SPC 641

Specialty

"We believe in the impossible and achieve the unimaginable."

Accredited by the Alliance of Marine Mammal Parks & Aquariums

Association of Zoos & Aquariums

Georgia Aquarium University est. 2011

PADI Manta Ray Specialty - Course Objectives

Course Overview

The purpose of the PADI Manta Ray Distinctive Specialty Certification at Georgia Aquarium is to familiarize student divers with physical characteristics, habitat, and conservation efforts for manta rays, the world's largest ray, as well as to learn the skills, procedures, techniques and excitement of diving within the largest aquarium habitat in the world. This course promotes manta ray conservation by allowing the student diver to closely observe these gentle giants, thereby establishing a stronger emotional connection with them. This connection and the conservation messages presented in the class will inspire the student diver to more actively support and promote manta ray conservation.

This course is intended as a safe, supervised, diving experience with emphasis on safety, excitement, education and conservation. Georgia Aquarium is the only facility in North America to offer this unique and distinctive specialty, guaranteeing that the student diver will have the opportunity to dive with manta rays and closely observe them first-hand. The diver will also be able to see whale sharks and over 50 other species of marine fishes.

Course Objectives

Upon completing the PADI/Georgia Aquarium Manta Ray Distinctive Certification course the student diver will be able to:

- Demonstrate diving skills and procedures, including recognizing and avoiding potential hazards, while making diving among manta rays safe and fun.
- Demonstrate proper diving techniques with an emphasis on buoyancy control needed for diving within the environment of Georgia Aquarium while among the manta rays.
- List the physical characteristics and names of the Aquarium's four manta rays.
- Describe the conservation efforts and values of the program as embodied in the manta ray conservation program at Georgia Aquarium.

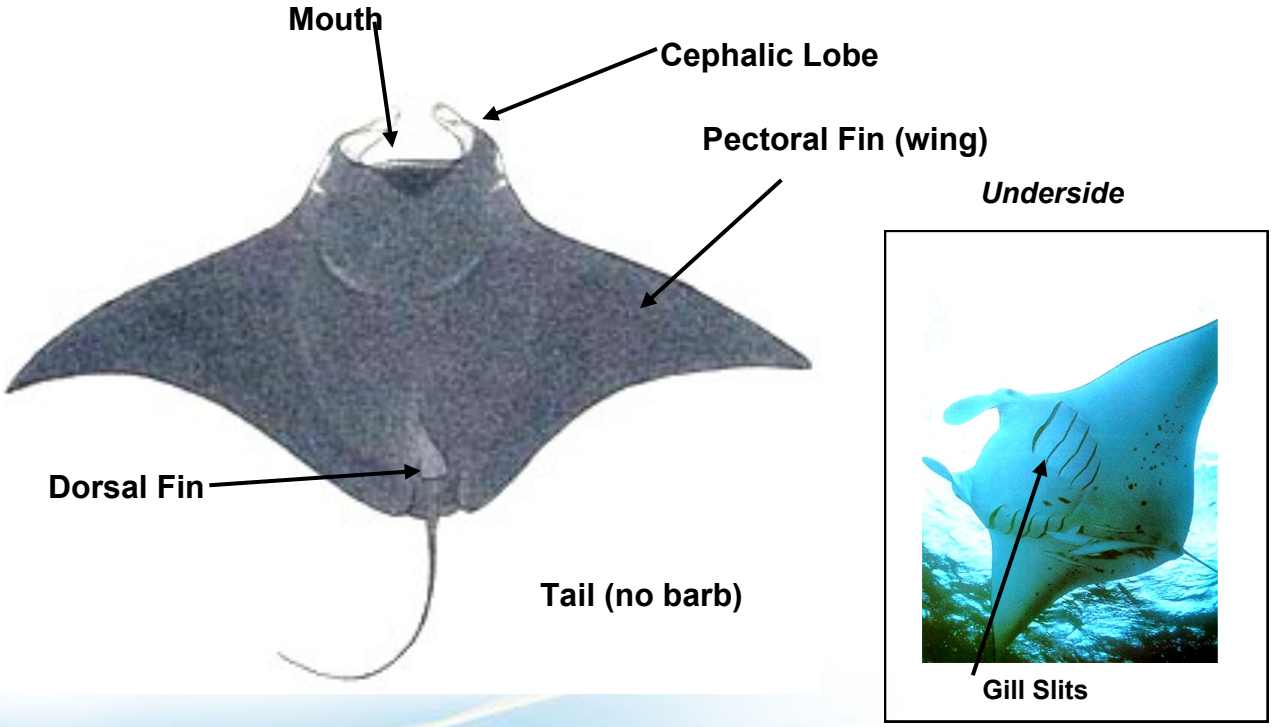
PADI Manta Ray Specialty - Overview

Manta Ray Overview

The Georgia Aquarium manta rays came from South Africa and Florida. Our first manta ("Nandi") was acquired from the South African Association for Marine Biological Research. In 2007, Nandi became entangled in shark nets protecting a beach near Durban, South Africa. She was brought to uShaka Marine World to recover from minor injuries she incurred in the nets. When she outgrew her habitat there, GAI arranged to have her shipped to Atlanta. She arrived in August 2008.

Our other three manta rays were acquired from the waters off the East Coast of Florida where mantas congregate each spring. After a short period in quarantine, they were released into the Ocean Voyager habitat. They were introduced into the exhibit between July 2009 and August 2010.

Georgia Aquarium has received awards for our work with mantas. We continue to educate the public about this magnificent species.



PADI Manta Specialty - Our Mantas

Georgia Aquarium's Manta Rays

Georgia Aquarium is the only facility in North America to house and exhibit manta rays. We are one of only four venues in the world to house these graceful rays. The 6.3 million gallon Ocean Voyager habitat was designed specifically to accommodate large marine animals, based on the many years of experience of aquariums in Japan, Taiwan and elsewhere. We expect all of our animals to have a long life here in Atlanta.

Our Mantas

- Three sub-adult females, **Nandi, Tallulah** and **Female #3** plus one juvenile male, **Manta #4**
- Nandi has a dark back with white patches on her "shoulders"
- Nandi's belly is all white with a very few dark spots
- Tallulah is also our largest manta at almost 12 feet across.
- Tallulah has a solid black back , a white belly and broad grey splotches near the leading edge of her wings.
- #3 closely resembles Tallulah: black back and white belly, but with four distinct dark, oval spots.
- Manta #4 resembles the latter two black back and white belly, but with two distinct dark, oval spots.
- The mantas range from about 10 -12 feet across. Each are target-fed krill and small fish using ladles on poles. Feeding is done from the edge of the habitat.

What's in a Name?

Nandi was named for the mother of *Shaka*, king of the Zulu kingdom, in deference to Nandi's land of origin.

Tallulah is derived from a Cherokee Indian word meaning "leaping waters." Tallulah Gorge is a Georgia state park .

Georgia Aquarium Manta Ray Program

The Aquarium is advancing scientific understanding of manta rays by combining field research with in-house study through our 4R Program. Georgia Aquarium performed aerial surveys of manta rays off the East Coast of Florida for six weeks during spring 2010, in collaboration with the Associated Scientists at Woods Hole.

The aerial surveys were flown over a specific tract of ocean near St. Augustine in an area known for its spring-time aggregation of manta rays. The flights followed fixed lines parallel to the coast, called 'transects," and were repeated 12 times throughout May and June to capture movement patterns of the manta rays in both space and time.

The goal of the aerial surveys was to collect baseline data on the abundance, distribution and possible migration patterns of manta rays for this section of Florida coastline. Mantas were counted, their direction of travel noted and each was photographed to record the black/white pattern on the animal's back. It may be possible to use these patterns to determine which species of manta ray are present.

