

DIVER EDUCATION SERIES

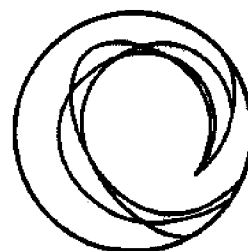
Drinking and Diving

Lee H. Somers

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MICHU-SG-86-511

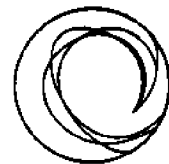
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**Drinking and Diving:
If You Can't Spit Don't Dive!**

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This publication is the result of work sponsored by the Michigan Sea Grant College Program with grant NA85AA-D-SG045 from the National Sea Grant College Program, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, and funds from the State of Michigan.

Ordering information for additional copies of this publication can be obtained from: Michigan Sea Grant Publications, 2200 Bonisteel Boulevard, The University of Michigan, Ann Arbor, Michigan 48109; 313/764-1138.

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Price \$1.00

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DRINKING AND DIVING: IF YOU CAN'T SPIT, DON'T DIVE!

Lee H. Somers, PhD

It is a cold, snowy Saturday morning as you drive anxiously to Detroit Metro Airport. Today is the first day of your long-awaited scuba diving vacation in the Caribbean. You completed your training about two years ago but have only dived a dozen or so times in local lakes and quarries.

Your luggage is checked, and finally you board Aquasonic Airline Flight 469 for Miami where you will make connections for your final destination in the Caribbean. A few minutes after the plane reaches cruising altitude a gentle voice announces that beverages will be served for your relaxation and enjoyment. Fruit juices, soda pop, and coffee are complimentary; however, beer and wine are available for \$1.50 and mixed drinks for \$2.50. It has been a long week of overtime work and final preparations. This is your vacation! Why not start the morning with a Bloody Mary? The stewardess announces that Aquasonic Airline is pleased to introduce their new drink coupon book which allows you to purchase 10 in-flight drinks for \$15. Why not? You can save \$10! A couple of hours and three Bloody Marys later you arrive at Miami International.

You have booked your diving tour through Scuba Sun Score (SSS) Tours. Since SSS clients from all over the country will be arriving in Miami today, a special courtesy room has been reserved by the company where you can meet your fellow divers, your tour leader, enjoy a few complimentary drinks, and relax before continuing on to the Caribbean in about three hours.

At 2 PM you board Island Buzzard Airline for your final destination -- Paradise Island deep in the Caribbean. Island Buzzard is a new airline and like many developing businesses, it provides "perks" to encourage booking. This island flight includes complimentary rum punch. Fantastic! It's all free, as much as you want. Paradise Island has just launched a big campaign to attract American tourist dollars. So you pass quickly through immigration and are greeted in the customs area by a lovely young lady with a tray of small plastic glasses filled with complimentary rum punch. After all of the horror stories you have heard about customs and long delays, this is a delightful surprise. Customs goes so smoothly that you have time for only two glasses of the rum punch.

A taxi whisks you off to your dive resort hotel, which is considered to be one of the best in the Caribbean. Your tour guide has your room key waiting for you when the taxi arrives, and your bags are tagged so that you can proceed directly to your room; the bags will follow. As you enter your luxurious room

one the of first things that you notice is a bottle of Champagne, compliments of the hotel management.

Off with the travel clothes, on with the bathing suit. A quick check of your relaxation itinerary indicates that you have only 30 minutes before the Rum Punch Pool Party sponsored by your local dive guides. This will be an excellent opportunity to meet the diving staff and to find a few good diving buddies for the week, not to mention the opportunity to scout out the unattached members of the opposite sex. Dinner is not served until 8 tonight, and your table has already been reserved by your tour guide. You have two full hours to get acquainted, relax, and drink free rum punch. What a way to start a vacation!

Dress is casual at this resort. After the party you quickly slip back to your room and change into you best jeans and wildest T-shirt for dinner. The sun has disappeared below the horizon and the evening is warm, but not hot. The open air restaurant is beautiful, just like the picture in the brochure. Your table is directly on the ocean and you can see small schools of fish waiting for their evening handout. The waiter asks if you and your companions wish to begin with a before dinner drink. You hesitate! Your mind is a bit slow now -- lovely companions, tropical moonlight, gentle breeze, and a nice rum punch buzz. For a brief moment you start to ask yourself, "Do I have enough money to buy dinner drinks and wine?" Then reality returns! Your mind clears! You can have all of the dinner drinks you want. Your Scuba Sun Score dive package includes transportation, all meals, gratuities, unlimited diving, and unlimited beer, wine, and mixed drinks. What a deal!

