



UNDERCURRENTS

Newsletter of the Bluegrass Dive Club / www.bluegrassdiveclub.com

July 2012

Volume 42, Number 7

July's Club Meeting

Date: Tuesday, July 10th
Time: 7:30-PM (business)
 Social at 7
Location: The Racquet Club
 3900 Crosby Rd.
Program: Turks and Caicos

President's Message

By Tracey Combs



Happy Summer fellow divers. Don't forget your sunscreen when you are between your dives.

I want to remind club members of a couple upcoming events: the Dive Club Pig Roast and Pool Party and the New Horizons Diving Center (NHDC) Treasure Hunt and Pig Roast. Both events are coming up, so mark your calendars. Check the websites for dates and times. We hope to see you there!

We are updating our Diver Directory for all of our members. The directory will allow the members to be able to contact one another if a dive trip is being planned. This will be available to members only and we will be using your phone number and email on file. If you have changed your phone number or email please let me or Corrine know. 🚩

The Editor's Notes

By John Geddes



Here are a few shots from our BVI trip. We had 25 people on the trip, sharing 3 boats. Most are from the BGDC and I think only five were not members. This trip is always a great one to be on and the diving is always good for me. 🚩



2012 BGDC Officer's

Tracey Combs, President	621-4066
Corrine Mulberry, Vice President	913-0892
Kris Harn, Secretary	278-4246
Dan Miller, Treasurer	948-5133
Doug Geddes, Trip Director	224-3197
Rick Stephan, Safety Info Dir.	223-3719
Mike McCann, Webmaster	255-3937
John Geddes, Newsletter Editor	223-7926

Vice President's Report

By Corrine Mulberry



Turks and Caicos diving is the focus of the July Program – prepared by Noel Hall and presented by Patrick Shackelford. Thanks guys!

If you have diving information that you would like to present at a Club meeting (past or potential dive trip, etc.), we would love to hear from you. Please contact me so that we can put on the calendar! 913-0892 or scubagirl07@insightbb.com



We gave a hearty welcome to **Brian Dawson** who attended his first (or maybe 2nd) BGDC meeting last month. Brian is a firefighter (woo hoo) with the Lexington Fire Department. He is friends with Mike and July Sullivan (don't hold that against him tho.) Brian has about 75 dives and is Advanced Open Water Certified. We appreciated having Brian at the meeting and hope to see him again soon.



We have 2 new members that joined the Club during June: **James Graves** and **Scott Tonkovich**. I introduced James as a visitor at the May meeting and apparently, we didn't scare him off. James has an advanced open water certification and has over 300+ under his belt. He enjoys diving anywhere and wishes he were doing more. We hope to see James on the Morehead City, North Carolina Dive Trip.



Unfortunately, I don't have information about Scott yet, except that he lives in Michigan. I'll find out all the scoop and report back on Scott in the next newsletter.

We're glad to have you both. Welcome James and Scott!



We have one baseball-style cap available for \$12.00. It's the last one. The caps are adjustable, canvas type of material, tan color with the BGDC logo and name embroidered on the front. It may be several years before we order more, so grab it up while it is still available. 🚩

Trip Director's Report

By Doug Geddes



MYSTERY TRIP 2012 REVEALED

Well after months of looking for the best deal, I believe the dive committee found a great spot at a great price. We are going the Roatan, Honduras and staying at the Turquoise Bay Resort. This all inclusive resort features 3 meals a day and 3 boat dives a day along with one night dive. Mike is working on getting this trip up on our website, but if you are interested in going, you need to book your air as fast as you can. We have had so great rates so far and if you are lucky enough to get one of those, your dive trip will be less than \$1350 for the week. The dive package is around \$875.00 including a 16% government tax and our club admin fee of \$10.00. Non-divers are about \$100 cheaper, but get all the alcohol you can drink. We have 15 persons at the moment that have procured their air. Don't miss out on this great, inexpensive dive location. For you non-divers, it has a 5 mile white sand beach. I hope to have a DVD at the meeting on Tuesday.



