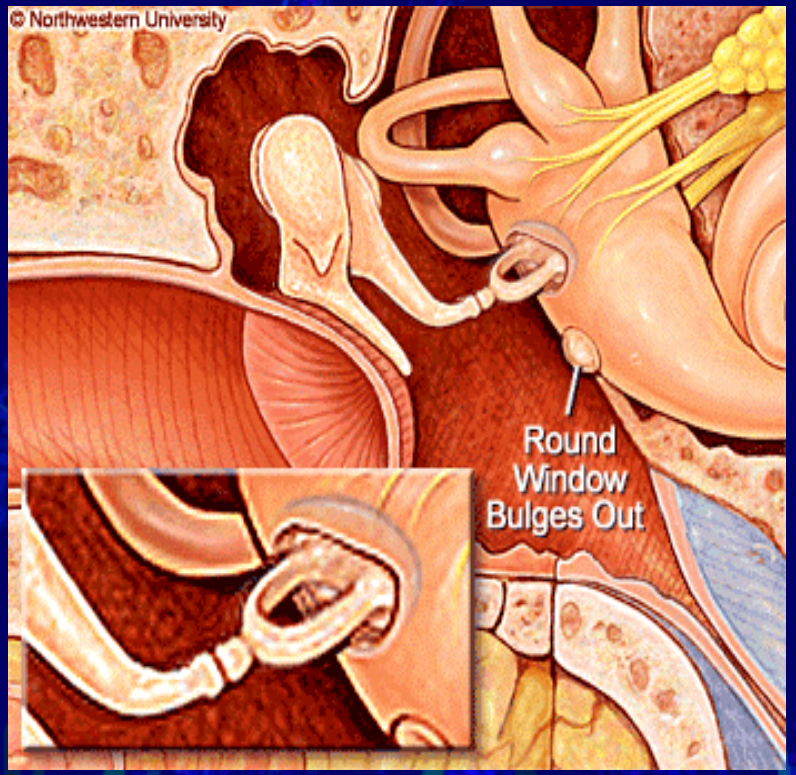
Window Rupture

- The ossicles retract and the footplate of the stapes is pushed into the Oval Window.



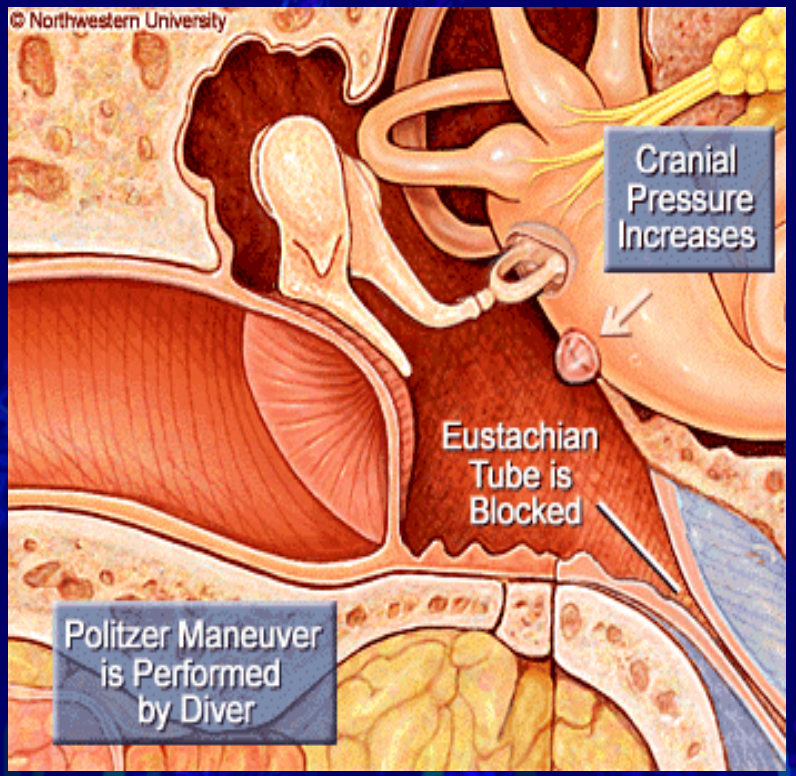
Window Rupture

- The pressure from the Stapes is transmitted through the semicircular canals and the Round Window bulges out.



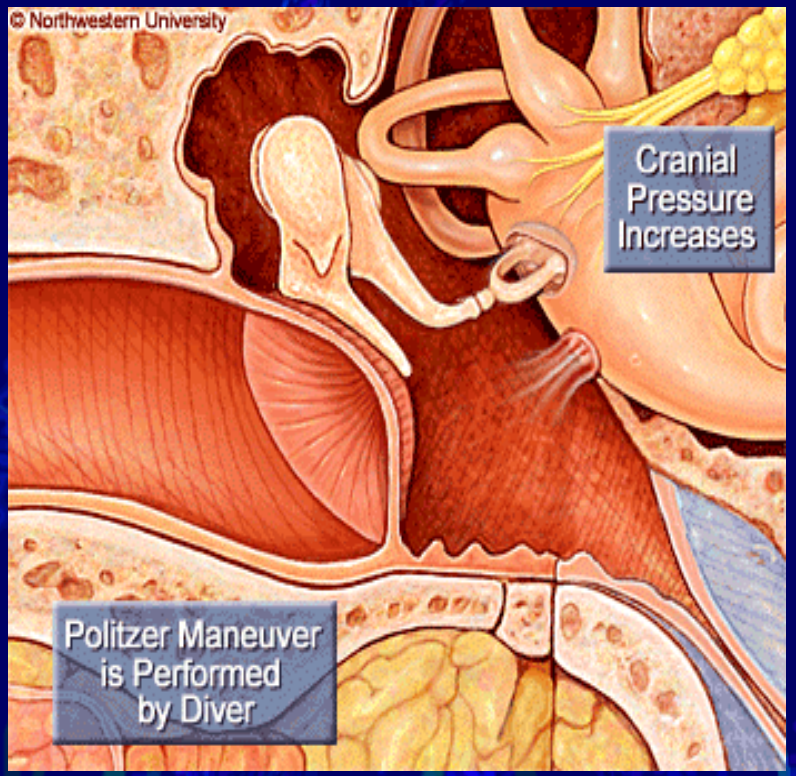
Window Rupture

- When the diver forcefully equalizes, pressure is transmitted to the lungs. This puts pressure on the venous system which is transmitted to the head as increased Cranial Pressure which increases inner ear pressure.