Commitment

Georgia Aquarium is committed to advancing the scientific community's understanding of manta rays and to increasing public awareness of this species in order to promote its conservation. These goals are greatly enhanced by having manta rays on display at the Aquarium. Georgia Aquarium's commitment focuses on the education, research, conservation and the future of manta rays.

The IUCN Red List

Every four years, the International Union for the Conservation of Nature or IUCN publishes the **IUCN Red List,** which is an inventory of the current conservation status of plant and animal species worldwide. The Red List is intended to raise awareness of species that are threatened with extinction and promote their conservation.

PADI Manta Specialty - Our Mantas

Nandi

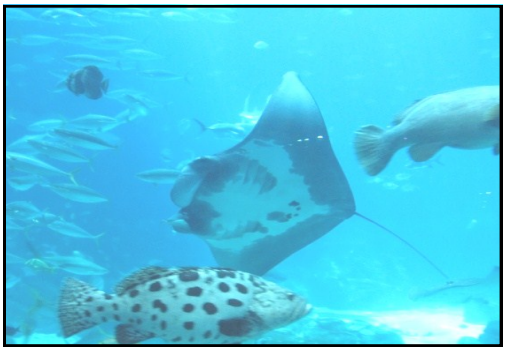
- ~ 12 feet (measured wingtip to wingtip)

ID: Gallery or Tunnel View

- Mostly white belly with grey freckles in center of body between rows of gill slits

ID: Top side

- White "saddle" pattern on her back



Tallulah

- ~12 feet

ID: Gallery or Tunnel View

- Dark black cephalic lobes that blend into black areas around gills
- Black around edge of the belly and wings

ID: Topside

- Dark black back

 # 3

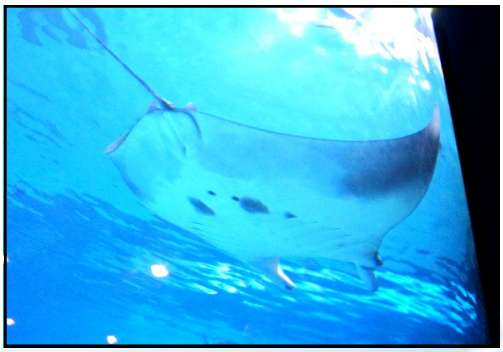
- About 10-12 feet

ID: Gallery or Tunnel View

- Four dark circles that blend into the grey of the belly

ID: Topside

- Dark black back; light marks on leading edge of wings near the tips



Manta #4

- About 10-12 feet

ID: Gallery or Tunnel View

- Only male (look for claspers)
- Two small dark circles behind last gill slits
- White under belly

ID: Topside

- Dark black back

PADI Manta Specialty - Manta Biology

Range/Habitat

- The manta ray occurs in warm temperate and tropical waters in all major oceans and the Mediterranean Sea.
- It is found from the surface to 394 feet (120 m).
- This species is an open ocean swimmer. It is frequently observed around reefs and near oceanic islands, often in small groups when it is in pursuit of food.

Physical Characteristics

- The manta ray has a unique body shape. It has an extremely broad head with an enormous, wide mouth flanked by two broad, flexible, fleshy cephalic lobes. These lobes are kept rolled and pointed forward except when the manta is feeding and they are opened and extended downward to direct a flow of water into the mouth.
- It is the largest of all rays with weights ranging up to three tons (about 3000 kg).
- At birth, the width of its wings is about 4 feet (125 cm), growing to an average width of 13 feet (4 m) as an adult. The maximum known size is about 30 feet (9m).
- The top surface is blackish in color. Its underside is mostly white. Color patterns on the shoulders and underside exhibit wide variations and help researchers to identify individual animals.
- Its tail is whip-like, but short and does not have a barb.

Diet/Feeding

- The manta ray is primarily a plankton feeder, but also consumes small fishes.
- Its two cephalic lobes are unrolled and held at a downward angle to create a funnel guiding prey into its enormous mouth.
- This species feeds alone or in small schools near or at the surface where plankton and schooling fish accumulate. The small prey that enter the mouth are filtered from the water by the gill rakers (filter plates), located on the internal gill arches, and then swallowed.
- During feeding the manta ray repeatedly executes reverse somersaults under water and also occasionally breaks the surface. It also feeds in a horizontal orientation.

PADI Manta Specialty - Manta Biology

Conservation Status

- The manta ray is classified as “Vulnerable” on the IUCN Red List.

Additional Information

- The manta ray has been observed jumping clear of the water, mainly in spring and autumn. This seems to be associated with mating displays, although it may also be social behavior or actions related to dislodging skin parasites.
- This species does not have a stinging spine and is generally harmless to humans.
- The only natural enemies of the manta ray are large sharks and man.
- Fishing pressure and by-catch in drift and set nets are depleting local populations.
- It is harpooned and harvested in some areas for its flavorful meat, skin and oil-rich liver.
- The branchial arches of its gills are dried and used in Asian medicine. This is contributing to additional harvesting.
- This ray is ovoviviparous, meaning that the embryo develops within eggs retained in the mother’s uterus. The embryo is nourished by its egg’s small yolk, but also receives nourishment from the mother through small projections in the uterus called “villi” (trophonemata).
- The female manta gives birth to one or two live young. The pups are born with their wings folded around their body to allow easier passage through the birth canal.
- The manta ray has rows of tiny, peg-like teeth on the front of the lower jaw, but these are not used for feeding. These small teeth are non-functional, in contrast to the grinding plate dentitions present in the related eagle and cownose rays.
- The manta ray also is called the “devil ray” because when rolled and projected forward, the cephalic lobes have the appearance of horns.

PADI Manta Specialty - Conservation

Manta Ray Conservation Status

The manta ray is listed as "Vulnerable" in the IUCN Red List. This means that the species vulnerable to extinction in the wild.

The IUCN describes the known conservation risks to this unique animal as follows:

- Fishing for the manta ray occurs in a few areas and it is not a major component of by-catch in any fishery for other species.
- The manta is the target of fisheries in about some areas of the world: Philippines, Mexico, Mozambique, Pakistan, , Sri Lanka, Tanzania, Ghana and Indonesia.
- It is caught for fins, skin, liver, meat, and branchial filaments (for the Asian medical market).
- Population declines have been observed in the Philippines, Mexico, Sri Lanka-India and Indonesia.
- There is a risk of extinction of local populations of manta rays by overfishing because of the nature of biology of the species:
  - Local populations are small in size
  - There is limited migration between populations
  - Females give birth to one pup (occasionally two)
  - Mantas are slow to reach reproductive maturity.

The IUCN expects that the conservation status of the manta ray will further deteriorate due to increased fishing pressure, pollution and exploitation of coastal environments.

Conservation and the Future

In the long term, our manta ray program can help to better understand the species and work toward its long-term survival in the oceans.

- Marine animal and breeding behaviors are mostly understood through work in zoological facilities.
- Funding and support of research at GAI and our field research programs continue to build on an extensive program.

PADI Manta Specialty - FAQs

1. How was the Aquarium's first manta ray transported to Atlanta?

Georgia Aquarium used the same technology and similar equipment used to transport the whale sharks from Taiwan to Atlanta. Nandi made the 9,000-mile journey on a 747-200 aircraft from Durban, South Africa through Cape Verde to Atlanta. The manta ray was under the care and supervision of Georgia Aquarium and uShaka Marine World professional staff and maintained by a highly advanced marine life support system.

2. How long did the transport take?

The transport took about 30 hours from South Africa to Atlanta.