The waiter returns in a few moments with your drinks and recommends the house specialty -- swordfish steak and a unique complementary wine. You are not normally much of a wine drinker, but why not? It is all part of the package. The dinner is just great. It seems like you have been eating, laughing, and drinking for hours. The very interesting and, you hope interested, person next to you recommends that you all top off dinner with a wonderful after dinner liqueur -- Tia Maria. Now, that is what you call dessert!

The night is still young when you and your new friend skip off to the casino. Maybe you can win enough money to buy that underwater camera you have wanted for so long. As in most casinos, drinks are on the house when you are gambling. Now you are really living. The Bond in you is finally surfacing. This is the beginning of a wonderful week and a new life.

About 2 AM you begin to feel very tired and ask to be excused. You won't score tonight. The mixture of rum punch, scotch and soda, wine, Tia Maria, and gin and tonic has made you just a little drunk and a bit ill. No matter! This is your first night on the island. You are allowed to let off some steam after so many months of hard work.

Breakfast is at 7:30. Your tour guide awakens you with a gentle tap on the door and informs you that you should finish breakfast and be on the dock by 8:30 so that you can be briefed on the day's diving activities and get your equipment organized on the boat. As you lift your head from the pillow the room starts to spin slowly, and you attempt to focus your eyes on the small dog that must have had an accident on your tongue during the night. A quick shower and some mouth wash and you are off to breakfast.

There is a large pot of coffee waiting on every table. Boy, do you need it! The breakfast includes a nice 4-ounce glass of orange juice. Wow! Does this juice taste good. You ask the waiter if you can have some more. He says certainly. You drink six more glasses. Time to go to the boat. As you start to leave your table, the waiter asks you to sign for the extra orange juice you ordered -- \$1.50 per glass. You just drank \$9.00 worth of canned orange juice. Only the first one was included in your meal plan.

On the way to the dock you run into your tour guide and complain. He is sorry that you were unaware of the extra charges for additional food, juices, etc. However, he reminds you that if you like orange juice so well, screwdrivers can be obtained at the bar from 7 AM to 3 AM and that the cost of all mixed drinks is included in your tour package. You'll know better tomorrow morning!

On the way to your dive site you soak up the hot tropical sun. This morning you will make a boat dive and return to the hotel for a second dive from the beach. The water is warm and clear -- the clearest that you have ever seen. At last you are underwater in the beautiful Caribbean. You forget the slight nausea and headache and drift effortlessly through the coral seascape. Your maximum depth is 70 feet and your air lasts right up to the the USN "no-d" time allowed. You are going to get every minute underwater that you can on this vacation.

When you surface from the dive the divemaster offers you a cold drink -- coke or beer? Boy, a beer sure would taste good right now and wash the taste of saltwater away. You lie back to enjoy the ride back to shore and your nice, cold beer. You know, that was really thoughtful of the divemaster.

As soon as you arrive back at the hotel, you pick up a second cylinder of air for a beach dive before lunch. You and your new buddy check the tables and plan a 40 minute dive to 40 feet. It is such a beautiful day. After surfacing from the second dive, you hurry to lunch. The boat will leave the dock for your afternoon dive at about 2 PM.

Today's lunch is buffet-style on the patio overlooking the ocean. You can't decide whether to have a cold beer or a large glass of rum punch. The rum punch has lots of fruit juice, and you recall that your instructor told you to drink plenty of fruit

juice between dives. The orange juice will cost you extra. The rum punch is included in your dive package. Rum punch it is!

The afternoon dive is even more beautiful than the morning dive. About 4:30 you return to your room for a quick shower and an aspirin. You have a bit of a headache. Must be the hot tropical sun. You rest for a few moments and hear a knock on your door. Your interesting new diving companion doesn't want to miss the afternoon cocktail-game party on the patio.

This afternoon's game is "tequila trivia." You love to play Trivial Pursuit, and you are good at it. In this version of the game, you get a shot of tequila if you are the first person to shout out the correct answer. Most of the divers are on the patio by the time you and your buddy arrive, and the game is about to start. The first question is, "What do the letters S-C-U-B-A stand for?" You leap into the air and call out "self-contained underwater breathing apparatus!" Correct! You get the first shot of tequila. As you gulp it down, the crowd cheers. You never have been much of a tequila drinker, and this cheap stuff tastes like something they distilled in a goat's bladder. However, a beautiful lady in a skimpy bikini runs up to you with a slice of lime for you to suck on and that makes it taste much better. In a few moments you answer another question and the ceremony is again repeated. And again! And again! Your second night on the island and you are already a celebrity. You are the "tequila trivia" champion.