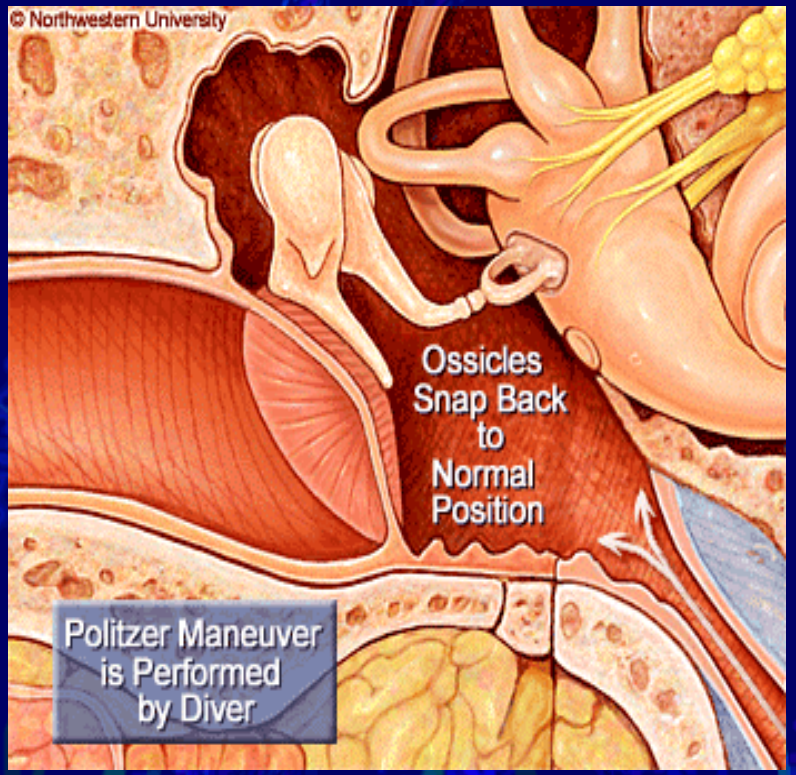
Window Rupture

- If the pressure differentials are high enough, the Round Window can explode outward into the Middle Ear.
- The diver will become dizzy and lose hearing.



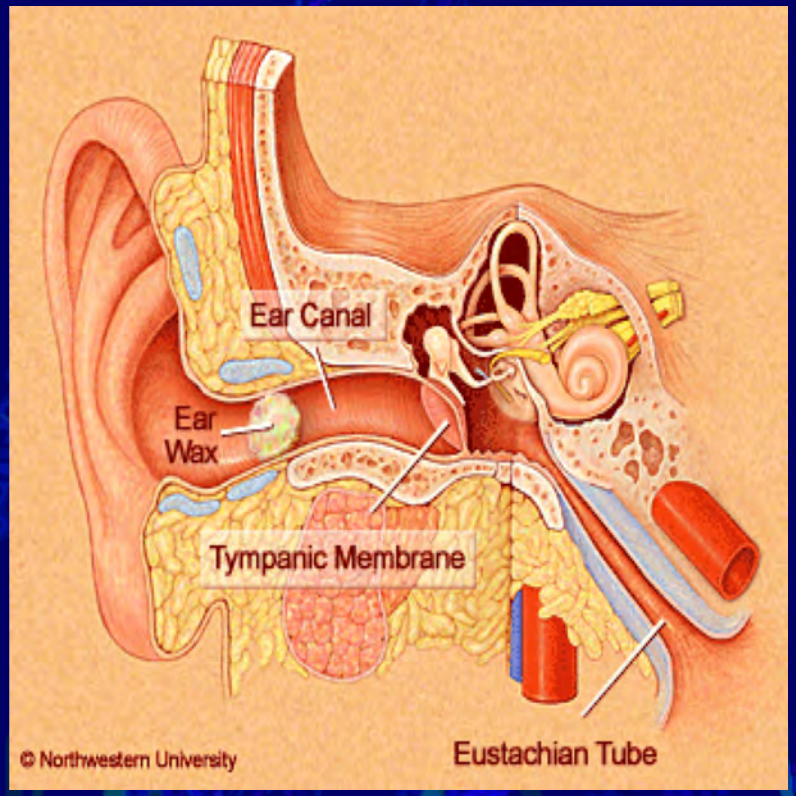
Window Rupture

- It's also possible for the window to rupture inward if the Eustachian Tube suddenly opens with a forceful equalization. The ossicles can snap back and pull the Round Window inward.



External Ear Barotrauma

- If the ear canal is blocked by ear wax, a non-vented ear plug, or a tight hood, a closed space is created in the outer ear.
- With pressure change, the TM will bulge outward causing pain, and bleeding in the TM.



Ear Plugs

- They can keep water out of your ear
- They trap air in the external ear canal creating a new place that can be squeezed. This forces the ear drum out and the plug further in as you descend.

Ear Plugs - The Exception

- A vented ear plug may allow you to equalize with an ear plug in place.
- This is used primarily to prevent exostoses of the ear canal (“Surfer’s Ear”)

Equalization Techniques

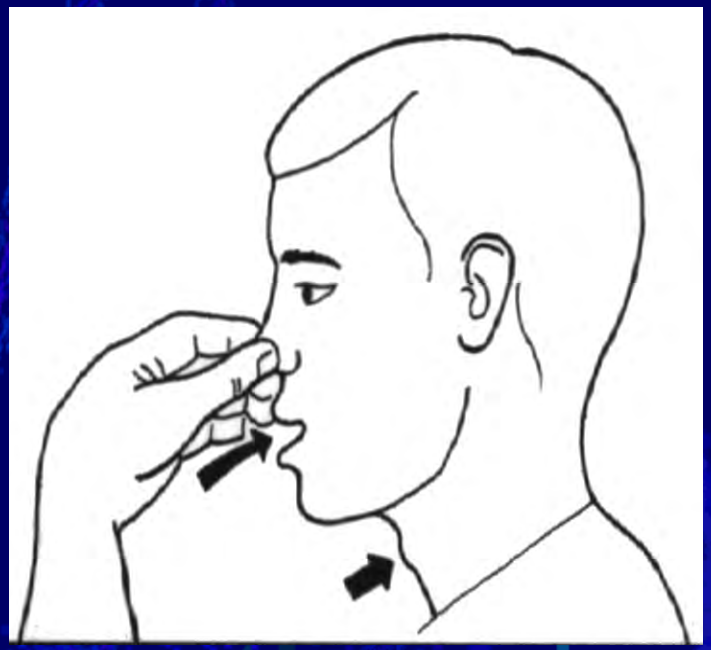
- Valsalva
- Frenzel
- Toynbee
- Beance Tubaire Volontaire (BTV)
- Roydhouse Maneuver
- Edmonds Technique
- Lowry Technique
- The Twitch