3. Where did the other manta rays come from?

We acquired them from off the East Coast of Florida

4. What kind of container and life support was used?

Each manta was maintained in a large transport unit that incorporated the sophisticated marine life support system first employed in transporting the whale sharks to Atlanta. The animals were closely monitored by Aquarium specialists while on route.

5. Are there other manta rays found in U.S. aquariums?

Georgia Aquarium is the only aquarium in the U.S. to house manta rays.

6. What other facilities have manta rays on display?

There are a few other facilities to house mantas outside of the U.S. We can't speak for other institutions and their collections, but mantas typically grow to about 13 feet (4 m), and the largest on record was 30 feet (9 m).

8. How long have manta rays been kept in an aquarium environment?

In Japan, manta rays have been managed in aquariums for nearly two decades.

PADI Manta Specialty - FAQs

9. How big will the aquarium's mantas get?

There is no known maximum size for how big manta rays can grow while in an aquarium setting. We expect Nandi could grow to be between 13-20 feet wide.

10. Is Ocean Voyager big enough for the four mantas?

Ocean Voyager is big enough for all of our mantas and the other animals.

11. What do you feed the manta rays?

Our mantas are fed a diet very similar to that of the whale sharks: krill, small fishes and vitamin supplements in the form of a gel.

12. How fast do manta rays grow in an aquarium environment?

Nandi has grown more than three feet since arriving at the Georgia Aquarium in the summer of 2008.

13. At what size do manta rays become sexually mature?

It has been suggested that they need to be more than 13 feet (4 m) in disc width to reproduce, but to date, this part of their life history is not understood.

14. Have manta rays ever reproduced in an aquarium environment?

Yes, manta rays have successfully reproduced and been raised in an aquarium environment.

15. How will the manta rays get along with the whale sharks and other animals?

During the five years Nandi has been in the Ocean Voyager habitat, she has gotten along well with the whale sharks and other animals.

16. Are there more than one species of manta ray?

Yes. Scientists have identified two different species and it is believed that there is at least one more undescribed species: *Manta birostris* is the "true" giant manta (the Aquarium does not have an example of this species), *Manta alfredi* or "Prince Alfred's manta" found in the Indian Ocean (Nandi is this species) and *Manta* sp. *cf birostris.* The undescribed "Atlantic manta" (Tallulah, Manta #3 and Manta #4 belong to this species).

PADI Manta Specialty - FAQs

18. Can manta rays be a danger to divers or swimmers in the immersion program and vice versa?

Manta rays are filter feeders like the whale sharks. Also, they do not have a barb/spine at the base of their tail. They are not a danger to our team or guests. We do not expect the divers or swimmers in Ocean Voyager to impact the manta ray. Additionally, uShaka Marine World, where Nandi lived for about a year, had an immersion program and there were never any issues with either Nandi or the participants having a negative impact on each other.

Manta Ray Photo IDs

The black and white color patterns on the manta's back and underside are unique to each animal. They act as "fingerprints" that researchers use to identify individuals and track their movements. Photo catalogs of mantas worldwide have been assembled to assist in tracking their movements over large areas of ocean. Tracking and photographing of the animals is done from aircraft, as well as from boats and by divers.

PADI Manta Specialty - Three Species

Manta birostris – "true" giant manta ray
None at the Aquarium

Manta alfredi –
Prince Alfred's ray

Manta sp. Undescribed "Atlantic manta"
"Tallulah"-type

New work on the taxonomy of manta rays shows that there are at least three species. The illustrations on the left show how to tell them apart.

Manta birostris has **a bony mass** on the top of the base of the tail, about the size of a large goose egg, with a short spine embedded in it. There are usually white patches on the shoulders that may look like one or two triangles or wedges, but they **do not meet the back of the spiracle**. We do not have any *Manta birostris* at Georgia Aquarium.

Manta alfredi lacks the bony mass on top of the base of the tail. The white shoulder patches form a short hook on the leading edge that meets the back edge of the spiracle in a bright and clear edge. **Nandi is** a *Manta alfredi* manta ray.

***Manta* sp.** is an undescribed species, which means it has not gone through the formal naming process yet. However, it can be distinguished from the other two by its all black coloration on the back, and the presence of the bony mass on the top of the base of the tail. In this way it is more similar to *Manta birostris*, so it is sometimes referred to as *Manta* sp. *cf. birostris*, which is taxonomy-talk for "undescribed, but most like *Manta birostris*."

Tallulah, **#3** and **Manta #4** are of the *Manta* sp. type. This species only occurs in the tropical Atlantic and Caribbean.

There are other differences among the three types than those that are shown here (to do with teeth and spots on the belly), but these are sufficient for the purpose of distinguishing among our mantas.

PADI Manta Specialty - Unanswered Questions

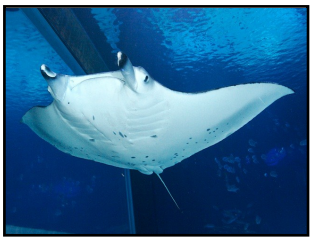
How Many Species of Manta?

A recent publication by Dr. Andrea Marshall and colleagues from the Manta Ray and Whale Shark Research Centre in Mozambique reveals that there are definitely two, and possibly three, species of manta rays in the world ocean. One species, *Manta birostris*, is an oceanic manta and is not among the mantas in Ocean Voyager. Our first manta, "Nandi"' has been identified as the "Alfred manta," *Manta alfredi*.

According to Marshall *et al*., this species can be recognized by a variety of features, including the spotting pattern on the underside of the body. The photo of Nandi shows that there is a small black patch just behind the last (fifth) gill slit on each side of her body and a few small black spots in the center of the body between the gill openings. Also, she has a pattern of spots along the trailing edge of her wings that is characteristic of the Alfred manta.

The Atlantic-Caribbean mantas are an enigma. There is good evidence that they represent a separate species and Dr. Marshall is working to confirm this suspicion. The photos of Tallulah, Manta #3 and Manta #4 show a spotting pattern on their undersides that differs from that on Nandi. Even though each of the three have different patterns, none has spots in the midline of the body between the gill slits. That area is solid white on all three animals. All three have black patches behind the last gill opening, but these are much larger than on Nandi. Lastly, the rear half of the wings on all three are a uniform gray or black, whereas Nandi has numerous spots.

If the Atlantic manta is indeed found to be a distinct species, it will receive a scientific name that was applied to a manta in the literature in the past.



Nandi

Tallulah

No. 3

No. 4

Addendum:

Two sub-adult female whale sharks that arrived in June, 2006

Alice: About 24 feet (7.3 m)

Numerous marks and spots on her white belly

Trixie: About 26 feet (7.9 m)

Pure white belly, few markings

White stripe on front edge of dorsal fin

Two juvenile male whale sharks that arrived in June, 2007

Yushan : About 20 feet (6 m)

U-shaped notch on back edge of dorsal fin

White stripe on front of dorsal fin

Name means "jade mountain"

Claspers between pelvic fins

Taroko: About 20 feet (6 m),

Name means "the magnificent and splendid"

Claspers between pelvic fins

Zebra sharks

Tan colored with small spots

Vertical black stripes when young (hence their name)

Able to lay on the bottom because it has a functional spiracle

Wobbegong sharks (two species)

Despite its appearance it is a "real" shark

Has a functional spiracle , which allows it to lie still

Giant grouper

All are born female and some change gender later in life

Largest of coral-reef dwelling bony fish; can grow to 8 feet (2.4 m) and weigh over 800 lbs. (362 kg).

