



Rodale's 16 Tips of Saving Air - By Jon Hardy

Tired of being embarrassed because you're first to run low on air? These 16 tips are likely to save you 500 to 1,000 psi on your next dive.

It's so typically human-our most powerful fear when diving isn't killer sea life or life-altering bends, shallow-water blackout or bone-crushing pressure. Our deepest, most constant fear is, quite simply, embarrassment.

In a skills-intensive sport, we dread the inevitable scrutiny of others because it may find us lacking. Although diving isn't a contest, we too often find a way to make it so, especially when it comes to experience and skills.

One of the most visible signs of our overall diving skill is air consumption, which reflects our mastery of such basic techniques as relaxation, buoyancy control and fin propulsion. It's hard to hide the need to surface because you're running low on air, especially when your buddies or even an entire group must cut short their dive because of you. No one wants to be the first to give the thumbs-up. And then there's the inevitable post-dive braggadocio: "Yeah, I surfaced with 1,000 psi in my tank. What about you?" Well, you surfaced with 250 psi, hoping like heck the divemaster wouldn't notice. Your buddy-your wife-had 1,200. And, quite frankly, you're sick of always having to worry if you can complete a dive without having to borrow her octopus.

But before you go buy doubles or, worse, hang up your fins, here's some good news: Your rate of air consumption is not genetically encoded. Efficient breathing under water is a skill. Granted, it is the most significant adaptive skill we learn for scuba diving. But it is still a skill and can be improved upon. Here's how to save air on your next dive. The predicted air savings for each technique are estimated for a middle-aged male diver with average fitness, diving in warm-water conditions and breathing normally at 66 feet while using a standard aluminum 80-cubic-foot tank. Under these conditions, a tank would normally last about 20 minutes. These techniques should add five to 17 minutes. Of course, if you're already doing some of these things, your increase in bottom time will not be as great.

Tip 1: Alter Your Breathing Cycle

The natural breathing cycle on land is: inhale-exhale-pause-inhale-exhale-pause. However, for a relaxed diver under water, this cycle naturally changes to: inhale-pause-exhale-inhale-pause-exhale. The greatest difference between a novice and experienced diver is the length of this pause and the degree of relaxation. The longer the pause, without causing distress, the less air is consumed. By being relaxed, the diver does not risk lung over-pressurization during this pause, even if a decrease in depth occurs, because the human body is a naturally venting system.

Tip 2: Breathe Deep

You heard it in your first open-water class: Breathe in a slow, deep, relaxed manner. Here's why: Due to the limits of the human body and of regulators when moving denser gases (as in air under pressure), your rate of breathing must be slowed down or you will move air without giving your body adequate opportunity to absorb oxygen. Deep breaths promote a more complete exchange of oxygen and carbon dioxide during the restrictive breathing conditions caused by increased pressure. The greater your depth, the slower and deeper your breathing should be to allow for an adequate exchange.

Tip 3: Mimic a Mime

Remember, water is 800 times denser than air. You simply cannot move as often or as quickly under water without paying a substantial penalty in effort and therefore air consumption. Your goal under water should be to become a relaxed, weightless piece of flotsam that moves as little as possible. When you do move, it should be like a slow-motion mime: oh . . . so . . . easy . . . and . . . deliberate. Divers who practice yoga or other relaxation techniques will have even lower breathing rates.



Tip 4: Keep Your Hands to Yourself

Do not use your hands to swim. Let your arms and hands float loosely at your sides, fold them loosely across your chest, tuck them in your weight belt or beneath your tank on your back. When you kick, do it slowly and deliberately, without the rapid pumping of a cyclist climbing a hill. To achieve this state of weightless relaxation, you must first achieve neutral buoyancy, one of the most important skills when it comes to reducing air consumption.

Tip 5: Become Neutrally Bouyant

You'll know it when you get it: a sense of weightless ease, of being perfectly buoyed by the water around you. Absolute stillness. Perfect suspension. It is one of the most sublime feelings in the world and essential to efficient movement.

Today's neutral buoyancy test is this: use the smallest amount of weight that will allow you to perform a safety hang at 10 to 15 feet, with a tank containing 500 psi, and little or no air in your BC. The idea is to be neutrally buoyant at any depth so that you can fine-tune your buoyancy with your lungs.

Tip 6: Stay Horizontal

Through proper weighting and use of your BC, you are now neutrally buoyant and can move in the most efficient manner under water-horizontally. To save air, keep your body parallel, as much as possible, to the direction of movement. Swimming at an angle to the direction of movement, combined with random movements, is the greatest waste of energy and air by novice divers.

Tip 7: Streamline Your Gear

To streamline your gear, secure all hoses as close to your body as possible. Use the smallest possible tank. Don't wear a snorkel if you don't plan to use it. Wear the smallest, lowest-lift BC that is still adequate for your diving (12 to 24 pounds of buoyant lift for most tropical diving). Put gear such as slates in BC pockets. Get rid of all weight except what you need in order to perform a safety stop at 10 to 15 feet with 500 psi in your tank. Reduce the number of hoses by using an alternate inflation regulator and a hoseless dive computer. Keep your hands free and carry only the gear you need.