Barotrauma

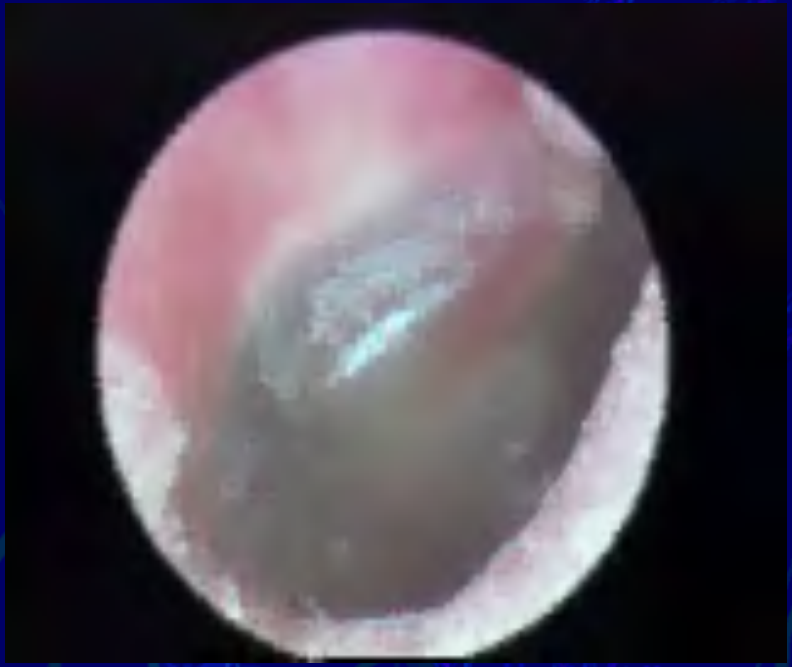
- So, how do you prevent it?

Equalization Techniques

- Valsalva Maneuver Pinch the nostrils and increase pressure in the chest. Attempt to blow out the closed nostrils with the cheek muscles kept tight.
- It's easy, but it can decrease venous return to the heart and lower blood pressure if it is prolonged.

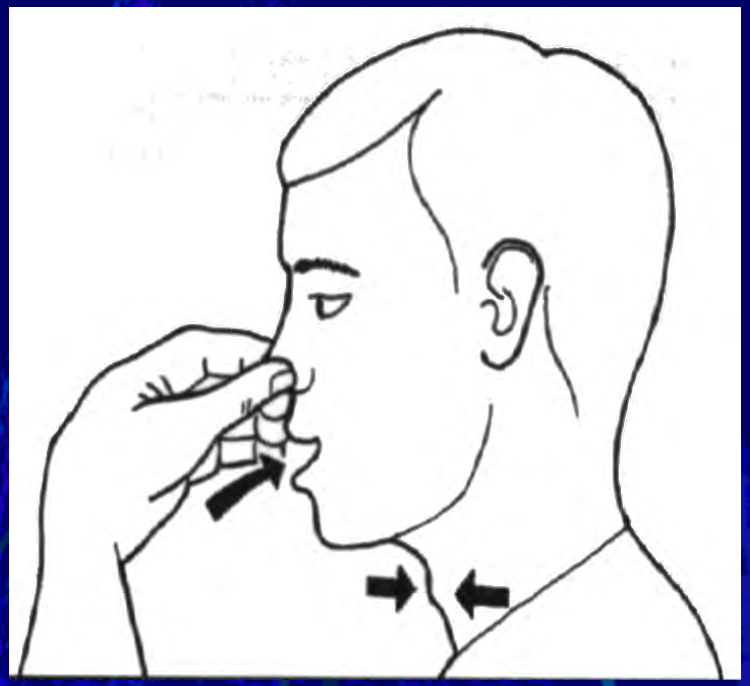


Valsalva Maneuver



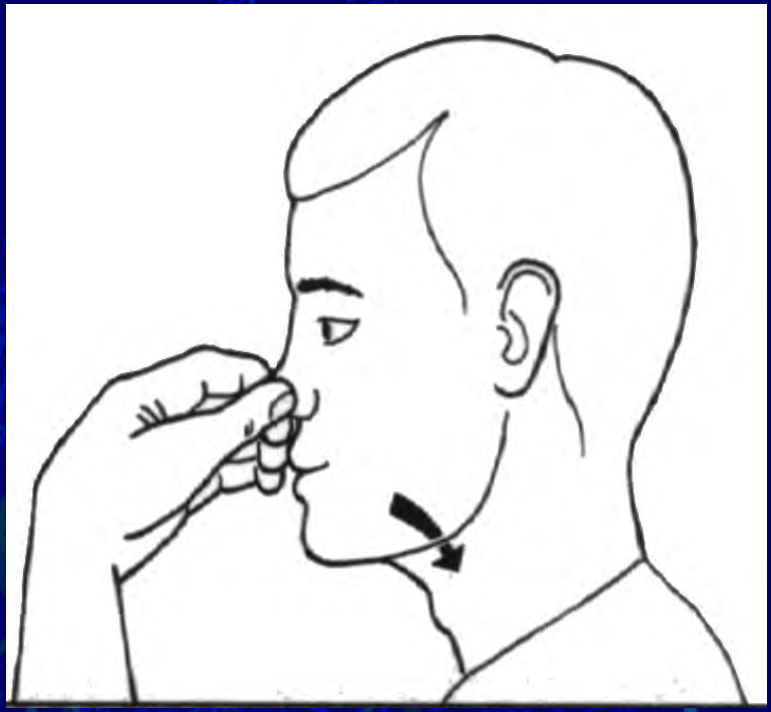
Equalization Techniques

- Frenzel Maneuver
  From technique taught to Luftwaffe pilots in WWII. Close the vocal cords like you are going to lift heavy weight. Pinch the nostrils and make a “K” or “guh” sound. This raises tongue creating a piston effect.
- It does not inhibit venous return.
- Practice by watching the nose inflate slightly and the Adam’s Apple bob up and down.



