

MANAGEMENT



RAID™ 

DYNAMIC APNEA SPECIALTY

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INTRODUCTION

Welcome to the RAID Dynamic Apnea Specialty, part of the Freediving Program. Dynamic apnea is a discipline of freediving, typically performed in a pool. It is a great way to train your mammalian dive response, learn relaxation techniques and mental focus, and to improve your finning technique to help you in depth disciplines.

Practicing your finning techniques for freediving in the pool is a good way to identify and iron out any problems you might be having. It is useful to have access to a pool at least 25m long, with a consistent depth of 2m. A consistent depth enables you to fix your buoyancy and then concentrate on technique without having to adjust for a deep and a shallow end. However, it is helpful to prepare for a dynamic swim in a position where you are vertical, or semi-vertical in the water. In these cases, you might need a temporary structure, such as a plastic table, on the bottom of the pool that you can stand on. This should be removed after you have started your swim.

During this course, you will learn how to perform dynamic apnea safely and confidently, discover new techniques for both relaxation and mental focus, and learn techniques to practice and improve your performance. You will also learn how to buddy correctly and safely for dynamic apnea, including how to rescue your buddy in the unlikely event they have a hypoxic episode.

WHAT IS DYNAMIC APNEA?

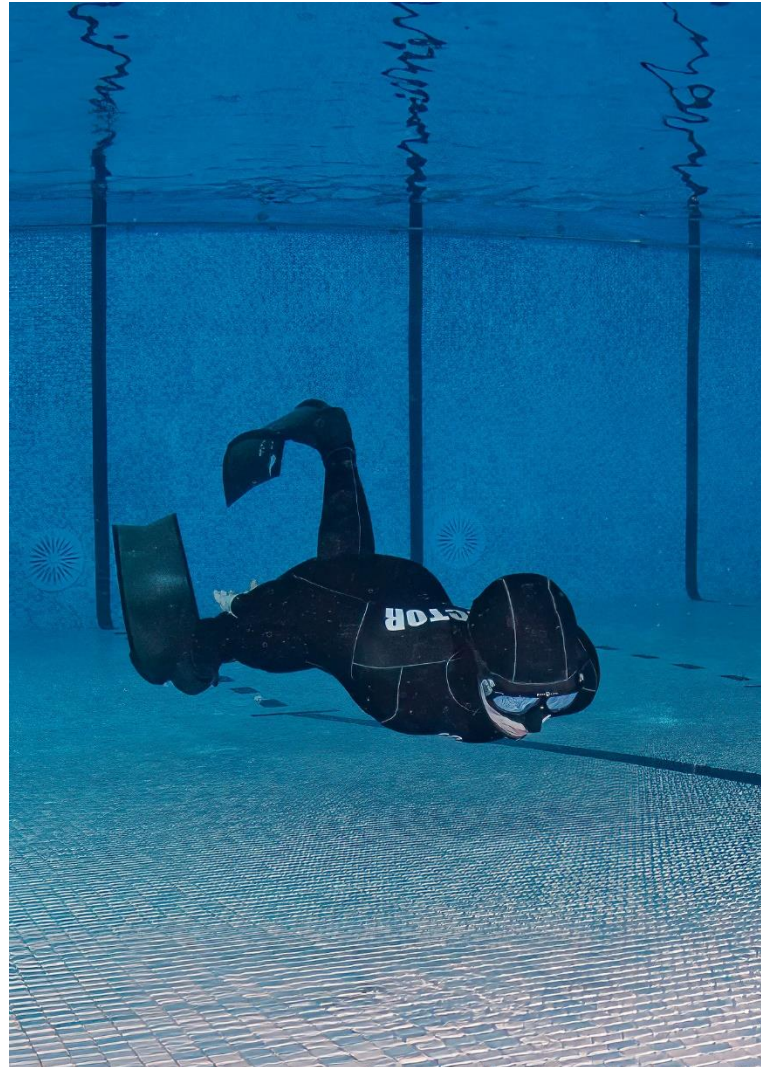
Put simply, dynamic apnea is swimming shallow underwater in a horizontal plane while breath holding. This is typically performed in a pool.

There are 3 disciplines within dynamic apnea, these are:

1. Dynamic apnea with bi-fins (DYNB)
 - The diver swims horizontally in shallow water using bi-fins.
2. Dynamic apnea with a monofin (DYN)
 - As above but using a monofin instead of bi-fins.
3. Dynamic apnea, no fins (DNF)
 - The same as dynamic apnea above, but the diver is propelled using a modified breast-stroke - without fins.

Dynamic apnea is practiced as a competitive pool discipline, as well as a training exercise in either pool or open water. This course will cover proper dynamic technique and supervision for dynamic with bi-fins (DYNB) and dynamic no fins (DNF). Dynamic apnea using a monofin is covered in a separate Monofin Freediver Specialty course.

Dynamic apnea is a popular competitive discipline but can also form an important part of your freedive training. It is also a fun way to enjoy freediving, especially when access to depth is limited due to weather conditions or location.



BREATHING FOR FREEDIVING

If you've already completed the RAID Open Water Freediver certification, Foundation Freediver certification, or completed a RAID Try Freediving course, you will have covered breathing for freediving. Let's recap on what we learned.

The full process of a freedive can be divided into four stages:

1. Relaxation
2. Pre-dive breath
3. Breath hold/dive
4. Recovery breathing

The overall quality and experience of a dive is very much a function of preparation. It is helpful to think of each dive as a circle, rather than a linear, goal-oriented line. In this way, we can better envision the flow from the relaxation stage to the dive, to recovery and relaxation again. If any part of the process is compromised, the circle is broken, and the experience diminished.

RELAXATION

The process of stilling the mind actually comes way before the dynamic apnea swim. It is useful to follow a plan and create a preparation strategy that maximizes routine and minimizes stress. Breathing correctly is key to this, ensuring that you do not hyperventilate. By keeping levels of CO₂ stable in the blood and your breathing preparation gentle and relaxed, your body moves into the parasympathetic state and this in turn relaxes the mind.

Freedivers use the relaxation stage to adopt a conscious, calming and relaxed breathing pattern, preparing body and mind for the next dive.

