

Learning Series - #32



Understanding Underwater sports: Scuba Diving

Self Contained Underwater Breathing Apparatus (SCUBA) diving, a water sport that involves breathing air from a tank while underwater, has witnessed an extraordinary surge in popularity in recent years signaling a new era of underwater exploration filled with adventure and discovery. Technological progress and a dedication to safety has transformed diving, making it easier and more enjoyable for enthusiasts of all ages and experience levels. Nevertheless, as with any activity, it is also important to acknowledge the unique risks associated with Scuba diving.

Most scuba divers are recreational divers who explore rivers, lakes, and coral reefs. A growing number are also exploring caves, ancient ruins, and sunken ships. Additionally, there are individuals who dive professionally, such as public safety divers, marine biologists, military, and various other professions.

Training and Certification

International Organization for Standardization (ISO): Scuba diving certification levels are standardized by ISO ensures equivalency across various scuba organizations and their training programs.



Certification Level	ISO Standard	Description
Introductory Programs	ISO 11121	Does not qualify a person to dive on their own; introduction to scuba experience.
Diver Level 1	ISO 24801-1	Supervised Diver; divers must be accompanied by a diving professional.
Diver Level 2	ISO 24801-2	Autonomous Diver, also known as Open Water Diver.
Diver Level 3	ISO 24801-3	Dive Leader; highest recreational diver training level before professional training.
Enriched Air Nitrox	ISO 11107	Diver Training for using enriched air nitrox (EAN) diving.

Professional Association of Diving Instructors (PADI): Recreational diving certification which is globally renowned as the foremost dive training organization. Their instructors undergo comprehensive standardized training to ensure that scuba certification experience is enjoyable and safe.

Certification Level	Description	Maximum Depth (Adults)	Additional Requirements
PADI Discover Scuba Diver	Introduction to basic scuba diving skills; must be accompanied by a professional diver.	12m/40ft	None
Open Water Diver	Certified to dive independently	18m/60ft	Completion of a certification course, typically including classroom sessions, pool sessions, and open water dives.
Advanced Open Water Diver	Refinement of navigational skills and certified to deep dive	30m/100ft	Completion of the Open Water Diver course or equivalent; typically involves completing five specialty dives.
Rescue Diver	Development of rescue skills, preventing problems, and dealing with emergencies.	Varies	Completion of the Advanced Open Water Diver certification or equivalent; typically includes CPR and first aid training.
Master Scuba Diver	Elite group; earned 5 specialty diver certificates (Deep, Night, Wreck, Cave, Ice, Enriched Air (Nitrox)), minimum 50 dives.	Varies	Completion of the Rescue Diver certification or equivalent; typically requires additional training and experience.



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Professional Scuba Diving Certification Levels

Certification Level	Description
Divemaster	Allows one to work in the diving industry, becoming a group guide.
Assistant Instructor	Gives theoretical classes and evaluates performance in surface exercises.
Open Water Scuba Instructor	Allows one to certify others as Open Water Divers.
Master Scuba Diver Trainer	Has certified 25 divers or more and completed a Specialty Instructor course.
IDC Staff Instructor	Imparts theory and practice under the supervision of a Course Director.
Master Scuba Instructor	Has issued 150 certifications, taught 10 courses of Emergency First Response, and participated in 3 PADI seminars.
Course Director	Professionals who teach PADI Instructor Development Courses (IDCs).



Basic Dive Equipment, functions, and limitations

Functions	Equipment	Limitations
See and move underwater	Mask, snorkel, and fins	<ul style="list-style-type: none"> Limited vision Fogging No communication
Breathing underwater	SCUBA: <ul style="list-style-type: none"> Cylinder with high-pressure breathing gas Buoyancy Control Device (BCD) Regulators 	<ul style="list-style-type: none"> Depth limits based on design Risk of air supply interruption Maintenance needs
Safety instruments	<ul style="list-style-type: none"> Submersible pressure gauge (SPG) Dive computer: <ul style="list-style-type: none"> Measures depth, dive time Provides planning tools, temperature, compass, and air monitoring 	<ul style="list-style-type: none"> Reliance on battery power Potential for malfunction or inaccuracy
Buoyancy and Weighting	<ul style="list-style-type: none"> Weights: <ul style="list-style-type: none"> Weight belt or integrated weight system BCD: <ul style="list-style-type: none"> Helps divers maintain neutral buoyancy at various depths 	<ul style="list-style-type: none"> Low lift Risk of over or under-inflation Difficulty in use
Exposure Protection	<ul style="list-style-type: none"> Wetsuit or drysuit <ul style="list-style-type: none"> Essential for skin protection and keeping warm 	<ul style="list-style-type: none"> Risk of overheating in warm water Limited insulation in extremely cold conditions

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Inherent Risks Associated with Scuba Diving