Equalization Techniques

- Toynebee Maneuver Pinch the nostrils and swallow.
- Works more easily on ascent.
- Sometimes difficult for novice divers.



Equalization Techniques

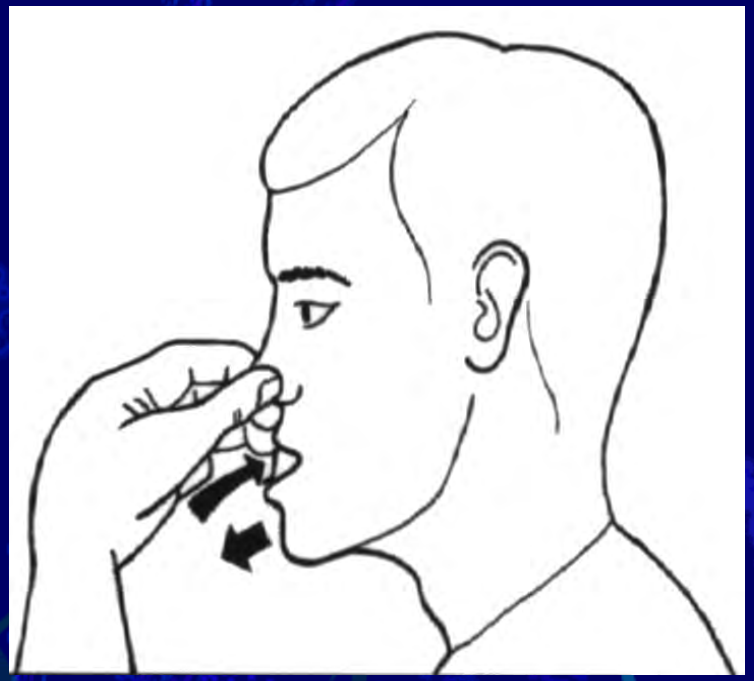
- Beance Tubaire Volontaire (BTV)
  French Navy technique for “Voluntary Tube Opening”
  Contract the muscles of the soft palate while the upper throat muscles pull the Eustachian Tube open. Similar to the end of a yawn.
- Difficult to do for many divers.

Equalization Techniques

- Roydhouse Maneuver
  Similar to the BTV. Learn to tense the tensor and lifter muscles of the palate. (Watch the uvula move up in a mirror to practice.) After learning this, tense the tongue muscles to create a crackling sensation of Eustachian opening. A jaw thrust may make it more effective. Sort of like the technique of blowing smoke rings.

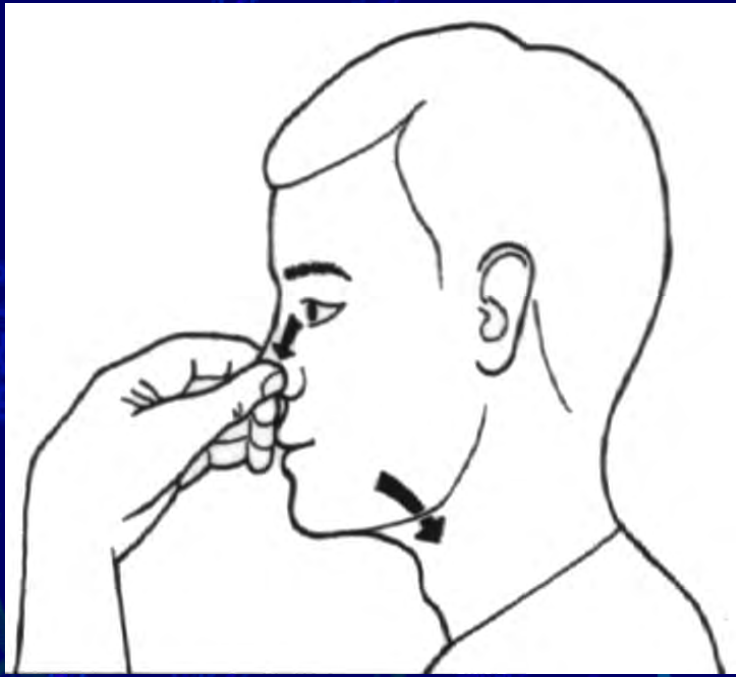
Equalization Techniques

- Edmonds Technique Valsalva or Frenzel combined with jaw thrust or head tilt.



Equalization Techniques

- Lowry Technique
  Pinch the nostrils, build up pressure and swallow at the same time.



Equalization Techniques

- The Twitch
  Pinch the nostrils with a moderate pressure in the back of the throat using Valsalva or Frenzel. Then suddenly “twitch” the head sideways.

Equalization Techniques

- Try the techniques until you find one that works for you.
- While you can’t see your ear drum move without special equipment, you can feel the “pop” as you practice.
- With active techniques, you can look in a mirror and see the upper part of your nose expand as you gently blow against resistance.

Equalization Techniques

- Equalize on the surface first. If you can’t clear your ears there, you won’t be able to once you get below the surface.
- Clear frequently, especially in the first 33 feet. Stay “ahead of the pressure.”
- Descend feet first.
- Look up.

Equalization Techniques

- If just one ear doesn’t clear, tilt your head so that ear is higher.
- Stop if it hurts. Ascend a few feet and try again. Don’t try to force air in.
- If you have to keep ascending and descending, you should probably abort the dive rather than risk ear damage.

Equalization Techniques

- Some people feel that milk, tobacco and alcohol increase mucous production.

Equalization Techniques Medications

- Medications:
  If you have allergies, treating them well in advance with nasal steroids cuts down on congestion.
- Nasacort AQ (triamcinilone) and Flonase (fluticasone) are now available over the counter

Equalization Techniques Medications

- Decongestants can be used in moderation, if you have **MINIMAL** congestion knowing that you will still have an increased risk of barotrauma.

Equalization Techniques Medications

- Pseudoephedrine (Sudafed, etc.)
  Use long acting forms
- Oxymetazoline (Afrin, Duration, etc.)
  Lasts around 12 hours.
  Can have “rebound” after use for more than a few days.