Green sawfish

Looks like a shark but is a ray (note the gill slits are on its underside)

Bowmouth guitarfish

Is also a ray, despite its appearance

Can grow to 10 feet (3 m) and weigh 300 lbs. (136 kg)

Giant guitarfish

Is also a ray

PADI Continuing Education Administrative Document

LIABILITY RELEASE AND ASSUMPTION OF RISK AGREEMENT

Please read carefully and fill in all blanks before signing.

I, _____ , hereby affirm that I am aware that skin and scuba diving have inherent risks which may result in serious injury or death. I understand that diving with compressed air involves certain inherent risks; including but not limited to decompression sickness, embolism or other hyperbaric/air expansion injury that require treatment in a recompression chamber. I further understand that the open water diving trips which are necessary for training and for certification may be conducted at a site that is remote, either by time or distance or both, from such a recompression chamber. I still choose to proceed with such dives in spite of the possible absence of a recompression chamber in proximity to the dive site.

I understand this Liability Release and Assumption of Risk Agreement (Agreement) hereby encompasses and applies to all diver training activities and courses in which I choose to participate. These activities and courses may include, but are not limited to, altitude, boat, cavern, AWARE, deep, enriched air, photography/videography, diver propulsion vehicle, drift, dry suit, ice, multilevel, night, peak performance buoyancy, search & recovery, rebreather, underwater naturalist, navigator, wreck, adventure diver, rescue diver and other distinctive specialties (hereinafter "Programs").

I understand and agree that neither my instructor(s), divemasters(s),the facility which provides the Programs _____, nor PADI Americas, Inc., nor its affiliate and subsidiary corporations, nor any of their respective employees, officers, agents, contractors or assigns (hereinafter referred to as "Released Parties") may be held liable or responsible in any way for any injury, death or other damages to me, my family, estate, heirs or assigns that may occur as a result of my participation in the Programs or as a result of the negligence of any party, including the Released Parties, whether passive or active.

In consideration of being allowed to participate in the Programs, I hereby personally assume all risks of the Programs, whether foreseen or unforeseen, that may befall me while I am a participant in the Programs including, but not limited to, the academics, confined water and/or open water activities. I further release, exempt and hold harmless said Programs and Released Parties from any claim or lawsuit by me, my family, estate, heirs or assigns, arising out of my enrollment and participation in this program including both claims arising during the program or after I receive my certification(s).

I understand that past or present medical conditions may be contraindicative to my participation in the Programs. I declare that I am in good mental and physical fitness for diving, and that I am not under the influence of alcohol, nor am I under the influence of any drugs that are contraindicated to diving. If I am taking medication, I declare that I have seen a physician and have approval to dive while under the influence of the medication/drugs. I affirm it is my responsibility to inform my instructor of any and all changes to my medical history at any time during my participation in the Programs and agree to accept responsibility for my failure to do so. I also understand that skin diving and scuba diving are physically strenuous activities and that I will be exerting myself during this program, and that if I am injured as a result of heart attack, panic, hyperventilation, drowning or any other cause, that I expressly assume the risk of said injuries and that I will not hold the Released Parties responsible for the same.

I further state that I am of lawful age and legally competent to sign this Liability Release and Assumption of Risk Agreement, or that I have acquired the written consent of my parent or guardian. I understand the terms herein are contractual and not a mere recital, and that I have signed this Agreement of my own free act and with the knowledge that I hereby agree to waive my legal rights. I further agree that if any provision of this Agreement is found to be unenforceable or invalid, that provision shall be severed from this Agreement. The remainder of this Agreement will then be construed as though the unenforceable provision had never been contained herein.

I hereby state and agree this Agreement will be effective for all activities associated with the Programs in which I participate within one year from the date on which I sign this Agreement.

I understand and agree that I am not only giving up my right to sue the Released Parties but also any rights my heirs, assigns, or beneficiaries may have to sue the Released Parties resulting from my death. I further represent I have the authority to do so and that my heirs, assigns, or beneficiaries will be estopped from claiming otherwise because of my representations to the Released Parties.

I, _____ BY THIS INSTRUMENT AGREE TO EXEMPT AND RELEASE MY INSTRUCTORS, DIVEMASTERS, THE FACILITY WHICH OFFERS THE PROGRAMS AND PADI AMERICAS, INC., AND ALL RELATED ENTITIES AND RELEASED PARTIES AS DEFINED ABOVE, FROM ALL LIABILITY OR RESPONSIBILITY WHATSOEVER FOR PERSONAL INJURY, PROPERTY DAMAGE OR WRONGFUL DEATH HOWEVER CAUSED, INCLUDING, BUT NOT LIMITED TO, THE NEGLIGENCE OF THE RELEASED PARTIES, WHETHER PASSIVE OR ACTIVE.

I HAVE FULLY INFORMED MYSELF OF THE CONTENTS OF THIS LIABILITY RELEASE AND ASSUMPTION OF RISK AGREEMENT BY READING IT BEFORE I SIGNED IT ON BEHALF OF MYSELF AND MY HEIRS.

_____ Participant's Signature

_____ Date (Day/Month/Year)

_____ Signature of Parent or Guardian (where applicable)

_____ Date (Day/Month/Year)

MEDICAL STATEMENT – Participant Record, (Confidential Information)

R·S·T·C Recreational Scuba Training Council

Undersea & Hyperbaric Medical Society

Please read carefully before signing.

This is a statement in which you are informed of some potential risks involved in scuba diving and of the conduct required of you during the scuba training program. Your signature on this statement is required for you to participate in the scuba training program.

Read this statement prior to signing it. You must complete this Medical Statement, which includes the medical questionnaire section, to enroll in the scuba training program. In addition, if your medical condition changes at any time during your scuba programs it is important that you inform your instructor immediately. If you are a minor, you must have this Statement signed by a parent or guardian.

Diving is an exciting and demanding activity. When performed correctly, applying correct techniques, it is relatively safe. When established safety procedures are not followed, however, there are increased risks.

To scuba dive safely, you should not be extremely overweight or out of condition. Diving can be strenuous under certain conditions. Your respiratory and circulatory systems must be in good health. All body air spaces must be normal and healthy. A person with coronary disease, a current cold or congestion, epilepsy, a severe medical problem or who is under the influence of alcohol or drugs should not dive. If you have asthma, heart disease, other chronic medical conditions or you are taking medications on a regular basis, you should consult your doctor and the instructor before participating in this program, and on a regular basis thereafter upon completion. You will also learn from the instructor the important safety rules regarding breathing and equalization while scuba diving. Improper use of scuba equipment can result in serious injury. You must be thoroughly instructed in its use under direct supervision of a qualified instructor to use it safely.

If you have any additional questions regarding this Medical Statement or the Medical Questionnaire section, review them with your instructor before signing.

(see reverse)

Divers Medical Questionnaire

To the Participant:

The purpose of this Medical Questionnaire is to find out if you should be examined by your doctor before participating in recreational diver training. A positive response to a question does not necessarily disqualify you from diving. A positive response means that there is a preexisting condition that may affect your safety while diving and you must seek the advice of your physician prior to engaging in dive activities.

Please answer the following questions on your past or present medical history with a YES or NO. If you are not sure, answer YES. If any of these items apply to you, we must request that you consult with a physician prior to participating in scuba diving. Your instructor will supply you with an RSTC Medical Statement and Guidelines for Recreational Scuba Diver's Physical Examination to take to your physician.

_____ Could you be pregnant, or are you attempting to become pregnant?

_____ Are you presently taking prescription medications? (with the exception of birth control or anti-malarial)

_____ Are you over 45 years of age and can answer YES to one or more of the following?

- currently smoke a pipe, cigars or cigarettes
- have a high cholesterol level
- have a family history of heart attack or stroke
- are currently receiving medical care
- high blood pressure
- diabetes mellitus, even if controlled by diet alone

Have you ever had or do you currently have...