The divers from your boat hoist you on to their shoulders and carry you off to dinner. Tonight's dinner is even better than last night's and the wine is absolutely perfect. The warm, moonlight tropical night is casting its magic spell. Good food! Delightful new friends! Island music in the background! What more could you want? You are simply "floating!" Then it happens. You feel the gentle touch of someone's fingers against your hand. Fantasy becomes reality -- the gentle warm breeze, the sound of the waves beneath your balcony, the complimentary champagne, and paradise.

The sun is rising in the east as you sip the last of the champagne to toast a new day and a new love. In a few hours you and your buddy will again slip beneath the waves to seek new adventure and rewards. A couple of hours later you are awakened by your tour guide. If you do not hurry, you will miss the boat. No time for breakfast. You and your buddy arrive at the boat just as it is leaving the dock. Fortunately, your tour leader put your equipment bags on board.

Today you will be diving the wall at the north end of the island. There will be about a 20-minute boat ride and the water is a bit rougher than yesterday. You are so thirsty. The divemaster realizes that you missed breakfast and offers you a coke -- you drink two. About five minutes before you arrive at the dive site you realize that you can't control it any longer and, half dazed, you make your way to the side of the boat to

feed the fish. Naturally, your diving companions find this a bit humorous and you hear someone say softly, "If you want to play, you have got to be willing to pay!" You did pay -- for the deluxe dive package -- and you are just beginning to play.

The week passes so quickly. Every dive is a beautiful adventure. You dive to the limit every day. The nights are even more beautiful. Crab races! Tequila trivia! Rum punch parties by the pool! Dancing! Gambling! Romance! This is the beginning of a new life!

Friday morning comes far too soon. You don't really remember coming home from the midnight pool party last night. And you are sure that the little dog is still hiding somewhere in your room. Your muscles ache, at least some of them. Your head hurts and you are a bit dizzy. However, three or four cups of coffee, some aspirin, and a couple of those orange juice screwdrivers and you'll be as good as new.

Today is the big south end deep wall dive -- something you have been waiting for all week. They say it is the most beautiful dive in the Caribbean. And this will be your first really deep dive -- 120 feet. The boat arrives at the site and the divemaster briefs the divers. You will spend 10 minutes at 120 feet and then return to the top of the wall and burn off the rest of your air at about 40 feet. You are instructed to make a 5-minute decompression stop at 10 feet during ascent.

You hurry to get into the water. You don't want to get seasick by staying on the rocking boat in the hot sun. Besides, the scuba harness is hurting your badly sunburned shoulders. You just need to defog your mask and you will be ready to enter. However, you simply can't spit. You try to get enough saliva in your mouth to spit and you can't! The divemaster hands you a small bottle of defog compound and you are on your way.

The dive is everything that they said it would be and more. There are simply not words to describe the splendor of the wall -- being suspended over the transparent dark blueness of the abyssal depths below you. As you glide effortlessly along the wall you touch the beautiful whip gorgonians and admire the tiny black-capped basslets. In your euphoria you reflect on the wonderful vacation and dream of future undersea adventures. You ascend to 40 feet and swim with your companions back to the boat. As you look up you see several divers already suspended below the boat on the decompression bar. The most magnificent dive of your life will be over in a few minutes.

As you board the boat your tour guide hands you a cold glass of champagne -- a fitting act of celebration. It is wonderful to be alive! It is wonderful to be a diver! As your boat speeds back to the hotel you realize that you are really tired and a bit shaky on your legs. It has been a long, exciting week and you had a late night. You will have several hours to rest and eat before your afternoon dive.

As you are walking back to your room you realize that your legs are still a bit shaky, a bit weak. You also have a slight backache -- probably from lifting tanks on the boat. In your room you lie down for a few minutes and feel a strange sensation in your feet and lower legs. It is a feeling like that you have experienced when you have fallen asleep on your arm -- sort of a "pins and needles" sensation. You get up to go to the bathroom and can hardly stand because your legs are so weak and your foot feels numb. What's happening? You make your way to the balcony and call to your dive buddy and tour leader at the pool below. In a few moments they arrive in your room. By now you are having difficulty walking. They help you back to the bed.