Equalization Techniques Medications

Using Nasal Spray

Use it as drops, not a spray.

Tilt your head back and toward the shoulder to get it toward the Eustachean Tube opening.

Equalization Techniques

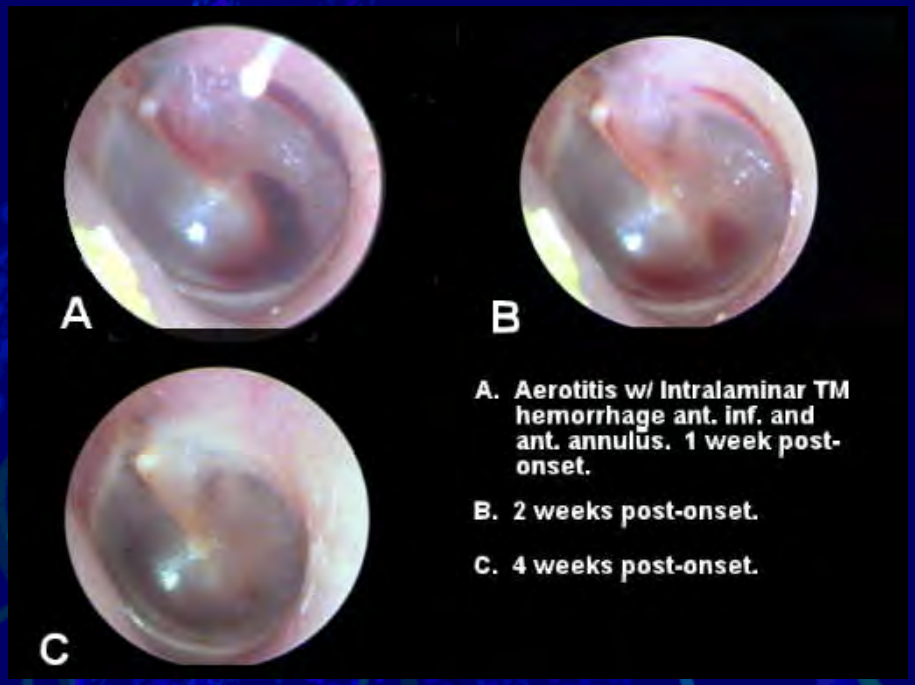
- There is an alternative mask with external cups that go over the ears and connect to the mask.
- Pressurizing the mask, also pressurizes the cups and equalizes pressure on both sides of the ear drum.

Barotrauma Treatment - Pain

- If it hurts, you can take medication for the pain.
- If the medication makes you feel better, that doesn't mean your ear is better.
- Decongestants may help

Barotrauma Treatment - Pain

- If it hurts - DON'T DIVE
- If you develop pain after a dive, you've probably done some damage to your ears and going back in the water is only going to make things worse.



Barotrauma Treatment - Pain

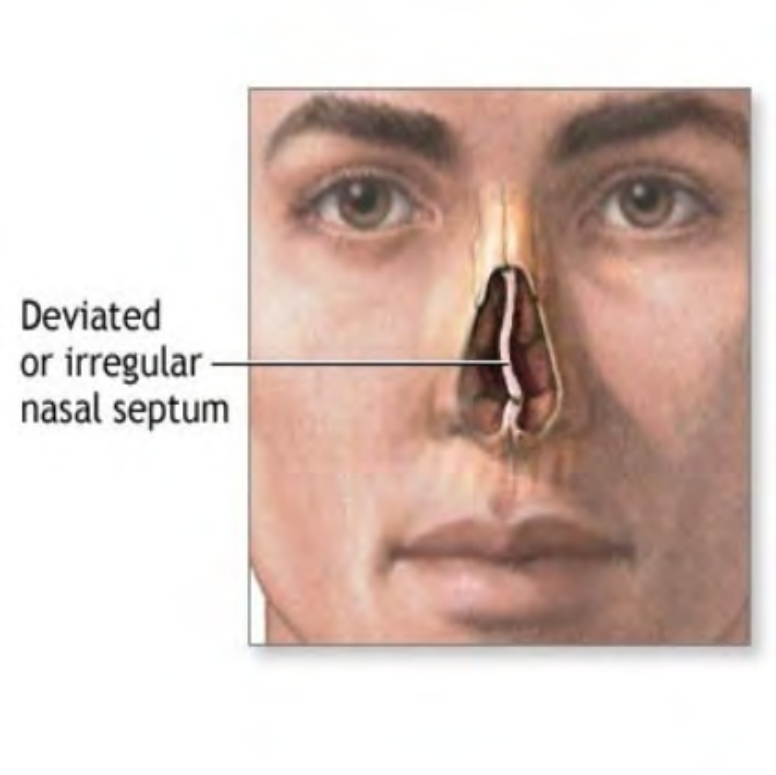
- You shouldn’t dive again until the pain is gone and you can easily clear your ears on the surface.
- This may take days to a couple of weeks depending on how much damage you’ve done.

Barotrauma Treatment

- When you've spent a lot of money to get to a remote island in the middle of nowhere, you're likely to dive anyway sooner than you probably should.
- Recognize that you are taking a risk!

Deviated Septum

- A deviated nasal septum can prevent equalization.
- Sometimes surgical repair is needed.