EAST CAYMAN 2013

This trip is starting to fill up so you need to start considering if you are going or not. The air fares are still very good and you need to lock them in soon. I have heard they are less

than \$500 out of Cincy. This is going to be another great dive adventure at a place we haven't dove in many years, especially this side of the island. Please sign up as soon as you can, so I can get an idea of the actual numbers. We have around 10 persons, including myself already signed up. Come join me on this one.



TRUK 2014

Still waiting for their 2014 pricing, get your name on the waiting list if you haven't already. I know this is going to be an awesome trip. 🚩

From the Treasurer

By Dan Miller



2012 Membership Dues

Student (High School or College ID) ..\$10.00
Single & Family (1 diver)30.00
Family (2 or more divers)40.00

Renewal: Please send payment to the address listed below, please make sure there is a correct indication of your mailing address, phone number and it is very important to indicate an email address.

Contact / Mail to: Bluegrass Dive Club c/o
Dan Miller
824 Gunpower Drive
Lexington, KY 40509

New Members: Visit the website to fill out an on-line form or to access a Microsoft Word printable form. [CLICK HERE](#). 🚩

From The Secretary

By Kris Harn



MAY 22, 2012
BOARD MEETING

Meeting called to order at 7:49. Tracey, Doug, Rick, John, Dan, Kris, Mike, & Corrine in attendance. Dan gave Treasurer's report. Corrine gave updates on door prizes, DVD's for meetings, and new member updates. Rick's article for upcoming newsletter is on sun exposure. John needs newsletters by May the 24th. Mike will be doing a general update on web page. Doug gave report on upcoming trips. Doug announced that there would be no June dive committee meeting. Meeting was adjourned at 9:19pm.

JUNE 12, 2012
REGULAR MEETING

23 people in attendance. Meeting opened at 7:35pm. Corrine announced hats for sale and program for this meeting. Doug reviewed upcoming trips. Corrine announce guest: Brian Dawson. John announced newsletter correction: date of newsletter. No new news from New Horizons Dive Shop. Email Doug if you would like to be on Dive planning committee. 3 door prizes were given out by Corrine. Meeting ended at 8:01pm. DVD on The Philippines presented by Steve and Tamara Williams. 🚩



Safety Corner

By Rick Stephan



Note: We return this month to the subject of fitness in diving, as it relates to aging. This article is from Alert Diver Online and was suggested by Gordon Green. (Thanks!) I think it is a very interesting discussion, as it breaks out the difference between fitness and wellness, and describes some effects on the cardiovascular system. (Note: some of the terms are pretty "medical", but I think our readers can figure most of them out.)

Studies have shown that many serious diving accidents actually occur on the surface, as a diver exerts themselves to get back to the boat, or in rough water or current. By understanding your general health situation, you can avoid getting into a dangerous situation. It is much better to let the divemaster know your health status and let them offer potential solutions than to become another statistic because you were too proud to let people know you have concerns over your ability to do a particular dive.

If you have bad knees, you should let the dive guide know this. (personal experience here) and sometimes they can offer to help you with your tank and weights, to avoid strain. The same thing goes for heart health or vascular problems. Diving is typically not too strenuous, so why make it more difficult than it needs to be?

As always, use good sense. Be aware of your capabilities and make sure your buddy knows of any potential situations.



Remember, safe diving is fun!

Safety Corner Cont.

Matters of the Heart

By Petar Denoble, M.D., D.Sc.