Risk	Description
Decompression Sickness (DCS) or "The Bends"	Rapid ascent from high-pressure environments can cause nitrogen bubbles to form in the blood and tissues, resulting in symptoms like joint pain, dizziness, and fatigue. DCS can lead to blockages with potentially fatal consequences.
Lung Over Expansion Injuries	Ascending while holding a full breath can cause air in the lungs to expand, leading to injuries such as pneumothorax (collapsed lung), Mediastinal Emphysema (trapped air between chest and lungs), Subcutaneous Emphysema (trapped air under the skin), and Arterial Gas Embolism (air bubbles blocking blood flow, potentially fatal).
Oxygen Toxicity	Exposure to high levels of oxygen can result in symptoms like tunnel vision, twitching, nausea, seizures, or loss of consciousness.
Gas Narcosis	Deep dives beyond 25m can cause narcotic effects due to absorbed gases, similar to being intoxicated. This can impair judgment, lead to overconfidence, and affect motor skills, posing risks during the dive. The symptoms are quickly reversible on ascent.
Drowning	Panic, loss of consciousness, or running out of air underwater are common causes of fatal drowning accidents among divers.
Equipment Malfunction	Equipment failure, such as inaccurate pressure gauges or regulator malfunctions, can lead to panic and fatal consequences if divers are unable to manage the situation effectively.
Ear Barotrauma	Pressure imbalances during descent can cause extreme pain, potentially resulting in a perforated eardrum and loss of hearing if not equalized properly.

Mitigating Scuba Diving risks

- 1. Training and Certification:** ensuring all divers are trained and certified by recognized agencies.
- 2. Safety Briefings:** educating divers about potential risks and safety protocols pre-dive.
- 3. Equipment Maintenance:** ensuring reliability and functionality with regular inspections and maintenance of diving equipment; prolonging equipment lifespan and preventing costly repairs.
- 4. Buddy System:** encouraging the use of the buddy system to assist each other in case of emergencies.
- 5. Dive Planning:** considering factors such as depth, duration, and conditions to minimize risks.
- 6. Adherence to Dive Tables or Computers:** using dive computers or tables to manage ascent rates and times to prevent decompression sickness.
- 7. Monitoring Weather conditions:** being aware of weather forecasts and avoiding diving in adverse conditions.
- 8. Emergency Preparedness:** being prepared to respond to emergencies such as equipment failure, diver separation or medical issues.
- 9. Physical Fitness:** ensuring physically and medically able to handle the demands of diving.
- 10. Continuing Education:** improving skills and knowledge of safe diving practices.





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Underwriting Consideration

Impaired judgement is the biggest danger in Scuba Diving. Alcohol and drug use in any amount may have unpredictable effects at depth and should be strictly avoided. Overconfidence can lead to mistakes.

Health and Lifestyle: Certain pre-existing health factors and lifestyles may affect a diver's risk. Due to the physical demands of diving, individuals should have reasonable aerobic capacity and should not be limited by heart or lung disorders. Medical conditions and lifestyle may affect consciousness, alertness, or judgment.

Health factors that could impact a diver's risk:

- 1) Alcohol or drug misuse
- 2) Diabetes, treated with insulin (may cause low blood sugar levels – hypoglycemia)
- 3) Heart disorders: CAD, irregular heart rhythms, valve disorders, congenital heart defects
- 4) Lung problems, such as severe asthma, COPD, previous pneumothorax
- 5) Seizures, epilepsy
- 6) Fainting spells
- 7) Chronic congestion of the nose and sinuses
- 8) Gastroesophageal reflux, if severe
- 9) Inguinal hernia, not repaired
- 10) Panic disorder, impulsive behavior
- 11) Ruptured eardrum

Lifestyle factors that could impact a diver's risk:

- 1) **Smoking:** increased risk of respiratory issues which could be exacerbated by the compressed air used in scuba tanks.
- 2) **Alcohol and Drug Use:** increased risk of accidents due to impaired judgment, coordination, and reaction times.
- 3) **Poor Physical Fitness:** increased risk of exhaustion or injury.
- 4) **High Stress:** increased risk of impaired decision-making and concentration.
- 5) **Medication:** increased risk of impaired judgment, and unpredictable side effects at depth.
- 6) **Adverse Driving History:** increased risk of impulsive and risky behavior.
- 7) **Extreme activity seeker:** increased risk-taking behavior leading to overestimation of abilities.

Frequency and Depth of Dives

The frequency and depth of dives have an impact on life insurance considerations for scuba divers. An individual who does not dive often is less experienced and therefore a higher risk. Although a higher frequency of dives often indicates that a diver is more experienced, it also increases the likelihood of exposure to diving-related injuries and accidents. Generally, risk assessment will be based upon the depth category most frequently attained by the diver combined with the level of certification and years of experience.

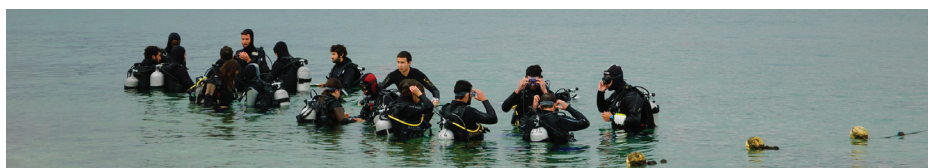


Specialty Diving

Specialty diving poses additional risks compared to standard recreational dives.

- 1) **Deep dives** (typically beyond 30 meters): increases the risk of nitrogen narcosis, decompression sickness, and oxygen toxicity.
- 2) **Wreck Dives:** presents hazards such as entanglement, sharp objects, and limited visibility.
- 3) **Cave Dives/Ice Dives:** poses risks such as disorientation, entrapment, and limited access to the surface.
- 4) **Night Dives:** presents challenges such as limited visibility and disorientation.

Underwriting scuba diving for life insurance involves recognizing the diver's experience and certification level, noting depth and types of dives, reviewing adherence to safety protocols, and assessing medical and lifestyle history to determine insurability. This approach ensures that potential risks are thoroughly evaluated before making underwriting decisions.



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