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### The Presidents’ Corner

**by Mike Cassetta**

Seals..... lots of seals! A group of FCDA members travelled to Cape Anne in early July. Mark Shannon, Matt, Mel, Sal “the Cookie Man”, Rick and I enjoyed a beautiful weekend of camping. The diving was excellent as well as a group of us enjoyed beautiful dives on Friday and Saturday. In addition to great visibility and calm seas, we were greeted by a number of furry sea creatures. Sal, Matt, Mel and I were lucky enough to have close visits by multiple seals and with 3 cameras on scene we also got some nice footage.

The June meeting featured our own Matt Rownin showing as recent trip to Devil’s Den in Northern Florida. Paul “The Big Boss” Gacek will be our guest presenter for July with Diving Cozumel and August will be our annual movie night.

We are still in need of a club secretary. It’s a great opportunity and we are offering double the President’s salary. (FCDA Pres that is). 2x$0=Incentive. Please, we really do need someone to help.

We are the height of dive season. If you can’t travel there are many great opportunities locally. The Sound is clear as ever and the temps are now in mid 70s, who needs Bonaire. The summer diving in the northeast is surprisingly good, so get out out and get wet.

See you all soon

... ............Mike
FCDA Donor

The business listed on this page has donated dive gear and dive services to help support the Fairfield County Diving Association.

http://nedive.com

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Quick, Pass Me Your Octopus!
June Meeting DAN Raffle Winners

After a fascinating presentation by Matt Rownin on Cavern Diving: Devil’s Den, the club hels its monthly raffle to support our DAN Platinum sponsorship.


Thanks to **New England Dive Center** and **Orbit Marine Dive Center** for donating tonight’s raffle prizes for our DAN raffle. Remember, you can’t win if you don’t buy tickets and you can’t buy tickets if you don’t get up and come out to **FCDA** events and meetings!

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FCDA Member Ads

Hey - have you got a non retail-diving business that you’d like to share with fellow members of FCDA? Get your business card size ad in the FCDA monthly newsletter "**Surface Interval**" for only $50.00 for one year. Give your business a boost and help support the production of our monthly newsletters. For more information, write to FCDA, P.O. Box 3005, Fairfield, CT 06824 or email to fcda@aol.com.

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11 Quick Tips For Avoiding Motion Sickness
by Jim Bartlett

Even the smallest things can disrupt comfort while traveling and diving. Perhaps nothing ruins a dive trip more quickly than an urgent need to “feed the fish” from the railing. Thus, most divers try very diligently to avoid getting motion sickness – but how? What really works?

First, we need to understand what causes motion sickness. Often termed “sea sickness,” this malady really has little to do specifically with the ocean and everything to do with motion, so “motion sickness” is a more universally accurate term. When such motion causes the tiny sensors in our body to register something’s amiss, we start to feel a bit queasy, and if not remediated quickly, nauseous.

So how can we avoid motion sickness? Here’s an 11-part strategy:

Need to feed. A meal before you board is highly important. For most people, an empty stomach is more sensitive to being irritated, so filling it with comfort food 45-60 minutes before leaving shore is smart. Load up on carbohydrates at breakfast and avoid acidic and greasy foods, as they may contribute to motion sickness. Lastly, avoid alcohol and cigarettes.

Medicate. If you know you’re especially prone to motion sickness, investigate the use of over-the-counter antiemetic medications such as mectlozine (Bonine, Antivert, Meni-D, Antrizine) or Dramamine. Meclozine reduces the activity of the portion of the brain that controls nausea. These medications are highly effective in most individuals, and thus can be a preventive measure for short trips or for mild cases of motion sickness. Be sure to start medicating the night before the dive trip to start establishing the proper blood level of the drug.

Go gingerly. In addition to medications, many divers swear that the intake of ginger is a simple and tasty way to help avoid getting ill. If this works for you, it’s an easy solution – just carry a Ziploc baggie of ginger snaps aboard and munch on them before and between dives. Although it’s not yet clear to researchers exactly how and why it works, studies show that the ginger root contains a number of chemicals that seem to help relax the intestinal track. As a result, ginger is often helpful in reducing the risk of nausea.

Avoid “conflicting instrument readings.” Look out across the horizon so your eyes can register the same type of acceleration changes your ears are reporting. Avoid visually focusing on things that are close-by, and most especially, avoid reading for more than a few seconds at a time. Also, face the direction the boat is traveling.