The three goals for the relaxation stage are:

- a) Avoid hyperventilation
- b) Achieve a deep state of relaxation
- c) Focus your concentration on the dive ahead

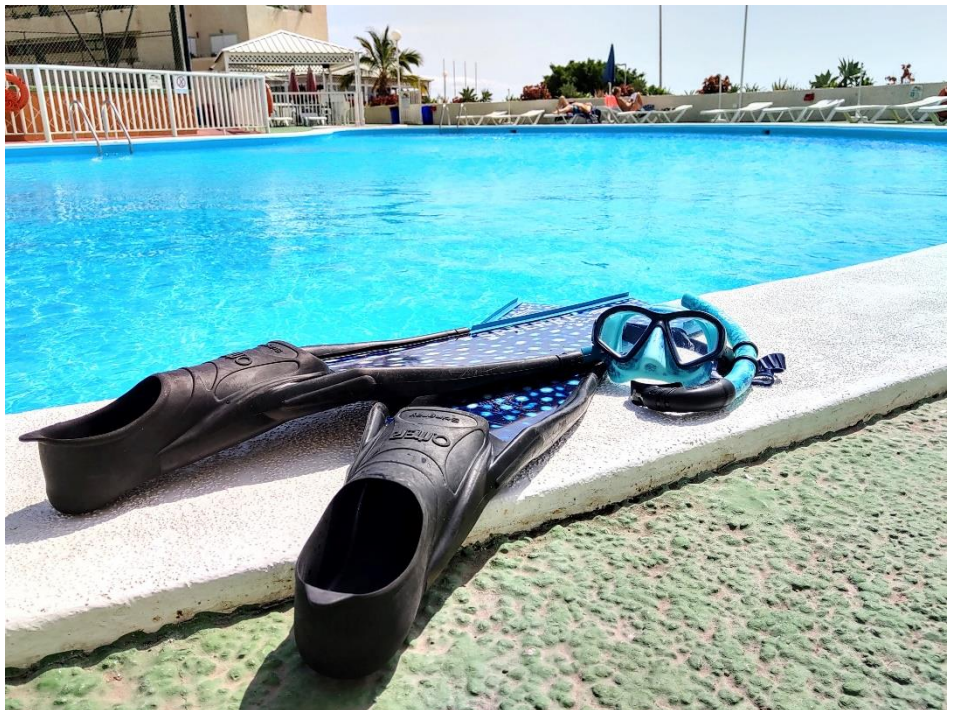
Avoiding Hyperventilation

When we first start paying attention to the breath, it's perfectly normal to breathe too much, although this is counter-productive to safety, relaxation and oxygen availability.

Breathing too much (hyperventilation), greatly increases the risk of blackout in breath hold diving. As freedivers, we avoid hyperventilation by consciously adopting a relaxed, natural breathing pattern during the relaxation stage.

Tidal Volume Breathing

If you are in the water, rest on the surface and let buoyancy support you. Relax your entire body - using only as much effort as needed to keep your mouth or your snorkel (if using one) above the surface.



BREATHING FOR FREEDIVING

If you are in the shallow end of the pool preparing for a dynamic swim, then you can kneel on the bottom, relaxing your body with your head out of the water.

For dry practice, find a comfortable position - use rolled blankets or pillows to support any parts of your body that may need it, such as knees, lower-back, and neck.

Relax your abdomen completely, allowing it to move easily with each breath. Avoid using the middle and upper breathing spaces. After a few minutes of relaxed breathing, the amount of air moving through your lungs will naturally settle toward tidal volume*. If you feel the urge to take a deeper breath or sigh, go ahead. Don't suppress or over-control. Remember, our objective is to avoid breathing too much.

RAID NOTE: Reminder - tidal volume is the volume of air you breathe while at rest

Once you've established a comfortable rhythm, try extending your exhalations, gradually making them up to twice as long as your inhalations, whilst ensuring that the volume of air exhaled is the same volume inhaled. When this becomes easy, you can introduce a brief pause after each exhalation to amplify the relaxation effect.

This type of relaxed abdominal breathing stimulates the parasympathetic nervous system (relaxation response). Lengthening exhalation and adding a slight pause enhances the effect and can help restore balance if you find you've been over-breathing.

Relaxation

When the breathing pattern has become natural, you may want to let it slip into the background - allowing the body to take control. At this point, any of a variety of relaxation techniques can be helpful.

Here are a few examples:

- Focusing on the sensations of floating in water can very effectively quiet the mind. Let your body move passively with the water, and simply attend to any sensations that arise.
- Body scan - bringing awareness to various parts of your body and consciously relaxing them. In addition to areas of obvious tension, include some you don't normally pay attention to, such as your tongue, eye sockets, ears, etc. The neck in particular tends to hold a lot of tension in freedivers - as we instinctively try to lift our heads out of the water.

Focus

Some people find it useful to visualize the dive during the relaxation stage. It's important to visualize every stage of your dive, and the same goes for a dynamic apnea swim. Include all the small details, for example, your body position during relaxation breathing, your pre-dive breath, how you fin during the dynamic swim, the way in which you will turn at the end of the pool, and so on. We will talk more about visualization later in the manual and give you some techniques to try in the pool.

PRE-DIVE BREATH

When you are fully relaxed and ready to perform your dive, you will take your pre-dive breath. The pre-dive breath consists of three parts.

1. A quick inhale...
2. ...followed by a full exhale – attempt to squeeze out as much air from your lungs as you can
3. A three-part breath:
 - Breathe into the abdomen - this includes breathing into the back, front and sides of the abdomen and pelvis.
 - Breathe into the ribs - expand the middle breathing space, including both front and back of the ribcage as well as side-to-side (out into the armpit area).

BREATHING FOR FREEDIVING

- Breathe into the upper chest - the last part of your inhalation should fill up the very top of your chest, neck, and shoulder girdle.

The lungs are bigger at the bottom than the top. To ensure that you are fully utilizing this space, the full breath should be taken slowly, focussing on the feeling of the air reaching spaces which are not often used in everyday life. Don't fight or force this breath. Release it if it feels unnatural and try again after relaxing a little.

DYNAMIC APNEA SWIM / DIVE

Now that you have taken your pre-dive breath, you can commence your dynamic swim. Your instructor will guide you through the process and techniques used during a dive. Here we'll focus on the sensations that occur during a breath hold.

The Urge to Breathe

As CO₂ levels increase, you'll begin to feel the impulse to take a breath. It is this increase in CO₂ and NOT the absence of O₂ that stimulates the urge to breathe. If you've avoided hyperventilating during the relaxation stage, you'll have plenty of O₂ remaining at the onset of this urge.

Diaphragmatic Contractions

As your breath holds become longer, you may experience what are commonly known as contractions. These involuntary spasms of the diaphragm are your body's way of trying to get you to take a breath, expel CO₂, and bring blood acidity back to normal.

Contractions may feel unpleasant at first, but once you become accustomed to the sensations, you'll learn to relax through them. With training, your tolerance of CO₂ will increase. This, and remaining relaxed, can delay the onset of contractions.

Other signs of elevated CO₂ levels include:

- An urge to swallow
- Tightness or burning around the chest
- Headaches (after prolonged periods of high CO₂ - usually caused by too short a relaxation stage between multiple dives)
- Strong urge to let air out. (Avoid releasing air during a dive – this will be treated as a blackout situation and rescue initiated immediately)
- Heat in the body

RECOVERY BREATHING

At the end of a dynamic apnea swim, we want to restore oxygen levels as quickly as possible. There are different techniques, but the principle stays the same - to quickly bring fresh oxygen-rich air into your lungs, and to have it absorbed as quickly as possible.