It is about four hours later now. You are lying in your bed breathing from an oxygen mask. You can no longer move your legs and you have no feeling below your waist. Fortunately, a diving doctor is staying at the hotel and the small clinic has some appropriate IV medications. The doctor informs you that you are exhibiting symptoms of decompression sickness -- the bends. He has placed you on oxygen and started an aggressive fluid replacement procedure since you appear to be extremely dehydrated. How can this be? You have **drunk** more this week than ever before in your life. An air ambulance has been called to transport you to the large NOAA hyperbaric chamber facility in Miami.

Nearly three weeks have passed since your accident. The flight attendant announces that you will be landing at Detroit Metro in approximately 10 minutes. A lot has happened in these three weeks. You have undergone six hyperbaric treatments in Miami and spent about two of the weeks in an intense physical therapy program. You have no control of your bladder and apparently no sexual sensation. Your mind drifts!

As the plane pulls up to the terminal you realize that family and friends will be waiting to greet you. What will you say? What will they say? There is the usual confusion and hurry of passengers anxious to get off of the plane and on with their lives. You are in no hurry. You are content to let all of the other passengers deplane before you. As the sky-cap pushes your wheelchair into the terminal, you see the faces of your friends and loved ones. There is both joy and sadness. It is time for you to get on with your life -- a new life!

* * * * *

The story you have just read is fiction! However, every event is real. I have seen, experienced, or heard accounts of every one. I have treated paralyzed divers. I have read dive boat tour advertisements that state, "**complimentary beer and wine on tap.**" I have listened to a noted dive tour organizer talk about successful efforts to arrange a Caribbean diving holiday which includes all transportation, three dives daily, room, tips, taxes, transfers, parties, T-shirt, and all meals and **beverages** (which specifically includes an open bar policy).

Of even greater concern is the serious promotion of the party atmosphere and the often less than serious promotion of the safe diving aspects of dive travel. Many divers have told me that they drink far more on diving vacations than they do at home. A diver who was making about four dives per day and experienced a mild case of bends was considered as a mild drinker when he consumed only 5 to 6 beers in the evening and went diving at 6 AM. At many, if not most, dive resort restaurants one must specifically request water; far too often the divers will order beer or a rum drink with the noon meal.

It is not my responsibility or purpose to attempt to eliminate consumption of alcoholic beverages or, as some would say, the fun, from diving holidays. I enjoy a drink, in fact several of them, just as much as the next person. However, there is a time and a place for everything. **The diver who chooses to accept the adverse consequences of mixing alcohol and diving is assuming a significant risk!**

The late Dr. Charlie Brown classified alcohol as "the grand champ of the downers" [2]. What happens to the body and mind when one consumes alcohol? Alcohol is a depressant drug which slows the activity of the brain and central nervous system. Any drinking causes some temporary effects on the body. Sustained and heavy drinking can result in serious problems.

Alcohol enters the bloodstream through the stomach wall and the small intestine, and requires no digestion. A low level of alcohol, such as sipping one drink, has a mild tranquilizing effect on most people. It may act as a temporary stimulant when one is first starting to drink. This results in increased heart rate and skin temperature. After a drink or two, as the alcohol numbs the brain and central nervous system cells, loss of muscle control, slurring of speech, and poor coordination result. Impaired judgment and loss of inhibition, along with exaggerated feelings of anger, fear, and anxiety also occur.

The physiological and emotional adversities associated with consumption of alcohol immediately before and between dives are obvious. A couple of quick beers between dives can contribute significantly to increasing the diver's cooling rate, reducing muscle control and coordination, impairing the diver's ability to make proper judgments, promoting "risk taking" and triggering fear/anxiety responses (or panic).

Consuming a tropical punch containing 4 to 5 ounces of rum before a dive can place the diver in a state of being legally drunk underwater (.1% blood alcohol). Would a diver ever drink this much before a dive? In some cases, yes! Most people associate the "quenching of thirst" with the consumption of beverages. If a good rum punch is available, few divers stop at one! Studies of automobile accidents suggest that this level of blood alcohol increases the likelihood of an accident 7 times; a blood alcohol content of .15% increases the rate 23 times [2].

Alcohol is a relatively potent diuretic and tends to increase the flow of urine. It suppresses the release of a hormone that normally retains body fluids. As a result your body loses important fluids and you become dehydrated. The problem of dehydration and fluid loss is further complicated by the fact that our bodies often do not adjust to the tropical climate until several days after arrival. Under normal conditions, our thirst mechanism warns us when we need liquid. For some reason, this mechanism often does not work during the first few days following arrival in the tropics. Even though perspiring increases we do not tend to drink sufficient and proper fluids required to replace those lost and thus acclimate to the tropics. Prudent divers (travelers) will "force" themselves to drink enough water and fruit juices to maintain a urine output of at least two pints of reasonably clear urine per day. As stated in one British guidebook, "A few dark-colored drops and a puff of steam are not enough" [3].