Your nose knows. Odors can complicate the mix of signals to the brain, increasing your likelihood of becoming ill. Avoid smelling diesel fumes, cigarette smoke, perfume and of course, anyone else’s vomit.

Minimize movement. Standing in different locations on the boat’s deck will result in different amounts of velocity/acceleration being transferred to your body.

(Continued on page 5)
FCDA Donor

The business listed on this page has donated dive gear and dive services to help support the Fairfield County Diving Association.

11 Quick Tips For Avoiding Motion Sickness by Jim Bartlett (continued)

(Continued from page 4)

Stay topside, close to the center of the vessel.

Keep hydrated. Continue to drink plenty of fluids while on board and throughout each surface interval. This will help keep your stomach more full and will help your body metabolize food and process everything else better.

Stay cool. If you become overheated while on deck, you’ll be more at risk of becoming ill. Wear a cap to keep the sun off your head and face, sit in a shady location between dives and peel off part or all of your wetsuit.

Heads up! If you feel the urge to vomit, move to the leeward rail (with the wind at your back), lean forward and try to direct your explosion toward the sea. The fish will thank you. Never go into the head (marine toilet).

Dive in. If you do begin to feel the early signs of motion sickness, get into the water and submerge several feet below the surface, doing so will usually quell the queasy feelings because your body will stop receiving the conflicting acceleration readings.

Regulate it. If you happen to become ill while underwater, such as just after submerging, it’s usually perfectly OK to vomit in your regulator. It’s not the most enjoyable experience, but it’s typically over very quickly and you’ll feel better almost immediately.

The bottom line is that motion sickness can be managed and/or minimized by planning ahead with sufficient sleep, proper food intake, use of medications and consciously taking avoidance actions while on-board, before the first signs of motion sickness manifest.

Have fun and dive safe!

How Motion Sickness Occurs

Our body’s primary motion-sensors include the inner-ear sensors, our eyes and deeper tissues of the body surface. Technically speaking, the inner-ear sensors detect changes in acceleration rather than motion, such as the movement a boat makes when bobbing on top of waves in the ocean. When our body’s internal instruments sense these acceleration changes, and those changes aren’t confirmed by other sensory inputs, such as visual feedback from our eyes, the conflict in the sets of data they deliver to the brain can trigger motion sickness. Scientists aren’t sure what causes the nausea that comes with motion sickness, but the most popular hypothesis is that the conflicting data from multiple sensors causes the brain to assume that toxins have been ingested, and the body’s automatic response is to internally induce vomiting.

Reprinted from Scubadiving.com March 21, 2013
Most of us probably gained our first insights into buoyancy control as children while learning to swim. At some stage, swimmers realize that if they take a deep breath and hold it, they will probably float. Exhaling deeply causes them to sink.

By controlling your breathing, you learned to control your buoyancy. You also discovered that flapping your arms and legs in a reasonably orderly manner propels you in various directions.

Neutral buoyancy is the seemingly weightless state between floating and sinking. Most of us are approximately neutrally buoyant in our "birthday suit" or swimsuit. However, people with generous deposits of fat tend to be positively buoyant and float, while the more muscularly endowed may be negatively buoyant, and may sink. Dive students soon discover that flapping their arms and various other diving adornments alters their natural buoyancy. They find they must add weight to achieve neutral buoyancy at, or near, the surface.

Controlling your buoyancy is one of the most important skills you'll master. Buoyancy control improves your safety, reduces fatigue and enhances the enjoyment of diving. It also enables you to avoid destroying delicate portions of the underwater environment.

Diving incident reports often cite overweighting and/or poor buoyancy control as a contributory factor to, or a factor associated with, accidents or near accidents. For example, in a study of 100 diving fatalities that occurred in Australia and New Zealand between 1980 to 1987, 45 percent of the victims were believed to have been overweighted, with 40 percent being more than 4.5 pounds/2 kilograms negatively buoyant on the surface.

Another Australian study, which included 533 diving incidents, reported that 57 incidents were associated with buoyancy compensation devices (BCDs), and 27 with weight belts or weights. Many of the BCD incidents were due to diver error, and indicated that the divers didn't thoroughly understand the function of that important piece of equipment. In addition, of the 57 incidents, 21 (37 percent) involved harm to the diver. All these harmful incidents, with three exceptions, were associated with rapid ascents and its consequences.