Each of these steps reduces drag as you move through the water, therefore reducing the energy you put out and the amount of air you use.

Tip 8: Regulate Your Regulator

Use the highest performance regulator you can afford and are comfortable with, as breathing is the second biggest part of your workload. Wash your regulator properly and have it serviced and adjusted regularly—at least once a year, more if you dive frequently, and after a regulator has been sitting idle for an extended period. Set any diver-controlled adjustment to the easiest breathing position that doesn't free flow.

Tip 9: Conserve Tank Air

When appropriate, swim on the surface using a snorkel, or on your back with the BC partly inflated. Keep in mind that you are not as efficient on the surface as under water, but the air is free. Also, diving shallower when possible will use less air. Avoiding unnecessary trips to the surface to check position will also provide more air for underwater activities.

Tip 10: Stop Spilling Air

Air used to equalize pressure, clear your mask, control buoyancy or adjust a dry suit is necessary, while leaks and free flows are simply a waste. When your primary regulator is out of your mouth, de-tune it (if it has an adjustment) and turn the mouthpiece down to avoid free flows that not only waste air, but are also embarrassing. Scuba air systems have many O-rings that can leak, but the amount of air lost here is minimal. On the other hand, a poorly maintained regulator that leaks air through the mouthpiece can waste a good deal of air. Again, have your regulator serviced and adjusted regularly.

Alternate air sources can needlessly waste air when not in use. If your octopus has an adjustment, de-tune it and secure it in a position so the mouthpiece will not face up.



A few divers still hold the misconception that using the oral inflator under water saves air. The power inflator is far more efficient, but on the surface you will save tank air by orally inflating, if it is safe and comfortable to do so.

Tip 11: Reduce Workload

Swim as little as possible as this is the greatest part of your underwater workload. Ride with currents, use buoyancy control for ups and downs instead of kicking, use anchor lines to pull yourself gently along instead of kicking, and "tiptoe" on fingers when appropriate for the environment.

Tip 12: Stay Warm

It's a fact: Warm divers use less air. Sure, it's great to dive in just a bathing suit, feeling the tropical water against your skin. So free and easy, almost lead-free because you aren't wearing rubber. But what's the price in terms of fatigue and therefore air consumption? A major contributor to fatigue when diving is loss of body heat. This loss goes on even in the warmest tropical waters, 80F to 85F, which is still considerably below your body's core temperature. And remember, water removes heat from your body 25 times faster than air.

To save air, start by increasing thermal protection of the torso, particularly in the armpits and crotch. Next, give better protection to head, feet and hands. Increase the thickness and area of coverage of your wetsuit or change to a custom-made suit. For the ultimate in thermal protection, it is best to use a dry suit with appropriate undergarments.

Tip 13: Increase Fitness

So easy to say, so tough to do. Yet the higher your level of fitness, the better your body can utilize the oxygen in the air you breathe. In the long term, you need to eat well, rest well, reduce stress and get plenty of exercise, while avoiding bad habits, particularly smoking. Just before diving, eat easy-to-digest, nutritious meals, drink lots of fluids (non-alcoholic) and get the best possible rest, all of which will help your overall diving and air consumption.

Tip 14: Increase Experience and Training

Diving itself improves diving. The more you dive, the more comfortable and efficient you will be. Additional diving courses provide even more experience under supervision, along with increased understanding of how best to dive. Related swimming and lifesaving courses improve fitness and skills, while boating and marine science courses improve understanding. Being a more fit, skillful and knowledgeable diver will improve your performance, comfort, safety and enjoyment, while at the same time decreasing your air consumption.

Tip 15: Use your Fins Efficiently

Past Scuba lab tests have clearly shown that no one fin is right for all divers. Your experience, fitness and skill as a diver in using fins will outweigh the inherent performance qualities of the fins themselves. Yet all divers can benefit by adhering to these principles:

- Swimming at a slow, relaxed and steady pace is most efficient.
- Staying as horizontal as possible as you move through the water improves performance.
- Kicking from your hips with your legs as straight as possible is most efficient.
- Fins do not have to be stiff or large to be efficient for you; fins used in the tropics are often more flexible and smaller.
- Fins should fit you comfortably and not be so stiff as to put undue stress on your legs.

Tip 16: It's Not a Contest

People vary in physical size, lung capacity, metabolism, gender (women generally use less air than men), ability to relax and state of fitness. So there is a point past which you cannot improve your air consumption. A large pro football player will never have the same air consumption as a small woman who is a regular swimmer.

Trying to be something you are not, or using techniques that are unsound, simply lead to frustration and increase the risks of diving. So the most important tip: Relax, recreational diving is not a contest.