Diuresis is also triggered by the consumption of beverages such as tea, coffee, and carbonated drinks that contain caffeine. Most people drink large quantities of coffee in the morning after consuming large quantities of alcohol the night before. This only complicates the situation physiologically. Additionally, chilling (losing heat to the surrounding water), negative pressure breathing, and submergence itself all tend to increase diuresis. It is a well established medical fact that dehydration results in blood thickening and reduced circulatory efficiency. Reduced circulatory efficiency may in turn modify the normal nitrogen absorption/elimination functions and contribute to the formation of extravascular bubbles, i.e., decompression sickness. **Dehydration may be the most significant single physiological factor that leads to degradation of diver performance and increased susceptibility to decompression sickness in tropical diving!**

Exercise followed by consumption of alcohol can be particularly dangerous, since this combination can cause significant decrease in blood-glucose levels. Low blood glucose leads to general physical weakness and mental confusion as well as interfere with body temperature maintenance [1].

Furthermore, pre-dive consumption of alcohol causes skin vasodilation (blood vessel expansion) and increases the nitrogen uptake in subcutaneous (under skin) fat. The post-dive drink favors rapid release of this nitrogen into general circulation, which, in turn, favors the development of decompression sickness. Alcohol also reduces surface tension thus favoring conditions for bubble formation and growth. Finally, it increases blood plasma fat, which favors fat emboli and blood clotting, both important in the pathogenesis (development) of decompression sickness [2]. These factors all theoretically support the premise that alcohol may increase the risk of decompression sickness. However, further research will be required to determine relationships.

All evidence suggests that drinking and diving are not compatible activities. Alcohol is frequently associated with drownings. An analysis of drownings in the United States and Australia indicates that about 50% of the adult victims have elevated blood alcohol levels [1]. Unfortunately, similar blood studies are not available for those persons who experienced fatal diving accidents. The individual who does drink before and after diving is probably at a **significantly higher risk** of accident and/or decompression sickness than those who abstain. Can you drink and dive in moderation? How much can you safely drink in a diving situation? How long should you abstain from drinking before diving? Will a beer between dives really do any harm?

I can't answer these questions! There are simply too many variables. Keep in mind that physiologically you are not always the same person. A level of consumption normally tolerated can produce serious and adverse consequences if you are dehydrated, fatigued, or otherwise physiologically compromised. All of these factors can easily be associated with tropical vacation diving. Some authorities suggest that an individual refrain from drinking alcoholic beverages for at least 6 to 12 hours prior to diving, while others suggest that abstinence for 36 to 48 hours is more desirable.

I suggest that all divers and dive resort operators re-evaluate their position on alcohol and diving. In my opinion, promotion of alcohol consumption through parties and games in a diving environment is a questionable practice. The advisability of an open bar policy on dive boats and at dive resorts is also subject to serious reconsideration. The practice of serving complimentary alcoholic beverages between and following dives is questionable.

Ultimately, as an adult each diver is responsible for his or her personal health and safety. The boat and resort operators are only responding to client and social pressures. Our society is a drinking society. And there is big money in satisfying the customer. Availability of alcoholic beverages does not mean that the diver has to drink. It is all a matter of "risk/benefit." If you are going to drink and dive you must be willing to **accept the risk and the consequences**. Did you pay \$100 to \$200 per day for a vacation to drink OR dive? Both! If that is what you wish, then so be it. However, sue yourself, not a dive boat or resort operator or your instructor when you find yourself confined to a wheelchair.

As far as the dive operators are concerned, I suggest that making water and fruit juice readily and attractively available would be a significant contribution to diving safety that could pay long-term dividends from both a legal and moral standpoint. What is wrong with offering a diver a complimentary can of fruit juice between dives or at the end of a day's diving? It makes a lot more sense.

I know that divers will continue to drink. If a dive resort did not serve alcoholic beverages or a dive boat operator prohibited the possession/use of alcohol, it would probably be out of business within a few months. Just keep it all in proper perspective. And when you wake up in the morning the next time you are at a dive resort, remember "If you can't spit, don't dive!"

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3. Hatt, J., The Tropical Traveller (London: Pan Books Ltd, 1985).