_____ Asthma, or wheezing with breathing, or wheezing with exercise?

_____ Frequent or severe attacks of hayfever or allergy?

_____ Frequent colds, sinusitis or bronchitis?

_____ Any form of lung disease?

_____ Pneumothorax (collapsed lung)?

_____ Other chest disease or chest surgery?

_____ Behavioral health, mental or psychological problems (Panic attack, fear of closed or open spaces)?

_____ Epilepsy, seizures, convulsions or take medications to prevent them?

_____ Recurring complicated migraine headaches or take medications to prevent them?

_____ Blackouts or fainting (full/partial loss of consciousness)?

_____ Frequent or severe suffering from motion sickness (seasick, carsick, etc.)?

_____ Dysentery or dehydration requiring medical intervention?

_____ Any dive accidents or decompression sickness?

_____ Inability to perform moderate exercise (example: walk 1.6 km/one mile within 12 mins.)?

_____ Head injury with loss of consciousness in the past five years?

_____ Recurrent back problems?

_____ Back or spinal surgery?

_____ Diabetes?

_____ Back, arm or leg problems following surgery, injury or fracture?

_____ High blood pressure or take medicine to control blood pressure?

_____ Heart disease?

_____ Heart attack?

_____ Angina, heart surgery or blood vessel surgery?

_____ Sinus surgery?

_____ Ear disease or surgery, hearing loss or problems with balance?

_____ Recurrent ear problems?

_____ Bleeding or other blood disorders?

_____ Hernia?

_____ Ulcers or ulcer surgery ?

_____ A colostomy or ileostomy?

_____ Recreational drug use or treatment for, or alcoholism in the past five years?

The information I have provided about my medical history is accurate to the best of my knowledge. I affirm it is my responsibility to inform my instructor of any and all changes to my medical history at any time during my participation in scuba programs. I agree to accept responsibility for omissions regarding my failure to disclose any existing or past health condition, or any changes thereto.

_____ Signature _____ Date

_____ Signature of Parent or Guardian (where applicable) _____ Date

Standard Safe Diving Practices Statement of Understanding

Please read carefully before signing.

This is a statement in which you are informed of the established safe diving practices for skin and scuba diving. These practices have been compiled for your review and acknowledgement and are intended to increase your comfort and safety in diving. Your signature on this statement is required as proof that you are aware of these safe diving practices. Read and discuss the statement prior to signing it. If you are a minor, this form must also be signed by a parent or guardian.

I,_____ Print Name _____, understand that as a diver I should:

1. Maintain good mental and physical fitness for diving. Avoid being under the influence of alcohol or dangerous drugs when diving. Keep proficient in diving skills, striving to increase them through continuing education and reviewing them in controlled conditions after a period of diving inactivity, and refer to my course materials to stay current and refresh myself on important information.
2. Be familiar with my dive sites. If not, obtain a formal diving orientation from a knowledgeable, local source. If diving conditions are worse than those in which I am experienced, postpone diving or select an alternate site with better conditions. Engage only in diving activities consistent with my training and experience. Do not engage in cave or technical diving unless specifically trained to do so.
3. Use complete, well-maintained, reliable equipment with which I am familiar; and inspect it for correct fit and function prior to each dive. Have a buoyancy control device, low-pressure buoyancy control inflation system, submersible pressure gauge and alternate air source and dive planning/monitoring device (dive computer, RDP/dive tables—whichever you are trained to use) when scuba diving. Deny use of my equipment to uncertified divers.
4. Listen carefully to dive briefings and directions and respect the advice of those supervising my diving activities. Recognize that additional training is recommended for participation in specialty diving activities, in other geographic areas and after periods of inactivity that exceed six months.
5. Adhere to the buddy system throughout every dive. Plan dives – including communications, procedures for reuniting in case of separation and emergency procedures – with my buddy.
6. Be proficient in dive planning (dive computer or dive table use). Make all dives no decompression dives and allow a margin of safety. Have a means to monitor depth and time underwater. Limit maximum depth to my level of training and experience. Ascend at a rate of not more than 18 metres/60 feet per minute. Be a SAFE diver – Slowly Ascend From Every dive. Make a safety stop as an added precaution, usually at 5 metres/15 feet for three minutes or longer.
7. Maintain proper buoyancy. Adjust weighting at the surface for neutral buoyancy with no air in my buoyancy control device. Maintain neutral buoyancy while underwater. Be buoyant for surface swimming and resting. Have weights clear for easy removal, and establish buoyancy when in distress while diving. Carry at least one surface signaling device (such as signal tube, whistle, mirror).
8. Breathe properly for diving. Never breath-hold or skip-breathe when breathing compressed air, and avoid excessive hyperventilation when breath-hold diving. Avoid overexertion while in and underwater and dive within my limitations.
9. Use a boat, float or other surface support station, whenever feasible.
10. Know and obey local dive laws and regulations, including fish and game and dive flag laws.I have read the above statements and have had any questions answered to my satisfaction. I understand the importance and purposes of these established practices. I recognize they are for my own safety and well-being, and that failure to adhere to them can place me in jeopardy when diving.

_____ Participant's Signature _____ Date (Day/Month/Year)

_____ Signature of Parent or Guardian (where applicable) _____ Date (Day/Month/Year)

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R·S·T·C
Recreational Scuba Training Council

UNDERSEA & HYPERBARIC MEDICAL SOCIETY

MEDICAL STATEMENT

Participant Record (Confidential Information)

Please read carefully before signing.

This is a statement in which you are informed of some potential risks involved in scuba diving and of the conduct required of you during the scuba training program. Your signature on this statement is required for you to participate in the scuba training program offered

by_____and
Instructor

_____located in the
Facility

city of_____, state/province of _____.

Read this statement prior to signing it. You must complete this Medical Statement, which includes the medical questionnaire section, to enroll in the scuba training program. If you are a minor, you must have this Statement signed by a parent or guardian.

Diving is an exciting and demanding activity. When performed correctly, applying correct techniques, it is relatively safe. When established safety procedures are not followed, however, there are increased risks.

To scuba dive safely, you should not be extremely overweight or out of condition. Diving can be strenuous under certain conditions. Your respiratory and circulatory systems must be in good health. All body air spaces must be normal and healthy. A person with coronary disease, a current cold or congestion, epilepsy, a severe medical problem or who is under the influence of alcohol or drugs should not dive. If you have asthma, heart disease, other chronic medical conditions or you are taking medications on a regular basis, you should consult your doctor and the instructor before participating in this program, and on a regular basis thereafter upon completion. You will also learn from the instructor the important safety rules regarding breathing and equalization while scuba diving. Improper use of scuba equipment can result in serious injury. You must be thoroughly instructed in its use under direct supervision of a qualified instructor to use it safely.

If you have any additional questions regarding this Medical Statement or the Medical Questionnaire section, review them with your instructor before signing.

Divers Medical Questionnaire

To the Participant:

The purpose of this Medical Questionnaire is to find out if you should be examined by your doctor before participating in recreational diver training. A positive response to a question does not necessarily disqualify you from diving. A positive response means that there is a preexisting condition that may affect your safety while diving and you must seek the advice of your physician prior to engaging in dive activities.

_____ Could you be pregnant, or are you attempting to become pregnant?

_____ Are you presently taking prescription medications? (with the exception of birth control or anti-malarial)

_____ Are you over 45 years of age and can answer YES to one or more of the following?
- currently smoke a pipe, cigars or cigarettes
- have a high cholesterol level
- have a family history of heart attack or stroke
- are currently receiving medical care
- high blood pressure
- diabetes mellitus, even if controlled by diet alone

Have you ever had or do you currently have...