Technique

At the end of a long breath hold your body wants to forcefully exhale in order to purge CO₂. We want to prevent this for two reasons:

1. A very brief and shallow exhale allows us to take fresh air in as quickly as possible.
2. A deep exhalation can abruptly lower the concentration of oxygen in your blood - greatly increasing the likelihood of a blackout or hypoxic fit.

Recovery breaths consist of a quick, passive exhale, a strong inhale with a wide-open mouth, and a pause with closed lips and glottis. During the pause, the chest and diaphragm are contracted with moderate force - as if holding back a cough - while the breath is held for 1-3 seconds. **This is also known as 'hook' breathing**. This pattern is repeated 4 or more times - depending on the intensity of the breath hold.

BREATHING FOR FREEDIVING

Even with this technique, it can take a full minute for the oxygen to reach your brain. Once you feel recovered, the final part of every freedive is to make the “OK” sign by putting the thumb and forefinger together and saying, “I am OK”, while looking at your buddy.



RAID Note: The number one rule of freediving is to always dive with a qualified buddy.

You and your buddy act as safety divers for each other. There are different methods of buddying depending on the freediving discipline, but the role is always the same - to look out for and assist the diver and be there to act in case anything goes wrong. We will discuss in detail the role of the buddy in dynamic apnea later in this manual.

To assure complete recovery after a dive, the buddy must monitor a freshly surfaced diver for a full 45 seconds. In competitions it is not uncommon for a diver to surface, remove his/her mask or nose clip, signal with the OK sign, say “I’m OK” then blackout or experience a hypoxic fit.

Here is a summary of the steps involved in recovery breathing:

1. Small, passive exhale without activating any breathing muscles
2. Sharp inhalation with wide open mouth
3. Pause with closed lips and glottis, bearing down with moderate force to create pressure for 1 to 3 seconds (hook breathing)
4. Repeat at least four times, or more if needed
5. Make the “OK” sign and say “I’m OK”

Make a habit of doing recovery breaths after every dynamic dive, regardless of its time. Recovery breathing does not come naturally, so it is important to program it through repetition.

Diver’s lives have been saved by having this procedure so deeply ingrained that it was performed when they were barely conscious.

That concludes the 4 stages of a dynamic apnea swim / dive. Let’s now recap on the dangers and sensations of hyperventilation.

HYPERVENTILATION

Hyperventilation is defined as breathing more than necessary to sustain the current level of metabolic activity. While it's not uncommon for this to occur during the course of a day, it is extremely dangerous when combined with in-water breath holding. Hyperventilation will lower the level of CO₂ in your body but will not increase O₂ levels in your blood which, when at rest, are typically between 96 and 99% saturated.

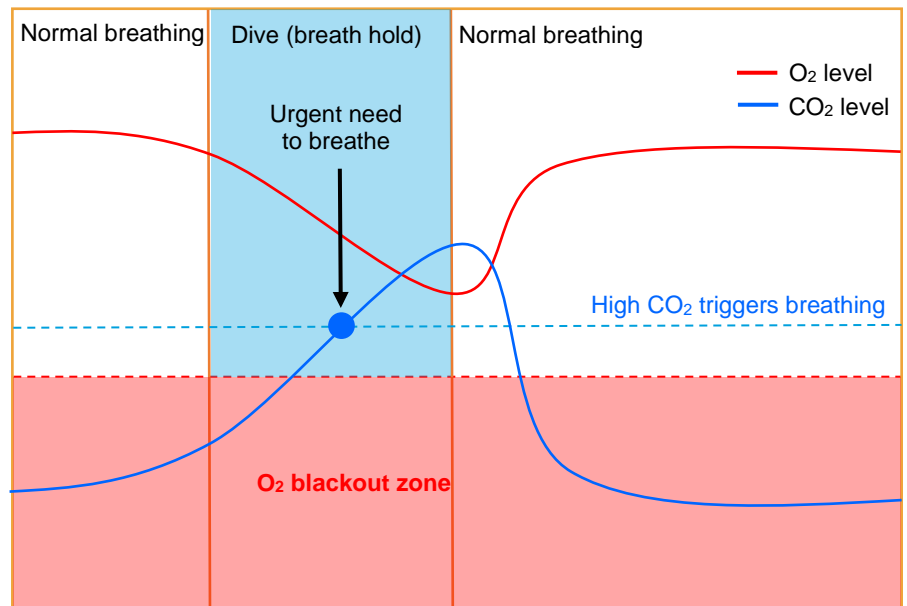
Hyperventilation raises the risk of a hypoxic blackout in the following ways:

1. Reduced CO₂ increases blood alkalinity - reducing our ability to absorb oxygen (the Bohr effect - see below).
2. Low CO₂ delays the urge to breathe - further increasing the risk of hypoxia (low O₂).
3. Hyperventilation increases O₂ consumption by accelerating the heart rate and stimulating the fight-or-flight response (sympathetic nervous system).
4. The capillaries in the brain contract (cerebral vasoconstriction), reducing blood supply to the brain and contributing to loss of consciousness.
5. Repeated dives with hyperventilation have a cumulative effect - progressively reducing the amount of O₂ available in your blood and tissues.

In the graphs, you can see the relationship between CO₂ levels and the urge to breathe. Remember that it is a rise in CO₂ that triggers the urge to breathe, **not** a reduction / lowering in O₂ level.

The first graph shows the O₂ and CO₂ levels in the blood over the duration of a safe dynamic breath hold. Stable and consistent O₂ and CO₂ levels are shown on the left in the relaxation stage (normal) breathing.

The dive ends when the diver has an urge to breathe, triggered by rising levels of CO₂.



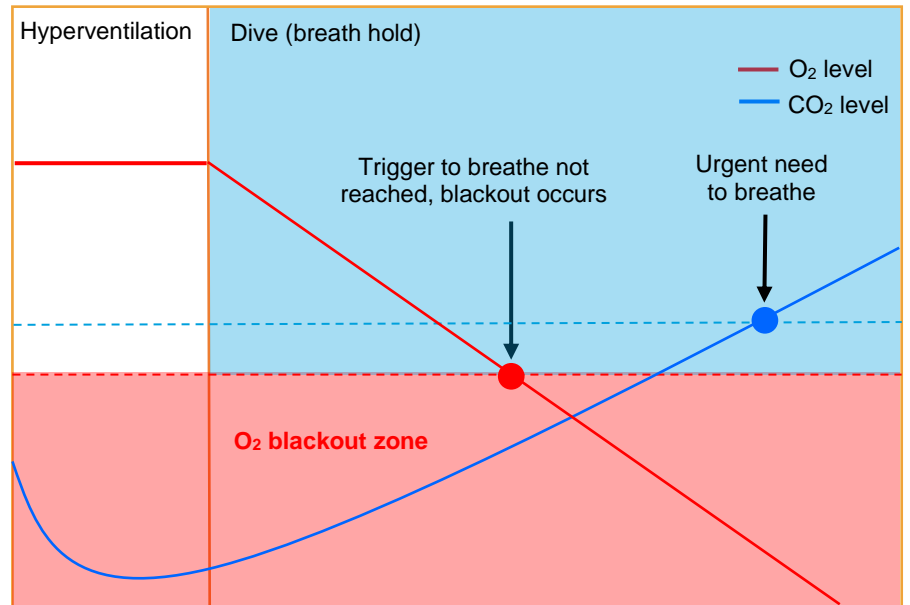
EQUIPMENT

The second graph shows how hyperventilating before a dive affects O₂ and CO₂ levels. You can see that the O₂ level is unchanged by hyperventilation, however CO₂ levels decrease dramatically. This pre-dive state is likely to result in a blackout (BO). The urge to breathe, triggered by rising CO₂ levels, does not come until after a lowering in O₂ level, to the point where consciousness cannot be sustained, and the diver blacks out. Put simply, the urge to breathe comes too late.