The aging of the dive population and an increased rate of cardiac-related deaths with age in scuba divers are becoming important concerns to the dive community. In a favorable environment, scuba diving is a leisurely physical activity that many people choose for their lifetime or late-life recreation. Age is not considered a disease or a condition that necessarily disqualifies people from diving or any other physical activities, but it is associated with a decrease in functional capacity and an increased prevalence of chronic diseases. Criteria for medical fitness to dive have been defined and used with confidence for more than half a century. When it comes to physical fitness requirements for scuba diving, however, there is no consensus; divers are generally advised to evaluate the diving environment before each dive and avoid strenuous conditions that may exceed their physical capabilities. This approach seems to work for most divers except those who become victims of dive fatalities. Older divers are at greater risk of fatal accidents, and the most common cause of deaths in older divers is an acute cardiac event, which can be considered a sudden death. In this article we will briefly review the epidemiology of sudden cardiac death, age-related changes to the cardiovascular system, specific stressors in diving, the ways these may be related to dive fatalities and what divers can do to mitigate their personal risks.



Sudden Cardiac Death

Sudden cardiac death (SCD) describes the unexpected natural death from a cardiac cause within a short time period (generally within one hour of symptom onset) in a person without any prior condition that would appear fatal. Such a rapid death is often attributed to a cardiac arrhythmia, but because 40 percent of sudden deaths may be unwitnessed it is impossible to tell with certainty.



SCD may be preceded by nonspecific symptoms such as chest pain (indicating ischemia), palpitations (arrhythmias) or difficulty breathing (indicating congestive heart failure). In cases of ischemia or congestive heart failure, the heart muscle fails, and in cases of arrhythmia the synchronization and timing of heart contractions fail. Both result in an inability to maintain circulation, loss of consciousness and, several minutes after circulation stops, death.

SCD occurs annually in 1 out of 1,000 adults in the U.S., accounting for more than 300,000 deaths each year. The risk of SCD in adults increases up to sixfold with age and parallels the risk of ischemic heart disease. Risk is greater in people with structural heart diseases, but in 50 percent of SCD cases individuals were not previously aware of heart disease, and in 20 percent no structural cardiovascular changes could be found during autopsy. Divers with symptoms of cardiovascular disease should be evaluated by a cardiologist and a physician trained in dive medicine regarding their further participation. In people without symptoms, the risk of SCD may be evaluated using known

Safety Corner Cont.

cardiovascular risk factors like smoking, high blood pressure, high cholesterol, diabetes, lack of exercise and being overweight. For example, people who smoke have a risk of SCD two and a half times that of nonsmokers. Effects of “healthy” aging on the cardiovascular system.

We all know a team of young adults will usually outrun and outplay another team made up of middle-aged adults. Those in their 30s and older have already experienced a decline in their personal ability to sustain a high level of exercise for a prolonged period. Decrease of exercise capacity with "healthy" aging can be slowed down with regular exercise, but it cannot be avoided completely. The decrease in exercise capacity is caused by weakened functions of all the body's systems, but we will keep our focus on the heart.

The heart has a natural pacemaker system that controls the heartbeat and the system of pathways that conduct signals to the muscle cells throughout the heart. Over time, the pacemaker loses some of its cells, and pathways may get damaged. These changes can result in a slightly slower heart rate at rest and susceptibility to abnormal rhythms like atrial fibrillation.



With age, all structures of the heart become more rigid. The muscle of the left ventricle gets thicker, and the heart may increase slightly in size overall while the volume of the left ventricle may decrease. The heart may fill more slowly, empty more slowly and, thus, eject less blood into circulation. The increase

in heart rate and cardiac output in response to physical activity get slower, and the maximums get smaller (see table). The decreases in maximal heart rate appear to be an age effect, which is more pronounced in sedentary people and those with overt cardiovascular diseases.

MAXIMUM HEART RATE BY AGE

Age (years)	20	30	40	50	60	70	80	90
Traditional estimate (220-age), beats per minute	200	190	180	170	160	150	140	130
Healthy nonsmokers (208-0.7 x age), beats per minute	194	187	180	173	166	159	152	145

Modified from Tanaka H. Age-predicted maximal heart rate. J Am Coll Cardiol, 2001; 37:153-6.