Despite the importance of buoyancy control to diver safety there is very often inadequate time devoted to realistically practicing and refining buoyancy control skills during a basic diving course. Students are often anxious during their early dives and tend to breathe more rapidly, causing them to float. Many dive instructors add extra weight to students during training dives to keep them on the bottom where they are easier to control. Unless those instructors establish the correct weighting at the end of the course -- something that is easily overlooked in the scurry of events -- many students may leave their dive course and begin their dive careers believing they require more weight than they really do. This is a cause for concern since some accident reports have indicated that the first 20 or so dives carry a substantial risk for the novice.

One method you can use to achieve neutral buoyancy at the surface is to weight yourself so you are suspended vertically in the water with the top of your head just touching the surface with a fully deflated BCD while holding a normal breath. Inhaling deeply should cause you to rise while exhaling should cause you to sink.

There is some debate about whether divers should weight themselves to be neutrally buoyant at the surface or in shallow water. Divers who are neutrally buoyant at the surface may be significantly positively buoyant in shallow water towards the end of the dive when their cylinders are nearly empty and are, therefore, lighter. The amount of positive buoyancy depends largely on the type and thickness of exposure suit and the type and size of cylinder used. This positive buoyancy may make it difficult to maintain your desired safety stop or decompression stop depth at the end of the dive. You can minimize positive buoyancy at the stop by adjusting for neutral buoyancy with a near-empty tank, rather than a full one.

I prefer to adjust my weights so that I am neutrally buoyant at about 15 feet/5 meters with approximately 1320 psi/40 bar of air in my cylinder. This enables me to carry a little less lead, facilitates good depth control at the safety stop and allows me to be slightly positively buoyant on the surface. Exhaling deeply is usually sufficient to descend at the start of the dive. However, some divers may need to duck-dive the first couple of meters.

Wetsuits are made from neo-
The Ups and Downs of Buoyancy Control
by John Lippmann (continued)

(Continued from page 6)

prene, impregnated with tiny air bubbles. When divers descend, these air bubbles are compressed and lose buoyancy. Wetsuits that provide 11 pounds/5 kilograms of buoyancy at the surface will only provide about 2.5 kg of buoyancy at 33 feet/10 meters where the ambient pressure is two atmospheres (ata). At an ambient pressure of five ata, which occurs at 130 feet/40 meters, its buoyancy will be reduced to about one kilogram. In addition to wetsuit compression, the gas spaces within a diver's body compress at depth, further reducing your buoyancy.

You need to compensate for this loss of buoyancy as you descend. Some experts have claimed that divers can increase or decrease their buoyancy by a differential of 4-5 pounds/2-2.5 kilograms simply by exercising adequate breath control. Another report claims that a group of male divers were able to vary their buoyancy by 8.5-15 pounds/3.9-6.8 kilograms by inhaling and exhaling maximally. The corresponding range for females in the study is 6.3-9.6 pounds/2.9-4.4 kilograms. However, divers shouldn't inhale and exhale maximally during a dive since it can cause over-expansion or collapse of alveoli and small airways.

Although breath control should play an important role in the fine-tuning of buoyancy, BCDs are the major tool used to compensate for wetsuit compression. Before the introduction of BCDs, some divers used to take off weights at various depths, reclaiming them during ascent. Others would blow air into their wetsuit sleeves, lifting their arm to release air, as required. Others would use lift bags of various descriptions, while others began to use inflatable life jackets (some probably inadvertently donated by airlines). Eventually, the "horsecollar" BCD was introduced, along with various designs including the jacket, ADV-style, the Travel BCDs, "wings" and others.

Consider a diver who is wearing a 7 mm full wetsuit with attached hood who requires 22 pounds/10 kilograms of weight to be neutrally buoyant on the surface. If we assume that the wetsuit is providing the 22 pounds/10 kilograms of lift at the surface, then, at 130 feet/40 meters, the wetsuit will only provide 4.4 pounds/2 kilograms of lift (one fifth of the surface lift). This means that, ignoring all other factors, the diver will be 17.6 pounds/8 kilograms negatively buoyant at 130 feet/40 meters unless air has been added to the BCD to regain neutral buoyancy.