_____ Asthma, or wheezing with breathing, or wheezing with exercise?

_____ Frequent or severe attacks of hayfever or allergy?

_____ Frequent colds, sinusitis or bronchitis?

_____ Any form of lung disease?

_____ Pneumothorax (collapsed lung)?

_____ Other chest disease or chest surgery?

_____ Behavioral health, mental or psychological problems (Panic attack, fear of closed or open spaces)?

_____ Epilepsy, seizures, convulsions or take medications to prevent them?

_____ Recurring complicated migraine headaches or take medications to prevent them?

_____ Blackouts or fainting (full/partial loss of consciousness)?

_____ Frequent or severe suffering from motion sickness (seasick, carsick, etc.)?

Please answer the following questions on your past or present medical history with a **YES** or **NO**. If you are not sure, answer **YES**. If any of these items apply to you, we must request that you consult with a physician prior to participating in scuba diving. Your instructor will supply you with an RSTC Medical Statement and Guidelines for Recreational Scuba Diver's Physical Examination to take to your physician.

_____ Dysentery or dehydration requiring medical intervention?

_____ Any dive accidents or decompression sickness?

_____ Inability to perform moderate exercise (example: walk 1.6 km/one mile within 12 mins.)?

_____ Head injury with loss of consciousness in the past five years?

_____ Recurrent back problems?

_____ Back or spinal surgery?

_____ Diabetes?

_____ Back, arm or leg problems following surgery, injury or fracture?

_____ High blood pressure or take medicine to control blood pressure?

_____ Heart disease?

_____ Heart attack?

_____ Angina, heart surgery or blood vessel surgery?

_____ Sinus surgery?

_____ Ear disease or surgery, hearing loss or problems with balance?

_____ Recurrent ear problems?

_____ Bleeding or other blood disorders?

_____ Hernia?

_____ Ulcers or ulcer surgery ?

_____ A colostomy or ileostomy?

_____ Recreational drug use or treatment for, or alcoholism in the past five years?

The information I have provided about my medical history is accurate to the best of my knowledge. ***I agree to accept responsibility for omissions regarding my failure to disclose any existing or past health condition.***

_____ Signature _____ Date _____ Signature of Parent or Guardian _____ Date

STUDENT

Please print legibly.

Name_____ Birth Date _____ Age _____
First Initial Last Day/Month/Year

Mailing Address _____

City_____ State/Province/Region _____

Country _____ Zip/Postal Code _____

Home Phone ( )_____ Business Phone ( )_____

Email _____ FAX_____

Name and address of your family physician

Physician _____ Clinic/Hospital _____

Address_____

Date of last physical examination _____

Name of examiner_____ Clinic/Hospital_____

Address _____

Phone ( )_____ Email _____

Were you ever required to have a physical for diving? ☐ Yes ☐ No If so, when?_____

PHYSICIAN

This person applying for training or is presently certified to engage in scuba (self-contained underwater breathing apparatus) diving. Your opinion of the applicant's medical fitness for scuba diving is requested. There are guidelines attached for your information and reference.

Physician's Impression

☐ I find no medical conditions that I consider incompatible with diving.

☐ I am unable to recommend this individual for diving.

Remarks _____

_____

_____

_____ Date _____
Physician's Signature or Legal Representative of Medical Practitioner Day/Month/Year

Physician_____ Clinic/Hospital_____

Address_____

Phone ( )_____ Email _____

Guidelines for Recreational Scuba Diver's Physical Examination

Instructions to the Physician:

Recreational **SCUBA** (Self-Contained Underwater Breathing Apparatus) can provide recreational divers with an enjoyable sport safer than many other activities. The risk of diving is increased by certain physical conditions, which the relationship to diving may not be readily obvious. Thus, it is important to screen divers for such conditions.

The **RECREATIONAL SCUBA DIVER'S PHYSICAL EXAMINATION** focuses on conditions that may put a diver at increased risk for decompression sickness, pulmonary overinflation syndrome with subsequent arterial gas embolization and other conditions such as loss of consciousness, which could lead to drowning. Additionally, the diver must be able to withstand some degree of cold stress, the physiological effects of immersion and the optical effects of water and have sufficient physical and mental reserves to deal with possible emergencies.

The history, review of systems and physical examination should include as a minimum the points listed below. The list of conditions that might adversely affect the diver is not all-inclusive, but contains the most commonly encountered medical problems. The brief introductions should serve as an alert to the nature of the risk posed by each medical problem.

The potential diver and his or her physician must weigh the pleasures to be had by diving against an increased risk of death or injury due to the individual's medical condition. As with any recreational activity, there are no data for diving enabling the calculation of an accurate mathematical probability of injury. Experience and physiological principles only permit a qualitative assessment of relative risk.

For the purposes of this document, **Severe Risk** implies that an individual is believed to be at substantially elevated risk of decompression sickness, pulmonary or otic barotrauma or altered consciousness with subsequent drowning, compared with the general population. The consultants involved in drafting this document would generally discourage a student with such medical problems from diving. **Relative Risk** refers to a moderate increase in risk, which in some instances may be acceptable. To make a decision as to whether diving is contraindicated for this category of medical problems, physicians must base their judgement on an assessment of the individual patient. Some medical problems which may preclude diving are **temporary** in nature or responsive to treatment, allowing the student to dive safely after they have resolved.

Diagnostic studies and specialty consultations should be obtained as indicated to determine the diver's status. A list of references is included to aid in clarifying issues that arise. Physicians and other medical professionals of the Divers Alert Network (DAN) associated with Duke University Health System are available for consultation by phone +1 919 684 2948 during normal business hours. For emergency calls, 24 hours 7 days a week, call +1 919 684 8111 or +1 919 684 4DAN (collect). Related organizations exist in other parts of the world – DAN Europe in Italy +39 039 605 7858, DAN S.E.A.P. in Australia +61 3 9886 9166 and Divers Emergency Service (DES) in Australia +61 8 8212 9242, DAN Japan +81 33590 6501 and DAN Southern Africa +27 11 242 0380. There are also a number of informative websites offering similar advice.

NEUROLOGICAL

Neurological abnormalities affecting a diver's ability to perform exercise should be assessed according to the degree of compromise. Some diving physicians feel that conditions in which there can be a waxing and waning of neurological symptoms and signs, such as migraine or demyelinating disease, contraindicate diving because an exacerbation or attack of the preexisting disease (e.g.: a migraine with aura) may be difficult to distinguish from neurological decompression sickness. A history of head injury resulting in unconsciousness should be evaluated for risk of seizure.

Relative Risk Conditions

- **Complicated Migraine Headaches whose symptoms or severity impair motor or cognitive function, neurologic manifestations**
- **History of Head Injury with sequelae other than seizure**
- **Herniated Nucleus Pulposus**
- **Intracranial Tumor or Aneurysm**
- **Peripheral Neuropathy**
- **Multiple Sclerosis**
- **Trigeminal Neuralgia**
- **History of spinal cord or brain injury**

Temporary Risk Condition

History of cerebral gas embolism without residual where pulmonary air trapping has been excluded and for which there is a satisfactory explanation and some reason to believe that the probability of recurrence is low.

Severe Risk Conditions

Any abnormalities where there is a significant probability of unconsciousness, hence putting the diver at increased risk of drowning. Divers with spinal cord or brain abnormalities where perfusion is impaired may be at increased risk of decompression sickness.