The autonomic nervous system changes with age, too. Normally, the parasympathetic side sets the basic resting heart rate, while the sympathetic side affects the heart in anticipation of and in response to physical activity, stimulating timely and proportional increases in blood circulation necessary to support ongoing activity. Continuous adjustment between the sympathetic and parasympathetic systems results in a heart-rate variability evident on a beat-to-beat basis, which is a sign of a healthy control system. With age, the contribution of the parasympathetic side wanes, the sympathetic activity increases (even at rest), heart-rate variability disappears and heart rhythm becomes more prone to derailments. Low heart-rate variability and increased resting heart rate (due to loss of parasympathetic tone) independently increase the risk of SCD more than two and a half times.

Effects of diving on the cardiovascular system
Diving exposes divers' bodies to various stressors that independently affect cardiovascular function. The major stressors are immersion, exposure to cold, increased partial pressure of oxygen and increased work of breathing.

The combined effect of these factors is that the volume of blood in the vessels of the chest and heart increases significantly, stretching the walls of heart and large vessels. Pressure in the right atrium and blood pressure slightly increase — more so in cold water. The heart has to work harder to maintain circulation.

Safety Corner Cont.

These conditions contribute to various arrhythmias, from bradycardia (slow heart rate) caused by cold to tachyarrhythmia (racing heart rate) caused by cardiac and neuroendocrine responses to stress. Older people, especially those with structural cardiovascular changes and weaker function, are at greater risk of adverse reactions to these stresses.

The autonomic nervous system is affected by diving, too. In healthy individuals, diving increases parasympathetic effects on heart rate, and heart-rate variability is preserved. Diving that is perceived as stressful pushes the balance of the autonomic nervous system in the other direction: Sympathetic effects prevail and increase the heart rate, diminish heart-rate variability and increase the risk of arrhythmia.



Although diving is often perceived as a leisurely activity, the level of exertion may sometimes exceed the physical capacity of divers with functional limitations as well as healthy but older divers. In weightless conditions of immersion, muscular work is less punishing and divers easily exert themselves beyond their cardio-respiratory limits. Most divers regard swimming against a 0.5-knot current as a challenge. Heart rates measured in trained military divers during shallow underwater swimming increased to an average of 101 beats per minute (bpm) in a 0.6-knot current and to an average of 141 bpm in a 1.2-knot current. For many divers this would exceed a sustainable level (which is usually considered to be less than 80 percent

of the maximal heart rate). Even more important, divers who do not regularly practice swimming and do not master the technique of underwater swimming with fins as well as those who do not streamline their gear and especially those whose buoyancy is a bit off, would probably reach their maximal heart rate while swimming even more slowly. Some may reach their limit just trying to stay afloat.

What are the risks?

Fatality statistics indicate at least one-third of all dive fatalities are related to an acute cardiac event. The risk of cardiac-related death in divers is continuous, steadily increasing with age; divers older than 50 have a risk 10 times that of divers under 50. While some suspected cardiac events may be provoked by specific dive effects, some may be not related to diving at all, as sudden cardiac deaths occur in swimming, land-based sports, at rest and during sleep.

An acute myocardial infarction (heart attack) due to exertion while swimming against current, waves or excessive negative buoyancy is probably quite common among dive-provoked fatalities. It is caused by insufficient blood supply to working heart muscle. This occurs most commonly in middle-aged male divers unaware of their coronary artery disease.

It is also reasonable to expect diving could provoke an acute arrhythmia, which might result in sudden death. The arrhythmia is a more likely cause of death for older divers. As Carl Edmonds, M.D., describes and DAN® data confirm, "The victim often appeared calm just before his final collapse. Some were unusually tired or resting, having previously exerted themselves, or were being towed at the time — suggesting some degree of exhaustion. Some acted as if they did not feel well before their final collapse. Some complained of difficulty in breathing only a few seconds before the collapse, whereas others underwater signaled that they needed to buddy breathe, but rejected the offered regulator. Explanations for the dyspnea include psychogenic hyperventilation,

Safety Corner Cont.

autonomic-induced ventilatory stimulation and pulmonary edema — the latter being demonstrated at autopsy. In all cases there was an adequate air supply available, suggesting that their dyspnea was not related to equipment problems. Some victims lost consciousness without giving any signal to their buddy, whereas others requested help in a calm manner."