The dive duration is longer, but at the cost of a blackout situation.

Sensations / Symptoms of Hyperventilation

The technical term for low CO₂ caused by hyperventilation is Hypocapnia. Developing the ability to feel the more subtle signs of hypocapnia takes time and practice. Below is a list to provide some guidance, but not having these symptoms does not necessarily mean you are not hypocapnic.



The best prevention is to use the conservative relaxation stage breathing pattern described in this manual, and to engage some of the dry practice suggestions that follow in order to refine your sensitivity and tolerance.

Sensations / Symptoms could include the following:

- 'Light-headedness'
- Mild-to-extreme euphoria
- Dizziness/disorientation
- Tingling in the extremities and/or all over the body
- A metallic taste in the mouth
- A contraction of the muscles in the hands and/or feet, which can extend to the whole body - 'carpopedal spasm'
- Convulsions
- Unconsciousness
- An unusual feeling of well-being
- Sudden extreme hunger

EQUIPMENT

You may already have some pieces of your own equipment.

Correct equipment is essential to gaining the most out of your freediving. Having correctly fitted, comfortable equipment is vitally important. The wrong equipment or badly fitting equipment can be a huge distraction. Below is a list of equipment you may need for a dynamic apnea session.

Again, your instructor can advise you if there are pieces of equipment you still need:

EQUIPMENT

- **Pool Suit** – correct type and thickness for freediving. Depending upon the water temperature in your area, you will require a wetsuit that protects you from the cold and the environment. Generally, we will use either a 1-piece freediving pool suit with a thickness between 1mm and 3mm, depending on water temperature. A smooth skin suit offers significant advantages, as it causes less drag in the water. Smooth skin neoprene is the most hydrodynamic exterior for a wetsuit. Smooth skin suits are very fragile and require much more care and gentle handling when putting on and taking off. A traditional open water freediving suit is two-piece, with open cell neoprene on the inside and a nylon exterior. Pool suits are the opposite of this – much thinner, with nylon on the inside and 'smooth skin' on the exterior. Smooth skin is where the open cell neoprene has not been lined during the manufacturing process but has been pressed to seal the neoprene resulting in a smooth, shiny finish.
- **Mask** - ideally low volume.
- **Goggles** - For pool disciplines, you may choose to use a pair of swimming or freediving goggles. Either will work fine in a dynamic session if that is your preference.
- **Nose-clip** - If you wear a pair of goggles rather than a mask, a nose-clip can be a useful addition to your freediving equipment. There are many different types and makes. The purpose is to keep the nostrils closed, so that water does not enter them.
- **Snorkel** - You will need a snorkel for safe and effective buddying for dynamic. Depending on how you perform your relaxation breathing, you may want to immerse your face and use a snorkel. Choose a simple, non- purge, flexible “J” shaped snorkel.
- **Bi-fins** - Freediving fins with a closed foot pocket and long blades. These can be polymer (plastic), fiberglass, carbon fiber, or composite (made from a mixture of materials). The foot pockets are made from silicone and fully enclose your feet with no straps or buckles.
- **Monofin** - Although not within this scope of this course, many freedivers like to practice dynamic apnea in a monofin. There are lots of things to consider when choosing a monofin. See the Monofin Freediver Specialty course for details on fin choice, swimming technique and more.
- **Fin socks** - optional. Fin socks are made from neoprene and help keep your feet warm, ensure a snug fit with the foot pocket and help prevent chaffing. Thickness can vary from 1mm to 9mm.
- **Fin retainers** - optional. Fin retainers are rubber straps that go over your foot pockets and around your ankle and heel. They help secure your fins, making it less likely that they'll come off under stress.
- **Weight belt** - Stretchy rubber or silicone weight belt that can be worn around the hips to avoid interfering with the diaphragm and quick release design.
- **Weights** - Lead weights designed to be threaded onto a weight belt. 2lbs/1kg are the heaviest weights you should consider. Heavier weights will be bulkier and cause drag.
- **Neck weight** - optional. A neck weight can help to streamline the body during dynamic apnea. They are typically between 1kg and 2.5kg, and there are a few different types available.
- **Instruments** - it is recommended to have a timing device so that you can time swims, and safely buddy for each other. This can be as simple as your watch, a stopwatch or a freediving watch / computer.

FIN SELECTION

Fin strength has a big impact on how easy it is to master the correct technique. Put simply, the greater the stiffness of the fin, the harder it will be to move through the water because it flexes less.

HOW TO PERFORM DYNAMIC APNEA

Consequently, when selecting your fins, you should take into account what they will primarily be used for. If you are big and strong and going for depth, then a stiffer fin may be appropriate. But if you are slighter and intending to do a lot of shallow recreational diving with lots of surface swimming, then you will need a softer fin.

You may decide that you want a pair of fins for depth diving, and something entirely different for pool diving. It is much harder to perform correct finning techniques for freediving on the surface than it is under the water, so in a pool environment, or in shallow water, a softer fin may be preferable. If you are using your fins in the pool, then you also need to consider that you will not need to overcome positive or negative buoyancy, so choose a fin strength that makes it easy to fin a long distance and works well on the surface when buddying.