Some conditions are as follows:

- **History of seizures other than childhood febrile seizures**
- **History of Transient Ischemic Attack (TIA) or Cerebrovascular Accident (CVA)**
- **History of Serious (Central Nervous System, Cerebral or Inner Ear) Decompression Sickness with residual deficits**

CARDIOVASCULAR SYSTEMS

Relative Risk Conditions

The diagnoses listed below potentially render the diver unable to meet the exertional performance requirements likely to be encountered in recreational diving. These conditions may lead the diver to experience cardiac ischemia and its consequences. Formalized stress testing is encouraged if there is any doubt regarding physical performance capability. The suggested minimum criteria for stress testing in such cases is at least 13 METS.* Failure to meet the exercise criteria would be of significant concern. Conditioning and retesting may make later qualification possible. Immersion in water causes a redistribution of blood from the periphery into the central compartment, an effect that is greatest in cold water. The marked increase in cardiac preload during immersion can precipitate pulmonary edema in patients with impaired left ventricular function or significant valvular disease. The effects of immersion can mostly be gauged by an assessment of the diver's performance while swimming on the surface. A large proportion of scuba diving deaths in North America are due to coronary artery disease. Before being approved to scuba dive, individuals older than 40 years are recommended to undergo risk assessment for coronary artery disease. Formal exercise testing may be needed to assess the risk.

* METS is a term used to describe the metabolic cost. The MET at rest is one, two METS is two times the resting level, three METS is three times the resting level, and so on. The resting energy cost (net oxygen requirement) is thus standardized. (Exercise Physiology; Clark, Prentice Hall, 1975.)

Relative Risk Conditions

- **History of Coronary Artery Bypass Grafting (CABG)**
- **Percutaneous Balloon Angioplasty (PCTA) or Coronary Artery Disease (CAD)**
- **History of Myocardial Infarction**
- **Congestive Heart Failure**
- **Hypertension**
- **History of dysrythmias requiring medication for suppression**
- **Valvular Regurgitation**

Pacemakers

The pathologic process that necessitated should be addressed regarding the diver's fitness to dive. In those instances where the problem necessitating pacing does not preclude diving, will the diver be able to meet the performance criteria?

*** NOTE: Pacemakers must be certified by the manufacturer as able to withstand the pressure changes involved in recreational diving.**

Severe Risks

Venous emboli, commonly produced during decompression, may cross major intracardiac right-to-left shunts and enter the cerebral or spinal cord circulations causing neurological decompression illness. Hypertrophic cardiomyopathy and valvular stenosis may lead to the sudden onset of unconsciousness during exercise.

PULMONARY

Any process or lesion that impedes airflow from the lungs places the diver at risk for pulmonary overinflation with alveolar rupture and the possibility of cerebral air embolization. Many interstitial diseases predispose to spontaneous pneumothorax: Asthma (reactive airway disease), Chronic Obstructive Pulmonary Disease (COPD), cystic or cavitating lung diseases may all cause air trapping. The 1996 Undersea and Hyperbaric Medical Society (UHMS) consensus on diving and asthma indicates that for the risk of pulmonary barotrauma and decompression illness to be acceptably low, the asthmatic diver should be asymptomatic and have normal spirometry before and after an exercise test. Inhalation challenge tests (e.g.: using histamine, hypertonic saline or methacholine) are not sufficiently standardized to be interpreted in the context of scuba diving.

A pneumothorax that occurs or reoccurs while diving may be catastrophic. As the diver ascends, air trapped in the cavity expands and could produce a tension pneumothorax.

In addition to the risk of pulmonary barotrauma, respiratory disease due to either structural disorders of the lung or chest wall or neuromuscular disease may impair exercise performance. Structural disorders of the chest or abdominal wall (e.g.: prune belly), or neuromuscular disorders, may impair cough, which could be life threatening if water is aspirated. Respiratory limitation due to disease is compounded by the combined effects of immersion (causing a restrictive deficit) and the increase in gas density, which increases in proportion to the ambient pressure (causing increased airway resistance). Formal exercise testing may be helpful.

Relative Risk Conditions

- **History of Asthma or Reactive Airway Disease (RAD)***
- **History of Exercise Induced Bronchospasm (EIB)***
- **History of solid, cystic or cavitating lesion***
- **Pneumothorax secondary to:**
  - **-Thoracic Surgery**
  - **-Trauma or Pleural Penetration***
  - **-Previous Overinflation Injury***
- **Obesity**
- **History of Immersion Pulmonary Edema Restrictive Disease***
- **Interstitial lung disease: May increase the risk of pneumothorax**

* Spirometry should be normal before and after exercise

Active Reactive Airway Disease, Active Asthma, Exercise Induced Bronchospasm, Chronic Obstructive Pulmonary Disease or history of same with abnormal PFTs or a positive exercise challenge are concerns for diving.

Severe Risk Conditions

- **History of spontaneous pneumothorax.** Individuals who have experienced spontaneous pneumothorax should avoid diving, even after a surgical procedure designed to prevent recurrence (such as pleurodesis). Surgical procedures either do not correct the underlying lung abnormality (e.g.: pleurodesis, apical pleurectomy) or may not totally correct it (e.g.: resection of blebs or bullae).
- **Impaired exercise performance due to respiratory disease.**

GASTROINTESTINAL

Temporary Risks

As with other organ systems and disease states, a process which chronically debilitates the diver may impair exercise performance. Additionally, dive activities may take place in areas remote from medical care. The possibility of acute recurrences of disability or lethal symptoms must be considered.

Temporary Risk Conditions

- **Peptic Ulcer Disease associated with pyloric obstruction or severe reflux**
- **Unrepaired hernias of the abdominal wall large enough to contain bowel within the hernia sac could incarcerate.**

Relative Risk Conditions

- **Inflammatory Bowel Disease**
- **Functional Bowel Disorders**

Severe Risks

Altered anatomical relationships secondary to surgery or malformations that lead to gas trapping may cause serious problems. Gas trapped in a hollow viscous expands as the divers surfaces and can lead to rupture or, in the case of the upper GI tract, emesis. Emesis underwater may lead to drowning.

Severe Risk Conditions

- **Gastric outlet obstruction of a degree sufficient to produce recurrent vomiting**
- **Chronic or recurrent small bowel obstruction**
- **Severe gastroesophageal reflux**
- **Achalasia**
- **Paraesophageal Hernia**

ORTHOPAEDIC

Relative impairment of mobility, particularly in a boat or ashore with equipment weighing up to 18 kgs/40 pounds must be assessed. Orthopaedic conditions of a degree sufficient to impair exercise performance may increase the risk.

Relative Risk Conditions

- **Amputation**
- **Scoliosis must also assess impact on respiratory function and exercise performance.**
- **Aseptic Necrosis possible risk of progression due to effects of decompression (evaluate the underlying medical**

cause of decompression may accelerate/escalate the progression).

Temporary Risk Conditions

- **Back pain**

HEMATOLOGICAL

Abnormalities resulting in altered rheological properties may theoretically increase the risk of decompression sickness. Bleeding disorders could worsen the effects of otic or sinus barotrauma, and exacerbate the injury associated with inner ear or spinal cord decompression sickness. Spontaneous bleeding into the joints (e.g.: in hemophilia) may be difficult to distinguish from decompression illness.

Relative Risk Conditions

- **Sickle Cell Disease**
- **Polycythemia Vera**
- **Leukemia**
- **Hemophilia/Impaired Coagulation**

METABOLIC AND ENDOCRINOLOGICAL

With the exception of diabetes mellitus, states of altered hormonal or metabolic function should be assessed according to their impact on the individual's ability to tolerate the moderate exercise requirement and environmental stress of sport diving. Obesity may predispose the individual to decompression sickness, can impair exercise tolerance and is a risk factor for coronary artery disease.