Snapshots at jasonlove.com

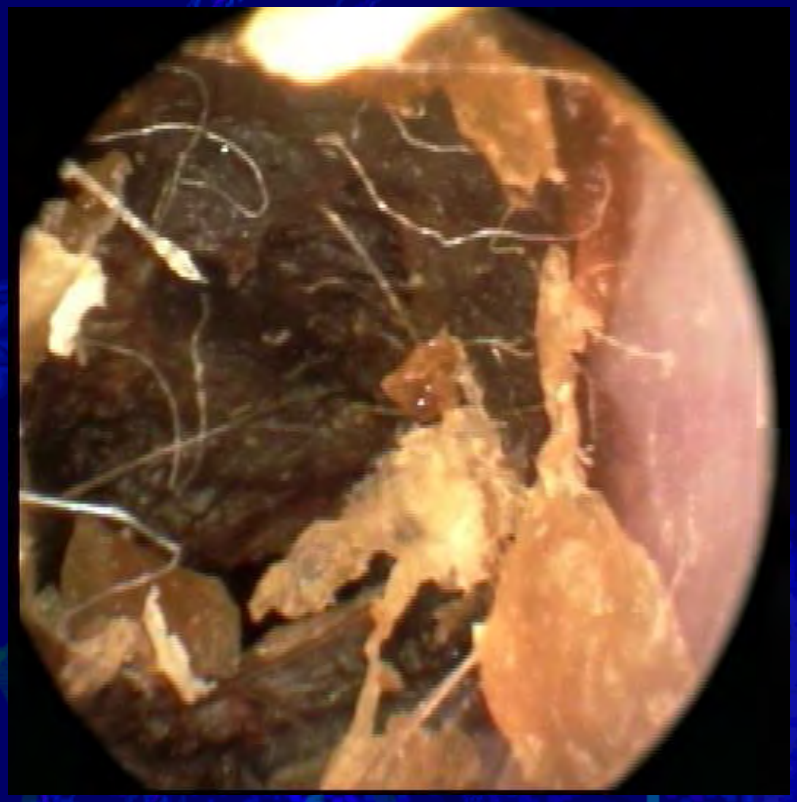
Dr. Johnson continued to check people's ears the way he was supposed to, but it had been years since he remembered what he was looking for.

Ear Wax

- Most ear wax is of no significance to divers and will be probably be washed out while in the water.

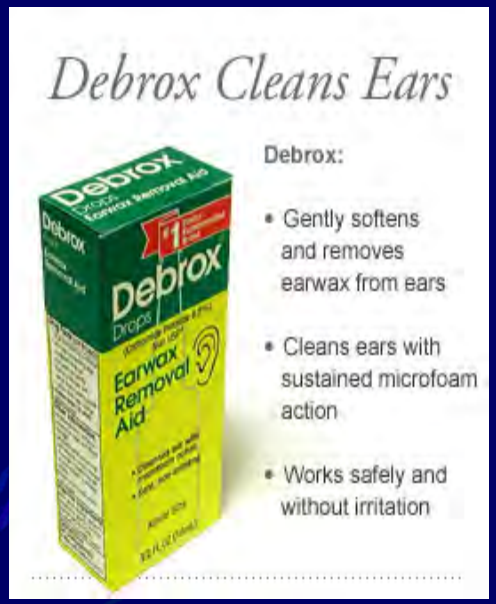
Ear Wax

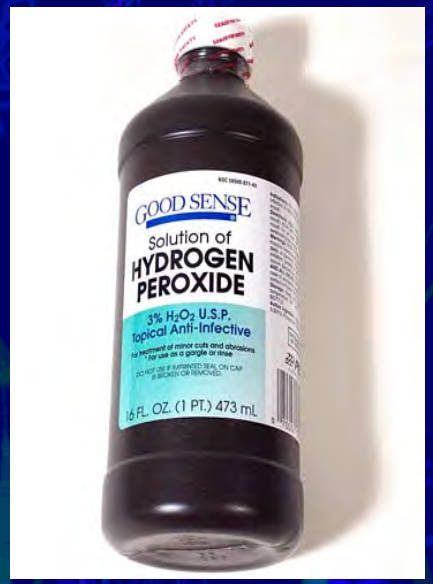
- Large amounts of ear wax can fill the ear canal and act like a plug.



Ear Wax

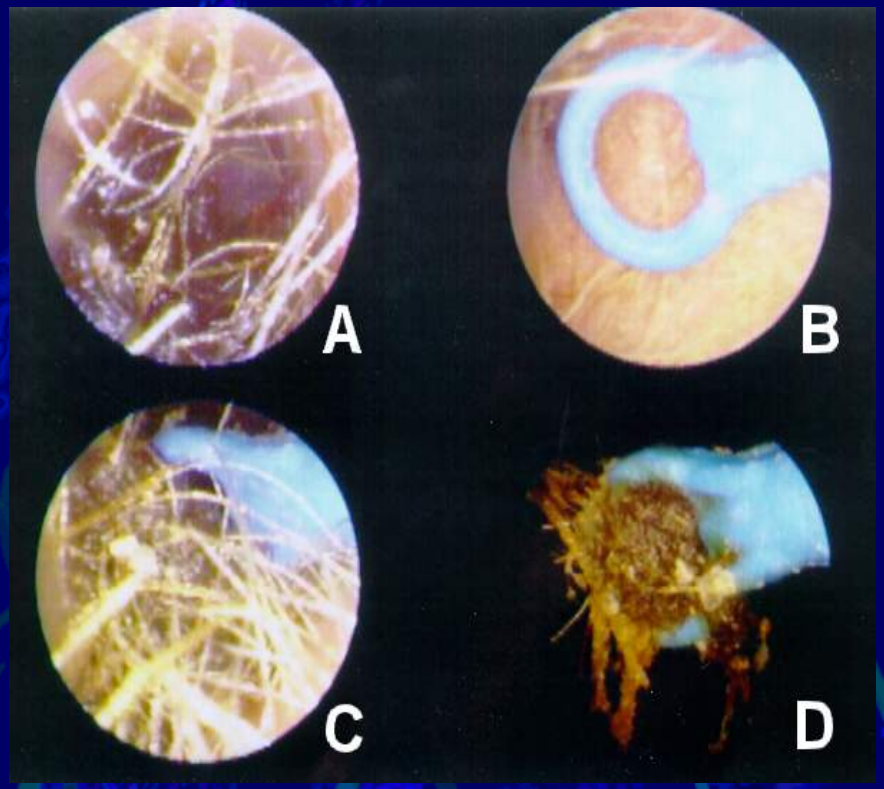
- Thick wax which obstructs the ear canal, can usually be removed by flushing the ear with body temperature water.
- Debrox or hydrogen peroxide mixed with water can loosen the wax.





Ear Wax

- Or, the wax can be scraped out by trained personnel.