HOW TO PERFORM DYNAMIC APNEA

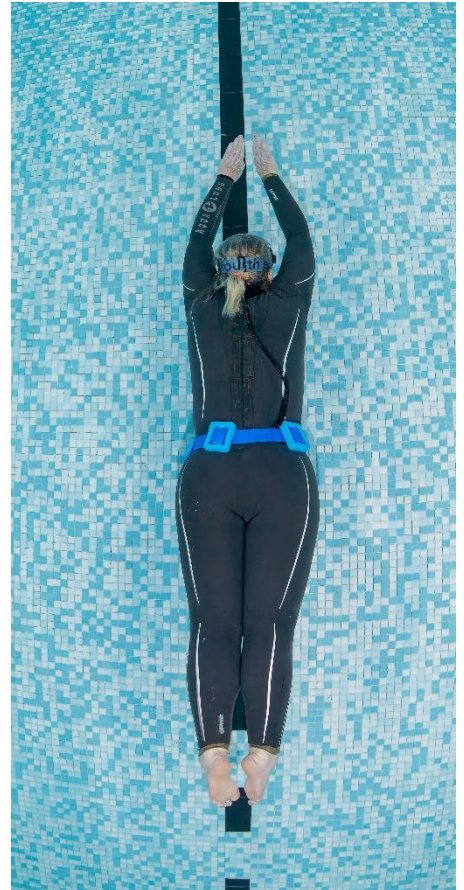
BUOYANCY

First, we want to check your buoyancy. This can be difficult for dynamic apnea, especially if the pool or body of water you are in has differing depths. Where depths differ, we want to make sure you have sufficient negative buoyancy in the shallow end that you don't continually pop back up the surface, but not so much weight added that you sink in the deep end.

How to assess your buoyancy

At the edge of the pool, perform your normal pre-dive breath so that you have the same amount of air in your lungs as you would for a dynamic apnea swim. **Do not wear your fins.** Then, bend down in the water, push off, and glide. Don't move your arms or legs at all. If you immediately pop to the surface, you need more weight. If you sink or scrape along the bottom of the pool, you need to remove weight. When you think you have the correct amount of weight, do one length (presuming the pool is 25m/80ft. or less) with fins, seeing how your buoyancy changes in the deep end. You may find you need to remove some weight if you sink in the deep end.

Establishing correct buoyancy is easier performing dynamic with bi-fins (DYN), than it is with no fins (DNF). With fins, you have the ability to easily correct your position in the water. With no fins, you do not have the same control or propulsion, and so even the tiniest adjustment in weight can make a difference. Many top dynamic divers find that their weighting set up changes all the time and it can be the hardest part about the discipline to get right.



RAID NOTE: Your buoyancy will change depending on your body composition, exposure suit thickness and salinity of water. If you lose or gain significant amounts of weight, your body composition changes, you wear a different exposure suit, or change location from freshwater to seawater or vice versa, be prepared to re-check your buoyancy. Even changing pool location may affect your buoyancy, so make sure you perform a buoyancy check at the start of every session.

When checking your buoyancy, you might want to consider either all the weight around your hips on a weight belt, all the weight around your neck and shoulders using a neck weight, or a combination of both. One disadvantage of using a neck weight is that, depending on the weight, it needs strong neck muscles to hold the head up when upright on the surface. Many freedivers do not like the feeling of anything impeding their ability to hold their head up. What works for you will depend largely on your body composition.

Buoyancy may take some time to get right but is critical. No matter how good your technique is, if your buoyancy isn't correct, your performance will be hindered.

The following sections discuss the finning / stroke techniques for both dynamic with bi-fins and dynamic no fins.

DYNAMIC APNEA BI-FINS (DYNB) TECHNIQUE

How to start your dynamic apnea swim

For dynamic swims, the most commonly used starting position is to be kneeling in a relaxed position with your fins on the pool bottom behind you, next to the edge of the pool. Your pre-dive breath is taken in this position. Once you have performed your pre-dive breath, put your arms in front of you and duck dive into the water as if you are diving over a pool noodle at the surface. As soon as your head and torso are under the water, do an arm stroke to propel you forward, and start finning. The majority of people are most comfortable with their arms by their sides.

If you have sufficient flexibility, you may wish to have your arms over your head. However, most people fail to achieve a hydrodynamic position like this, and find it is tiring to maintain. Remember, relaxation is key! If you are starting in very shallow water, make sure you are very close to the bottom of the pool. If the pool has lane markings on the bottom, make sure you follow the line and keep your head tucked in to maintain streamlining.

Finning technique

Freedivers use a modified version of the 'flutter kick' used by swimmers. The movement should come from your hips; toes pointed and knees as straight as possible. Your kick should be roughly equal front-to-back and unhurried, with minimal knee bend. Too much knee bend will make your fins slide through rather than against the water, losing efficiency because the blades don't encounter enough resistance to flex. The amplitude (size) of your kick depends on the material and stiffness of the fin blade. Too much amplitude will result in more drag, while too little will not allow the fin blades time to flex and return, reducing speed and efficiency.



When finning, keep your head tucked in and in line with your body, and concentrate on a steady, even fin stroke. Your body needs to offer minimum drag through the water, so keep your upper body parallel to the bottom, regardless of whether your arms are by your sides or above your head. You should be looking at the bottom of the pool if your head is in the correct position. If you raise your head to look where you are going and/or arch your back, you are increasing your drag through the water.

Something to consider when diving with bi fins is this; get the fins to do the work for you. Once you have made a fin stroke, let the fin blade finish the movement before reengaging it. This will also help ensure you have a steady stroke rate.

You may experience your body rolling from side to side. There is often a slight roll naturally with your hips, but this should not be very noticeable. Just remember, you don't walk with a big hip roll. Often connected to this is the scissoring out of the legs. Freedivers often say this is because they don't want the fins to hit each other as they pass. However, this will only ever be an issue if you are pigeon-toed as you fin, with your toes pointing inwards. Try to ensure that you fin with your hips level and your legs moving on an even plane backwards and forwards. To begin with, you may need to select very soft or short fins until you master the technique, and your ankles strengthen.

You will also need to check that both legs are working with equal strength, and that your fins fit snugly and comfortably. By minimizing any shift of the fins on your feet, you will maximize the transference of power through your legs, down through the blades and into the water. You can use neoprene fin socks – these keep your feet warm, prevent chafing and can provide a nice, tight fit.

Choose comfortable fins that will enable you to easily master finning techniques for freediving without compromising power. Keep your upper body streamlined, your legs almost completely straight, and move them equally backwards and forwards with a wide amplitude. Keep your hips level and your toes in line with your leg. Imagine you are walking and let the blade finish a stroke before you start a new one.

HOW TO PERFORM DYNAMIC APNEA

Take some time and feel your way into the best stroke for your fins.



To recap on finning technique:

- Flutter kick
- Movement comes from the hips
- Straight knees
- Wide amplitude (but not so wide as to cause drag)
- Same amplitude kick forwards and backwards
- Allow the resilience of the blade to finish the stroke
- The same speed as a relaxed walk

Your instructor will give you tips to improve your finning technique.

Arm positioning

You can either keep your arms in a relaxed position by your sides as you fin, or bring them over your head, pointing in front of you. The second position gives better streamlining if done correctly, however uses more energy. The arms should be straight, the palm of one hand placed on top of the back of the other hand, and in line with the center line of your body. The chin then needs to be tucked in, resting on the chest if possible. This can be a stress position for many freedivers, so although it offers streamlining, it might not be comfortable. Also, if your arms drop, aren't completely straight, or are not in alignment with the center line of your body, you will not be streamlined, and will cause more drag through the water.

It's a personal choice how you position your arms during a dynamic bi-fins swim. You need to weigh up the benefits of streamlining versus comfort and relaxation. If you are streamlined but uncomfortable, it is likely to affect your performance.