Relative Risk Conditions

- **Hormonal Excess or Deficiency**
- **Obesity**
- **Renal Insufficiency**

Severe Risk Conditions

The potentially rapid change in level of consciousness associated with hypoglycemia in diabetics on insulin therapy or certain oral hypoglycemic medications can result in drowning. Diving is therefore generally contraindicated, unless associated with a specialized program that addresses these issues. [See "Guidelines for Recreational Diving with Diabetes" at www/wrstc.com and www.diversalertnetwork.org.]

Pregnancy: The effect of venous emboli formed during decompression on the fetus has not been thoroughly investigated. Diving is therefore not recommended during any stage of pregnancy or for women actively seeking to become pregnant.

BEHAVIORAL HEALTH

Behavioral: The diver's mental capacity and emotional make-up are important to safe diving. The student diver must have sufficient learning abilities to grasp information presented to him by his instructors, be able to safely plan and execute his own dives and react to changes around him in the underwater environment. The student's motivation to learn and his ability to deal with potentially dangerous situations are also crucial to safe scuba diving.

Relative Risk Conditions

- **Developmental delay**
- **History of drug or alcohol abuse**
- **History of previous psychotic episodes**
- **Use of psychotropic medications**

Severe Risk Conditions

- **Inappropriate motivation to dive – solely to please spouse, partner or family member, to prove oneself in the face of personal fears**
- **Claustrophobia and agoraphobia**
- **Active psychosis**
- **History of untreated panic disorder**
- **Drug or alcohol abuse**

OTOLARYNGOLOGICAL

Equalisation of pressure must take place during ascent and descent between ambient water pressure and the external auditory canal, middle ear and paranasal sinuses. Failure of this to occur results at least in pain and in the worst case rupture of the occluded space with disabling and possible lethal consequences.

The inner ear is fluid filled and therefore noncompressible. The flexible interfaces between the middle and inner ear, the round and oval windows are, however, subject to pressure changes. Previously ruptured but healed round or oval window membranes are at increased risk of rupture due to failure to equalise pressure or due to marked overpressurisation during vigorous or explosive Valsalva manoeuvres.

The larynx and pharynx must be free of an obstruction to airflow. The laryngeal and epiglotic structure must function normally to prevent aspiration.

Mandibular and maxillary function must be capable of allowing the patient to hold a scuba mouthpiece. Individuals who have had mid-face fractures may be prone to barotrauma and rupture of the air filled cavities involved.

Relative Risk Conditions

- **Recurrent otitis externa**
- **Significant obstruction of external auditory canal**
- **History of significant cold injury to pinna**
- **Eustachian tube dysfunction**
- **Recurrent otitis media or sinusitis**
- **History of TM perforation**
- **History of tympanoplasty**
- **History of mastoidectomy**
- **Significant conductive or sensorineural hearing impairment**
- **Facial nerve paralysis not associated with barotrauma**
- **Full prosthedontic devices**
- **History of mid-face fracture**
- **Unhealed oral surgery sites**
- **History of head and/or neck therapeutic radiation**
- **History of temperomandibular joint dysfunction**
- **History of round window rupture**

Severe Risk Conditions

- **Monomeric TM**
- **Open TM perforation**
- **Tube myringotomy**
- **History of stapedectomy**
- **History of ossicular chain surgery**
- **History of inner ear surgery**
- **Facial nerve paralysis secondary to barotrauma**
- **Inner ear disease other than presbycusis**
- **Uncorrected upper airway obstruction**
- **Laryngectomy or status post partial laryngectomy**
- **Tracheostomy**
- **Uncorrected laryngocele**
- **History of vestibular decompression sickness**

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11. Divers Alert Network (DAN) United States, 6 West Colony Place, Durham, NC www.DiversAlertNetwork.org
12. Divers Alert Network Europe, P.O. Box 64026 Roseto, Italy, telephone non-emergency line: weekdays office hours +39-085-893-0333, emergency line 24 hours: +39-039-605-7858
13. Divers Alert Network S.E.A.P., P. O. Box 384, Ashburton, Australia, telephone 61-3-9886-9166
14. Divers Emergency Service, Australia, www.rah.sa.gov.au/hyperbaric, telephone 61-8-8212-9242
15. South Pacific Underwater Medicine Society (SPUMS), P.O. Box 190, Red Hill South, Victoria, Australia, www.spums.org.au
16. European Underwater and Baromedical Society, www.eubs.org

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STANDARD SAFE DIVING PRACTICES STATEMENT OF UNDERSTANDING

Please read carefully before signing.

This is a statement in which you are informed of the established safe diving practices for skin and scuba diving. These practices have been compiled for your review and acknowledgement and are intended to increase your comfort and safety in diving. Your signature on this statement is required as proof that you are aware of these safe diving practices. Read and discuss the statement prior to signing it. If you are a minor, this form must also be signed by a parent or guardian.

I, _____ , understand that as a diver I should:
(Print Name)

1. Maintain good mental and physical fitness for diving. Avoid being under the influence of alcohol or dangerous drugs when diving. Keep proficient in diving skills, striving to increase them through continuing education and reviewing them in controlled conditions after a period of diving inactivity, and refer to my course materials to stay current and refresh myself on important information.

2. Be familiar with my dive sites. If not, obtain a formal diving orientation from a knowledgeable, local source. If diving conditions are worse than those in which I am experienced, postpone diving or select an alternate site with better conditions. Engage only in diving activities consistent with my training and experience. Do not engage in cave or technical diving unless specifically trained to do so.

3. Use complete, well-maintained, reliable equipment with which I am familiar; and inspect it for correct fit and function prior to each dive. Have a buoyancy control device, low-pressure buoyancy control inflation system, submersible pressure gauge and alternate air source and dive planning/monitoring device (dive computer, RDP/dive tables—whichever you are trained to use) when scuba diving. Deny use of my equipment to uncertified divers.

4. Listen carefully to dive briefings and directions and respect the advice of those supervising my diving activities. Recognize that additional training is recommended for participation in specialty diving activities, in other geographic areas and after periods of inactivity that exceed six months.

5. Adhere to the buddy system throughout every dive. Plan dives – including communications, procedures for reuniting in case of separation and emergency procedures – with my buddy.

6. Be proficient in dive planning (dive computer or dive table use). Make all dives no decompression dives and allow a margin of safety. Have a means to monitor depth and time underwater. Limit maximum depth to my level of training and experience. Ascend at a rate of not more than 18 metres/60 feet per minute. Be a SAFE diver – **S**lowly **A**scend **F**rom **E**very dive. Make a safety stop as an added precaution, usually at 5 metres/15 feet for three minutes or longer.

7. Maintain proper buoyancy. Adjust weighting at the surface for neutral buoyancy with no air in my buoyancy control device. Maintain neutral buoyancy while underwater. Be buoyant for surface swimming and resting. Have weights clear for easy removal, and establish buoyancy when in distress while diving. Carry at least one surface signaling device (such as signal tube, whistle, mirror).

8. Breathe properly for diving. Never breath-hold or skip-breathe when breathing compressed air, and avoid excessive hyperventilation when breath-hold diving. Avoid overexertion while in and underwater and dive within my limitations.

9. Use a boat, float or other surface support station, whenever feasible.

10. Know and obey local dive laws and regulations, including fish and game and dive flag laws.

I have read the above statements and have had any questions answered to my satisfaction. I understand the importance and purposes of these established practices. I recognize they are for my own safety and well-being, and that failure to adhere to them can place me in jeopardy when diving.

_____ Participant's Signature

_____ Date (Day/Month/Year)

_____ Signature of Parent or Guardian (where applicable)

_____ Date (Day/Month/Year)