Ear Wax

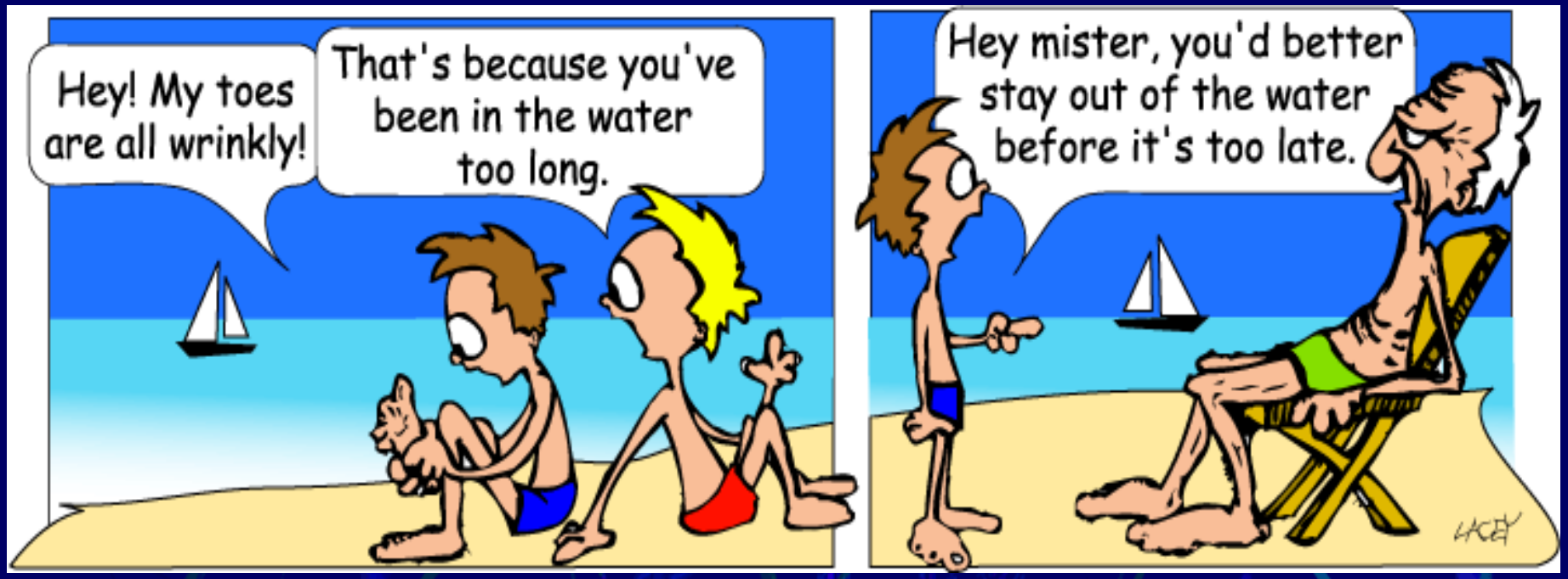
Ear Wax

Exostoses (Surfer's Ear)

- Over time, repeated exposure to cold water causes bony growth in the ear canal.
- The bone can grow enough to partly block the canal.
- The only cure is chopping out the excess bone.

Otitis Externa (Swimmer's Ear)

- Otitis Externa is a skin infection of the ear canal.
- While in the water, there's no problem since water washes in and out.


Hey! My toes are all wrinkly!
That's because you've been in the water too long.
Hey mister, you'd better stay out of the water before it's too late.
LACEY

Otitis Externa (Swimmer's Ear)

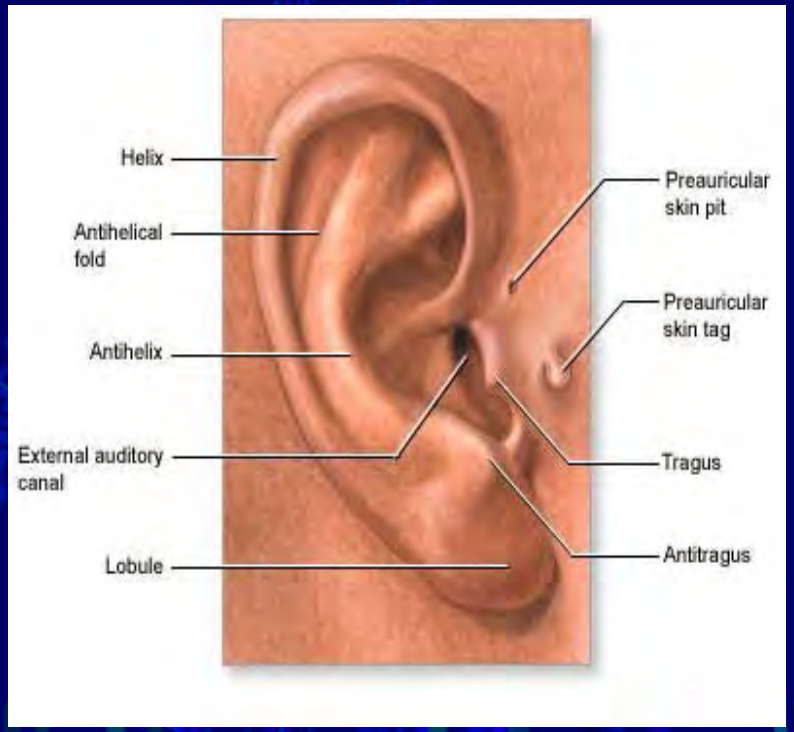
- On leaving the water, if the wax barrier is broken, the skin is more easily penetrated by organisms.

Otitis Externa (Swimmer's Ear)

- The damp outer ear is a warm dark, moist place, providing perfect conditions for infection to develop.

Otitis Externa (Swimmer's Ear)

- Symptoms start with some itching, then pain.
- The outer ear will be tender, especially if you pull on it or touch the tragus or pull on the ear.



Otitis Externa (Swimmer's Ear) PREVENTION

- **DO NOT USE Q-TIPS!**
- **NOTHING SMALLER THAN YOUR ELBOW GOES IN YOUR EAR!**

Cotton Swab

Otitis Externa (Swimmer's Ear) PREVENTION

Dry the ear after diving.

- Use the end of a towel to wick water out.
- Use the low setting on a hair dryer to evaporate the water.

Otitis Externa (Swimmer's Ear) PREVENTION

- Removal of the top of the skull is not necessary when drying the ear.

Otitis Externa (Swimmer's Ear) PREVENTION

- What's marketed to divers?

  The Dry Ear Sahara is a battery operated dryer designed to blow warm air directly into the ear.