Turning in a pool

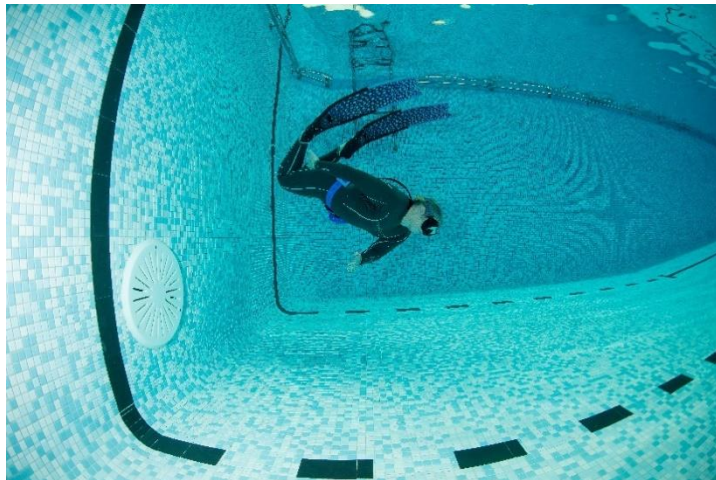
Public swimming pools vary in length but are normally either 25m/80ft. or 50m/165ft. in length. At some point, you are going to want to continue your swim beyond the distance afforded by swimming in a straight line in a pool, so you will need to turn when you reach the end of the pool.

HOW TO PERFORM DYNAMIC APNEA

The way in which you turn in a pool is very important and, when done correctly, will conserve oxygen and promote efficiency.

You should visualize the turn at around an arm's length from the end of the pool. If the pool has lane markings, there is usually a "T" shape on the lane marker towards each end of the pool. This is great visual reference. If the pool does not have lane markings, you can use a weighted belt, or other non-moving marker as a visual reference.

Swimming in the center of the lane, along the lane marker, as you approach the end, move slightly away from center. Place your forward hand on the pool end and use it to help you turn / pivot (towards the lane center, not away from it).



As your legs tuck and come around, use the other hand to sweep the water, propelling you forward and away from the pool end. Do not slow before you turn, use the momentum of your finning to assist in your turn.

Try not to push off the wall with your fins. It is possible for your fins to create a vacuum against the pool wall and suck to it. Also, with carbon fiber fins, you may damage your fins if they hit the pool edge.

RAID NOTE: Turning with a monofin requires a special technique. Monofins typically have sharp edges, and care must be taken when swimming near others, turning and finishing a dive. They are easily damaged on pool walls if they hit the wall during a turn. See the Monofin Freediver Specialty course for specific requirements for diving with a monofin.

Finishing the swim

We will talk about the sensations or feelings you might experience during your dynamic breath hold later in this section. Whether it is one of these feelings, or a pre-discussed distance reached that ends your dive, there is a correct protocol to finish the dynamic swim in a safe, controlled way. It's worth noting that even if you have declared a distance for your swim, if you feel it is too hard, too much, not going as planned while you are swimming, end the dive early. There is no point pushing to meet a specific distance if it's not feeling right or not going well.

1. Firstly, come to the surface. If you are in the deep end of a pool and have accidentally drifted off the horizontal plane and to the bottom, don't passively come to the surface. Swim up to the surface without delay.
2. If you are at the end of the pool, bring your hands to the edge of the pool, so that both hands are holding gently, but securely, onto the pool edge.
3. If you are mid-length, but next to the pool edge, turn to the pool edge and bring both hands to the edge of the pool as a support.

HOW TO PERFORM DYNAMIC APNEA

4. If the lane you have been swimming in is a mid-lane, i.e. you don't have a pool edge on which to hold, use either the fixed surface lane markers, your buddy's arm, or a pool float to support yourself.
5. In an upright position, i.e. you are not lying down on the surface of the water, ensure your face is clear of the water.

IMPORTANT : Do not let any air out until your face is out of the water and you are looking at your buddy. Never let any air out while your face is still in the water.

6. Once your airway is clear of the water, bring your face up to look at your buddy, and perform recovery breaths as described in the earlier section. Your buddy will have hold of you underneath the armpit nearest them, and they will encourage you to look at them and perform recovery breaths correctly.
7. Once you have performed 3 to 4 recovery breaths, more if you feel you need to, or if your buddy tells you to continue, give your buddy the OK signal and tell them that you are OK.

Common mistakes / problems

When starting to think about using fins, it's helpful to get out of the water and look at how people walk. When we walk around, our legs are almost straight the whole time, and move an equal amount forward and back. We don't move our legs as if we were pedaling a bicycle, only move them from in line with our body to behind us or raise our knees up and down with the shins vertical and the toes pointed. Yet these are the most common mistakes people make when first learning how to fin.

Why does this happen? Apart from the unfamiliarity of being in the water learning a new skill, the biggest issue is, unsurprisingly, the fins. When freediving we wear long fins, and these displace a lot of water. This makes using them difficult for some people as they learn to use their muscles in a different way.

When you first start to fin, it's almost certain that the biggest mistake you will make is having a strong backward stroke (the part where your legs and fins go back behind your body) and a non-existent forward stroke (where your legs move from in line with the rest of your body to out in front). This is because it is easier to move the fins backwards and more challenging to bring them forwards. You also may be subconsciously worried about damaging your fins on the bottom of the pool. Ask your buddy to check as you practice your finning – if your fin tips can be seen breaking the water surface, it is likely that you have no forward stroke, and are finning with a backward stroke only.

To correct this, if you have access to deep enough water, it is helpful to practice your finning upright on the surface. If you are upright with your head out of the water, try finning. If your legs end up behind you, tipping you forward, your forward stroke is too weak. Once you start to improve your forward stroke, the tendency is then to bend your legs at the knee, as this makes the stroke easier. Try not to fall into that habit – instead, keep your legs straight and concentrate on developing an equal forward stroke and backward stroke.

Another common mistake is head positioning. Your head should be in line with your spine, and you should be able to see the bottom of the pool. Raising your head to look where you are going will increase drag and you will no longer be streamlined. To correct this, concentrate on being able to see the bottom of the pool. This can be easier if the pool has lane markings, as they are typically located in the center of the lane, and you can simply concentrate on following them. If you are looking at lane markings, your head is in the right position.

One mistake during turns while wearing fins, is hitting your fins against the pool wall. Make sure you tuck your legs in before you sweep your legs round, or your fins may contact the pool wall.

DYNAMIC APNEA NO FINS (DNF) TECHNIQUE

How to start your dynamic apnea swim

As with dynamic with bi-fins, the most commonly used starting position is to be kneeling in a relaxed position with your toes resting against the pool side. Your pre-dive breath is taken in this position. Once you have performed your pre-dive breath, duck down in the

HOW TO PERFORM DYNAMIC APNEA

water, bend your legs placing your feet against the pool wall, and push away from the pool edge as you straighten your legs. Glide with your arms stretched in front and legs straight. Your arms should be in line with your body to give a straight, streamlined position.