It is desirable to add air to the BCD during the descent, especially on a deeper dive, since it helps to control the descent and enables the diver to quickly trim off to neutral buoyancy on arrival at the target depth. At times, divers neglect to add air to their BCDs at depth and, occasionally, the consequences are serious.

Researchers conducted a series of experiments to determine the time required to inflate a BCD at various depths. The BCD had an internal volume of approximately 18 liters (i.e. around 40 pounds/18 kilograms lift) and the "reserve" pressure in the cylinder was 35 atm. The tests showed that it required about 57 seconds to inflate the BCD at 100 feet/30 meters using the power inflator. It was not possible to completely inflate the BCD at 100 feet if the diver continued to breathe from the regulator during the inflation since the air supply ran out before the BCD was fully inflated. These results were supported by subsequent, more extensive tests conducted at the Royal Australian Navy School of Underwater Medicine.

The results of both series of tests indicate that divers, who have not attained neutral buoyancy at depth by adding air to their BCDs when there was plenty of air in their tanks, may not have sufficient air left to enable them to regain neutral buoyancy for the ascent. They may have to work hard and, therefore, use up a lot of air in order to ascend. At times, especially if divers are overweighted, they might have great difficulty ascending without ditching their weights.

This situation was tragically demonstrated in Australia some years ago. An inexperienced diver dived to 138 feet/42 meters on a wreck. After he failed to surface, searchers located his body on the seabed. Despite almost 35 atm of air remaining in the victim's cylinder, the search divers were unable to raise his body by inflating his BCD. However, when they release his weight-belt, the diver's body rapidly ascended to the surface.

Later examination revealed that the victim was substantially overweighted on the surface. With the loss of buoyancy from wetsuit compression at 138 feet/42 meters, it

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would have been extremely difficult for the diver to ascend from the bottom without adding a lot of air to his BCD, something he apparently had not done. He may not have been able to inflate his BCD while breathing on his regulator. When investigators tested his BCD later, it took 45 seconds to fully inflate at that depth with 35 atm in the cylinder. To ascend, the victim probably should have dropped his weight-belt. Had he done so, he might have survived.

An interesting study that reviewed the outcome of 37 diving accidents in Tobermory, Canada, indicated that 22 of the 25 divers who made it to the surface survived without permanent injury (despite some suffering from arterial gas embolism and/or near drowning, and some requiring resuscitation). On the other hand, all 12 of the divers who had to be recovered from underwater died.

It is essential that divers wear BCDs with sufficient lift to enable them to maintain neutral buoyancy at the depths to which they dive. The ability to maintain neutral buoyancy at any stage during a dive enables a diver to consume less air and conserve energy, which becomes even more important during a deeper dive. Divers who must exert themselves to maintain position will use more air and may be at an increased risk of an air emergency or decompression illness. Some experts, however, disagree on the amount of lift divers need.

To achieve the most effective lift, divers need to displace water close to their center of mass. Only the portion of the BCD remaining underwater provides lift. Air trapped above the surface in the BCD doesn't provide extra floatation. So, larger volume BCDs will not necessarily provide more surface lift. It depends on the design of the BCD.

Some divers prefer minimal surface lift, desiring only to have their head supported out of the water. Since the human head weighs somewhere in the vicinity of 10 pounds/5 kg, theoretically a similar amount of lift would be required to support a diver's head (only) out of the water, provided the diver was weighted for neutral buoyancy at the surface. Other divers, especially those who often dive in choppy seas, prefer to have significantly more surface lift at their disposal.

The amount of lift required underwater depends mainly on your exposure suit, the depth of the dive and the amount of weight you wear. The larger the volume of the BCD, the greater the lift capacity and the greater the potential for an uncontrolled and rapid ascent.

Larger volume BCDs allow greater air expansion during ascent. Unless you vent the expanding air adequately, your ascent rate will increase, especially as you near the surface. Very rapid and dangerous ascent rates can occur.

A study at the University of California demonstrated these excessive ascent rates. Divers wearing full ocean gear, which included 7 mm wetsuits, were weighted for neutral buoyancy and then positioned horizontally at a depth of 9.4 feet/2.85 meters, holding onto a weighted box. After their BCDs were fully inflated, the divers let go....
and ascended to the surface. Their position changed from horizontal to vertical on the way up. The BCDs tested had lifts of 11.2-54.8 pounds/5.1-24.9 kilograms.