Otitis Externa (Swimmer's Ear)

PREVENTION AND TREATMENT

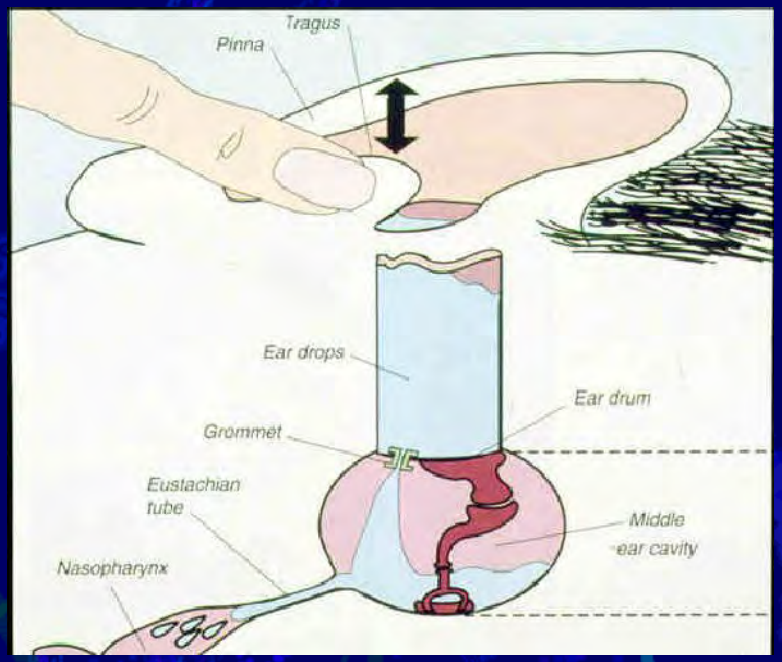
- Use ear drops to dry the ears and make pH of the ear canal slightly acidic.
- Mix equal parts of white vinegar and rubbing alcohol.
- Commercially prepared drops also work fine, but cost a lot more.

Otitis Externa (Swimmer's Ear) PREVENTION

- Fill the ear canal with the drops and leave your head tilted to one side for a couple of minutes.

Otitis Externa (Swimmer's Ear) PREVENTION

- Wiggling the Tragus may make it easier to get the drops in.
- The drops will come out when you straighten your head. That's OK.
- Use the drops after each dive and at the end of each day of diving.



Otitis Externa (Swimmer's Ear) TREATMENT

- The same drops which are used to prevent Otitis Externa can be used 4 times a day as a treatment for mild cases.
- In more severe cases, a physician may prescribe medicated drops.

Otitis Externa (Swimmer's Ear) TREATMENT

- Continue the drops until there is no itching or pain for a couple of days. (often 5-7 days.)
- Keep water out of the ear.
- Pain medications may be needed.
- Oral antibiotics are rarely needed.

Inner Ear Decompression Illness

- You can get DCS (Bends) in the ear.
- This is not a common decompression problem in recreational divers.

Inner Ear DCS - Treatment

- Recompression in a chamber.

What if you get an ear problem?

- Pain
- Hearing Loss
- Dizziness

Why Does My Ear Hurt?

Barotrauma

- Trouble Equalizing
- Pain usually starts in the water
- Feeling of fullness
- Sometimes hearing loss
- Sometimes dizziness

Otitis Externa

- No trouble equalizing
- Usually starts slowly, often with itching first
- Painful when you pull on the outer ear.

Why Can't I Hear?

Barotrauma

- Trouble Equalizing
- Pain
- Fullness
- Dizziness
- Ringing in the ears
- Starts during the dive

Inner Ear DCS

- Deep Diving
- Mixed Gas Diving
- Other DCS symptoms
- Dizziness
- Usually starts after the dive

I’m Dizzy

- If it was very brief, just in the water and there are no other symptoms, you’re probably OK. You probably just had Alternobaric Vertigo
- If you stay dizzy, especially if you can’t hear well, lie down to stay more comfortable and see an ENT physician as soon as possible. Don’t dive again until the problem has been diagnosed.

Misc.

- Earrings that are bright and dangle may get caught on wetsuit hoods.
- In warm water, when no hoods are used, they may attract fish which may mistake them for something edible.

"It's one of my wife's earrings,I just put hooks on it"

Who Shouldn't Dive Because Of Ear Problems?

- Can't equalize
- History of significant ear surgery (fixing ossicles, patched TM, Radical Mastoidectomy) <maybe>
- History of window rupture <maybe>
- Meniere's Disease or other chronic dizziness

Who Shouldn't Dive Because Of Ear Problems?

- Perforated TM <maybe>
- Facial nerve paralysis after barotrauma
- Cholesteotoma
- Tracheostomy
- Incompentent larynx (can't close to valsalva)

What Are The Problems?

Table 3
Reported diagnoses for ear problems related to diving by number of cases, percentage of total presentations and incidence per 1,000 dives
(MEBT – middle ear barotrauma)

All ear conditions	Cases	%	Incidence
Total	**186**	**34.4**	**8.47**
Otitis externa	67	12.4	3.05
Ear – unspecified	46	8.5	2.10
MEBT	31	5.7	1.41
Otitis unspecified	14	2.6	0.64
Diver's ear	9	1.6	0.41
Otitis externa (bilateral)	8	1.5	0.36
Ear – impacted wax	4	0.7	0.18
Otitis media	2	0.4	0.09
Otitis mixed	1	0.2	0.05
Ear – water retention	1	0.2	0.05
MEBT with perforation	1	0.2	0.05
Outer ear barotrauma	1	0.2	0.05
Reverse ear barotrauma	1	0.2	0.05

What Are The Treatments?

Table 4
Treatments most commonly prescribed (1% or more of those documented) during Coral Cay Expeditions

Treatment	Percentage
Ear drops	15.5
Oral antibiotics	11.7
Rest from diving	8.9
Oral decongestants	8.6
Wound-dressing kit	7.8
Wound cleaning	5.7
NSAIDS	5.7
Topical creams	5.2
Rest	5.1
Oral fluids	3.9
Oral antihistamines	3.8
Minor procedure instruments	3.8
Oral analgesia	3.4
Common sense advice	3.0
Betadine	2.6
Minor procedure	2.3
Wound dressing	1.7
Minor injuries treatment	1.5
Eye drops	1.3
Hygiene advice	1.2
Antacid	1.0

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THE EAR FAIRY ACHIEVED SUCCESS AT LAST . . .

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