SCD occurs at comparable rates and a nearly identical age-related pattern in diving and in the general population, but a causative relationship between diving and SCD should not be dismissed. SCD cases without an obvious external provocative factor are more common in older divers. Medical examinations in such cases reveal signs of heart disease rather than identifying a specific event that caused SCD. Outcomes of these diving fatalities might not be different than SCD cases in the general population except the divers usually do not have a chance of being resuscitated. The best way to avoid SCD is to prevent heart disease and maintain wellness and physical fitness despite aging.

Fitness and wellness programs

Physical fitness is the ability to move in a physical world and change it by muscular effort. There are many components to it; the main one is a capacity to conduct aerobic work. Good health and fitness in older age is a matter of absence of disease, lifelong healthy habits and fitness maintenance. Adopting a healthy lifestyle at any age will improve quality of life, but a return to the normal curve of fitness and longevity is probably proportional to previously acquired insults. According to recommendations of the American College of Sports Medicine (ACSM) and the American Heart Association (AHA), regular physical activity, including aerobic activity and muscle-strengthening activity, is essential for healthy aging. The U.S. Department of Health and Human Services published physical activity guidelines that can be found at www.health.gov. Benefits of exercise are many, and they are dose

dependent: The more one exercises, the greater the benefits are. These include reduced risk of cardiovascular disease (and thus, SCD), thromboembolic stroke, hypertension, type-2 diabetes, osteoporosis, obesity, colon cancer, breast cancer, anxiety and depression. The ACSM and AHA maintain that with sufficient skill, experience, fitness and training, older adults can achieve high levels of physical activity. At the same time, for some older adults, age-related fitness loss, chronic diseases and functional limitations act as barriers to attaining high levels of activity.



While the health benefits of physical activity may be achieved with low to moderate levels of exercise, this may not increase aerobic capacity or improve fitness for swimming against a strong current. A high level of aerobic fitness may be acquired and maintained only by regular vigorous exercise, as approved by physician. Fitness for swimming against a current includes fin-swimming skills. Divers without these skills may not be able to create sufficient propulsion to overcome strong current despite their high aerobic capacity for muscular work. Thus, part of divers' exercise must be dedicated to fin swimming.

Wellness

Wellness may be defined in various ways, but it is in essence a subjective state of satisfaction with one's present condition, which depends greatly on underlying health and, at the same time, helps improve health. One example of a practice that may help individuals achieve wellness is yoga. Yoga seems to affect flexibility, posture, balance and muscular strength. Relaxation and breathing techniques seem to reduce overall

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sympathetic tone in older adults, increase parasympathetic effects on heart rate and potentiate heart-rate variability. Regular yoga practice reduces anxiety and improves overall wellness.

Feelings of wellness do not necessarily coincide with physical fitness. People who do not do regular, vigorous exercise may discover their limitations in the face of a challenge — only when it is too late. For enthusiastic divers, diving may be very important for achieving wellness. To promote continued fitness for diving, divers should maintain a healthy lifestyle, exercise regularly, practice specific skills for diving, use all means to achieve wellness and make wise choices in diving. 🚩



Bluegrass Dive Club 2012 Calendar

July

- 10, Tuesday Dive Club Meeting
- 14-15, Sat-Sun Dale Hollow trip
- 24, Tuesday Board Meeting



August

- 14, Tuesday Dive Club Meeting
- 18, Saturday Club Pig Roast
- 28, Tuesday Board Meeting



September

- 11, Tuesday Dive Club Meeting
- 25, Tuesday Board Meeting



October

- 9, Tuesday Dive Club Meeting
- 30, Tuesday Board Meeting

November

- 13, Tuesday Dive Club Meeting (Elections)
- 27, Tuesday Board Meeting