Stroke technique



This skill requires you to use a modified breaststroke. As you start your dive, you will be gliding with your legs together and straight, and arms outstretched in front of you, in line with your body.

As your glide starts to slow, you perform an arm pull, much like the movement used in breaststroke. The arms will transition from a pulling action to a pushing action during your stroke. Initially, sweep your hands outwards at a 45-degree angle, and pull the arms towards you as if you are doing breaststroke. As your hands reach approximately the same level as your shoulders, bring your hands close together and continue the movement of your arms, pushing the water towards your feet. You are creating a 'key hole' shape.



At the end of the stroke, let your arms come to rest at your sides near your hips. Glide in this position. Your legs will still be straight, but your arms are now by your sides.

As the glide slows, perform a frog-style kick, and at the same time bring your arms up along your body to minimize drag, and stretch them out in front of you again. Glide in this position. This sequence is repeated, i.e. arm stroke, glide, legs kick and arms forward, glide, and so on.



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As with dynamic bi-fins, your head should be in a relaxed position, in line with your spine with your chin tucked in.

There are slight variations on this. Some freedivers like to do two frog-style leg kicks instead of one. The first will be at the same time as moving the arms into the outstretched forward position, followed by a second leg kick, keeping the arms in front. Another variation is to do a dolphin kick with both legs together at the end of the arm pull. Experiment with what works for you. Your instructor will demonstrate and help with technique.

Dynamic no fins technique is much easier if you are wearing a smooth skin freediving pool suit. The suits are typically very tight fitting and make you more hydrodynamic in the water.



Turning in a pool

Getting the turn right when you are performing dynamic no fins swims, can make a huge difference. The edge of the pool gives you a solid platform to push away from and gain momentum after your turn.

As with dynamic with bi-fins swims, you should visualize the turn at around an arm's length from the end of the pool. Use the "T" shape on the lane marker towards each end of the pool as a visual aid to signify you are nearing the pool end. Again, if the pool does not have lane markings, use a weighted belt or other non-moving marker as a visual reference.

Swimming in the center of the lane, along the lane marker, as you approach the end, move slightly away from the center line. Place your forward hand on the pool end and use it to help you turn / pivot (towards the lane center, not away from it). As your legs tuck and come around, place your feet against the wall, and push powerfully away from the side by straightening your legs. At the same time, bring both arms forward to stretch them out in front of you in the glide position. The push away from the wall will propel you forwards and away from the pool end. Do not slow before you turn. Use your momentum to assist in your turn.

Finishing the swim

The protocol for finishing a no fins dive is the same as that for a swim with fins.

1. Firstly, come to the surface. If you are in the deep end of a pool and have accidentally drifted off the horizontal plane and to the bottom, don't passively come to the surface. Swim up to the surface without delay.
2. If you are at the end of the pool, bring your hands to the edge of the pool, so that both hands are holding gently, but securely, onto the pool edge.
3. If you are mid-length, but next to the pool edge, turn to the pool edge and bring both hands to the edge of the pool as a support.
4. If the lane you have been swimming in is a mid-lane, i.e. you don't have a pool edge on which to hold, use either the fixed surface lane markers, your buddy's arm, or a pool float to support yourself.

HOW TO PERFORM DYNAMIC APNEA

5. In an upright position, i.e. you are not lying down on the surface of the water, ensure your face is clear of the water. Remember to not let any air out until your face is out of the water and you are looking at your buddy. Never let any air out while your face is still in the water.
6. Once your airway is clear of the water, bring your face up to look at your buddy, and perform recovery breaths as described in the earlier section. Your buddy will have hold of you underneath the armpit nearest them, and they will encourage you to look at them and perform recovery breaths correctly.
7. Once you have performed 3 to 4 recovery breaths, more if you feel you need to, or if your buddy tells you to continue, give your buddy the OK signal and tell them that you are OK.

Common mistakes / problems

There are a number of common mistakes that can occur during a dynamic no fins swim. The first is slowing down too much during your swim. If you mis-time the transition between glide and stroke or glide and kick, you can lose momentum. If you slow down too much, you may float up to the surface. Technique and buoyancy are key here, so spend time getting your buoyancy correct and honing your technique.

Another common mistake during dynamic no fins swims is not turning close enough to the wall. If you turn too far from the wall, you won't be able to push away as forcefully with your legs and feet. Using the wall to push away from effectively can give you significant advantages in dynamic no fins. For this reason, a 25m pool is arguably better than a 50m pool, as you can turn more often, making best use of that powerful push away from the pool edge.

Another mistake that can occur during a turn is incorrect positioning in the lane. You may attempt to turn in line with the center lane marking, rather than coming to one side of it. If you turn in the center of the lane, you will end up either turning and swimming back off center, or get in a muddle during the turn, trying to turn in too tight a space. This mistake is also seen during dynamic bi fins swims.

Arm position during the glide phase is an area some people struggle with. If you don't have the flexibility or range of movement to keep your arms outstretched in front of you in line with your body, you will not be as streamlined in the water, and your positioning will cause excess drag during your glide.



Photo shows incorrect leg position during arm pull. Legs should be kept together.

Another common mistake is leg positioning following the frog-leg kick. Your legs should be straight, but also kept together. If you let your legs drift apart after your kick, it will affect your streamlining, and will slow you down.

Orientation in the water column is another area where problems may occur. If your buoyancy isn't spot on, or you change depth in a sloping-bottom pool, your performance will be affected. It's important to try to maintain the same horizontal plane within the water column, while staying underwater.

There are also a number of problems you may encounter during dynamic no fins, which aren't directly related to your technique, but more towards body composition and physical attributes. A slim, lean person with very little body fat, in a tight, well-fitting smooth skin pool suit, will have a significant advantage over a larger built person not equipped with a pool suit. A well fitted pool suit is a definite advantage for dynamic pool disciplines, especially those that are smooth skin on the external surface. Buoyancy is affected by body composition. People with higher levels of body fat will typically require more weight added to a weight belt than someone with more muscle and less fat.

As a guide, men typically have higher levels of muscle, denser bones and less visceral fat than women, and so require less weight added to overcome their natural buoyancy. There are exceptions, obviously, and by taking the time to get your buoyancy correct and fine-tuning your technique, you can minimize the impact of body composition on your dynamic apnea performance.

WHAT YOU MAY FEEL / EXPERIENCE DURING YOUR DYNAMIC APNEA SWIM

Whether performing dynamic with bi-fins, or with no fins, during your breath hold swim, you may feel a number of sensations. Many of these feeling may be generated in your body from something you can hear, see, or touch, but the mind can also create sensations. The body and the mind are one, and as well as looking after the body in maintaining a relaxed, comfortable position in the water, we also have to look after the mind to ensure that it is also relaxed.