Average ascent rates varied from 68 feet per minute (fpm)/20.6 meters per minute (mpm) with the smallest BCD, to 168 fpm/50.9 mpm with the largest. The maximum ascent rate generally occurred in the last meter or so, and reached a frightening 254.8 fpm/77.2 mpm with the largest BCD. This is certainly much faster than the generally recommended ascent rates.

Obviously, divers need to learn how to use their BCDs safely in order to avoid becoming Polaris missiles. However, the incident reports cited earlier indicate that many divers don't seem to take the time to acquire the necessary skills.

If you find yourself in an uncontrollable buoyant ascent, you should immediately try to vent air from your BCD. If this is not possible, you can slow your ascent rate by extending your arms and legs and arching your back in a "spread eagle" posture while angling the fins to create the maximum drag. You should also exhale forcefully to avoid pulmonary barotrauma.

You can practice buoyancy control by setting a shotline with marks at various levels between about 33 feet/10 meters and the surface. Then ascend or descend to a particular mark, adding or releasing air from your BCD to achieve neutral buoyancy at that level. The next step is to try and maintain that depth by regulating the rate and depth of your breathing, within safe and comfortable limits. Keep your BCD inflate/deflate mechanism readily accessible in case you need to make a quick adjustment. After maintaining the depth level at one mark for several minutes, move to another level and repeat the procedure. Practicing this and various other buoyancy exercises should improve your buoyancy control.

Most modern BCDs incorporate two methods of inflation; oral and power inflation. Power inflation is the preferred method and you should use it whenever possible. Only use the oral inflation if the power inflator malfunctions or to inflate your BCD on the surface if your air supply is exhausted. Power inflator buttons can sometimes jam open. Unless you disconnect the feed hose quickly or continuously dump air from your BCD, you will be rapidly launched towards the surface.

BCDs should have two dump valves. Many have both valves incorporated in the corrugated hose. Occasionally, divers are unable to locate the hose when they need to dump air resulting in a premature visit to the surface. BCDs designed with one of the dump valves independent of the corrugated hose overcome this potential problem.

Some BCDs are quite streamlined, while others have a relatively bulky design. Bulky BCDs create extra drag in the water and may increase the effort of diving.

In the past, many BCDs provided the additional benefit of being able to turn and support an unconscious diver face-up on the surface. This has obvious advantages for the unfortunate diver who ends up in that position, since it's much healthier to breathe air than water. Unfortunately, many modern BCDs no longer provide this benefit.

Another feature that deserves consideration is color. Although a black BCD looks positively sexy, it is not particularly visible to a distant boat operator, especially in overcast conditions and choppy seas. High visibility colors towards the top of a BCD may help locate a diver on the surface and so reduce the Valium intake of the boat operator.

It is also useful to have a pocket to keep various items in.

In summary, the following are features that deserve consideration when purchasing a BC:

- Comfortable, good fit. Should fit reasonably snugly and should not restrict breathing or lift away from the wearer's body when inflated. Many models are adjustable.
- Adequate surface lift.
- Adequate compensation for wet-suit compression at depth.
- Robust bag that is not too bulky (to avoid drag).
- Fittings that are positioned to be readily accessible, easily operated, hardy and reliable.
- Oral and power inflator mechanisms.
- Two dump valves (preferably one independent of corrugated hose).
- Visibility.
- Support of unconscious diver on surface.

Reprinted from Diversaletnetwork.org.
Next FCDA Meeting

Friday, July 31, 2015 - 8:00 PM
Coast Guard Cottage, South Benson Marina, Fairfield, CT

Pre-Meeting Barbeque - 7:00 PM - BYOM*
(* Bring your own Meat)

"Diving Cozumel 2015"

an HD video presentation by
Paul Gacek

Paul Gacek shares his HD video from a trip to Fiesta Americana and Dive House in Cozumel Mexico with New England Dive Center from April of this year. A variety of dive sites - reef, wall, shallow and deep - with the ever present current to propel along at speeds from gentle to express train. Lobsters, turtles, barracuda, schooling fish and even sharks are the high point of each dive. Fiesta Americana is an all-inclusive resort so you never have to meander far for anything!