As mentioned above, you may encounter many different feelings during your breath hold. Let's take a look at some common sensations freedivers experience during dynamic apnea swims.

- The urge to swallow
- The urge to spit out air
- Heat building through the body
- A burning sensation in the chest
- Panic
- Pressure building up in the chest or throat
- Tightness
- The urge to urinate
- Feelings of incorrect buoyancy, being too floaty or too heavy
- The urge to speed up
- Diaphragm contractions

Diaphragm contractions – what are they?

Diaphragm contractions are the body's natural response to increasing CO₂ levels. High CO₂ levels stimulate the diaphragm to move, which manifests in the urge to breathe. Contractions can be anything from a mildly uncomfortable fluttering in the abdomen, to unpleasant convulsion-like movements that travel through the entire body. The feelings you may encounter during a dive are very variable from person to person. Some people may never experience contractions, others may start to feel them after a relatively short breath-hold.

It's worth mentioning that you might experience one, many, or none of these sensations during your dynamic apnea swim. Many people have the ability to completely clear their mind during dynamic apnea and achieve a Zen-like state. Whatever your dynamic swim brings, try to recognize the various stages of your dive and become familiar with the feelings you experience.

For those of us who do not have that ability to “zone out” during a breath hold, and may struggle with the sensations we are feeling, there are a number of techniques we can use to overcome these feelings and distract the mind. Let's look at some techniques for distracting the mind from the task at hand and focusing on other thoughts. This is called Visualization.

VISUALIZATION FOR DYNAMIC APNEA

Visualization has long been used in various forms and in many different sports and activities. All over the world, there are many examples of this. We find visualization and relaxation in meditation and yoga, which are most commonly recognized for relaxation. Visualization is the process of creating a mental image in your mind. It uses sensory information; touch, taste, hearing, sight and smell, and imagination to simulate an experience or situation that feels real.

Research shows that when you visualize a specific task, situation or outcome, the same areas of the brain are activated as when you actually perform that task or experience the situation or outcome. In addition, visualization can lead to a strengthening of the neural pathways that are associated with the specific task or experience.

If you consistently visualize a specific activity or outcome, the neural pathways become stronger over time. The same neural pathways are then more easily activated when actually performing that activity.

HOW TO PERFORM DYNAMIC APNEA



When using visualization to prepare for a dynamic apnea swim, it's important to visualize every stage of your swim / dive. Include all the small details, starting at the beginning and your relaxation phase, and up to and including the end of your swim, surfacing, and recovery breathing. Walk through each part of your dynamic apnea swim in your mind, from your orientation to the lane marker in the pool, to your technique, to each part of your turn. Focus on every aspect of your technique, including all the small details. By visualizing your swim in detail routinely, the neural pathways associated with those activities will become stronger. Familiarity with the steps involved and sensations you may experience during your dynamic apnea swim will help give you consistency in technique and improve performance in this discipline.

Visualization can be used for both relaxation and for focusing the mind and is a powerful tool when used during the discipline of dynamic apnea. During your swim, the focus should be divided between what your body is doing / technique and positioning. As a guide, around 80% of your awareness should be focused on your body, and 20% on awareness of lane position and your position / horizontal plane in the water column.

RAID PRO TIP: The best way in which to become a safe and relaxed freediver during dynamic disciplines is by being comfortable with your freediving distance. You will naturally build confidence by progressing slowly and allowing yourself sufficient time to adapt to challenges. This also applies to static and depth disciplines. Try not to go further until the distance you are currently achieving feels very comfortable and easy. When you feel confident in your current achievements, progress slowly, in small, incremental steps. Repeat diving to the same distance until it becomes easy before going further. For example, if you are confident in dynamic swims to 25m/80ft. and can achieve this distance repeatedly and fluidly with no problems and the dive feels easy, add a turn at the end. Progress a little at a time. This way you can remain relaxed and diving safely, as you have great confidence in your current abilities.

Remember, if you haven't dived for a while, or you are feeling under the weather or recovering from an illness, then you cannot expect to start where you left off.

It is far better to surface from a dive thinking it was really easy and fun, rather than thinking it was difficult and feeling on the edge of a hypoxic episode.

If you have meaningless (i.e. not relevant to an actual physical problem) negative thoughts during a dynamic swim, you can use a focus point to overcome this negative intrusion. For example, focusing on your technique or visualizing an upcoming turn. Remember to keep your finning / stroke steady throughout the dive, and don't rush for the end of the pool, as this will use more energy and oxygen. You can count your fin strokes as a distractive technique and focus on keeping a steady pace.

Find your own positive focus point and start to use this if you experience unnecessary negative thoughts while freediving.

Only ever train in water with a qualified and experienced buddy with you at all times

To recap on how to perform a dynamic apnea dive / swim:

- Check your buoyancy at the start of the session.
- Relaxation breathing in a position comfortable for you. Take your pre-dive breath and perform a modified duck dive to get under the water. Try to relax your body and mind.

BUDDYING FOR DYNAMIC APNEA

- You may experience a number of thoughts and sensations during your breath hold. Acknowledge these, but don't focus on them.
- Use visualization techniques to picture your dynamic apnea swim in minute detail.
- Perform the correct technique for the swim. If you are performing dynamic bi-fins, use the flutter kick, ensuring the same forward and backward stroke, and a slow, large amplitude fin kick. If you are performing a dynamic no fins swim, remember to glide in between arm strokes and leg kicks. Make sure your head is in a relaxed position, neck following the line of the spine, and you are not craning your neck and lifting your head to look ahead.
- When you want to end your swim, come directly to the surface and use either the pool edge, surface lane markers, pool float, or your buddy's arm for support.
- Lift your face completely clear of the water. Look at your buddy and perform recovery breaths. A minimum of 3 or 4 recovery breaths is mandatory, more if required. When you are fully recovered, give the OK signal to your buddy and verbally communicate that you are OK.

Correct technique for both dynamic with bi fins and dynamic no fins is vital. Your awareness of where you are in the water column is equally important. Try to maintain the same horizontal plane through your entire dynamic swim, even though the pool might be getting deeper. Tuck your head in and streamline your body. If you can see where you are going, then your head is raised, and your back is arched. By maintaining a streamlined position with your head, arms and legs in line, you will be more hydrodynamic and minimize drag through the water.

Spend time refining your technique and try not to worry about covering distance until you've got the technique perfected.

BUDDYING FOR DYNAMIC APNEA

Your job as a buddy is to supervise the dynamic session, helping your buddy through the entire session, and ensuring they are safe and in control at all times. This starts right from the start of the session, from helping them relax, communicating with them, and supporting them both mentally and physically.

RAID NOTE: Establish what your buddy wants from you at the beginning of the session – don't second guess them. Establish what the aim of the session is. Does your buddy want to practice turns? Are they likely to come up at the end of the pool, or mid-length? Have the conversation before you start.

Let's walk through a typical dynamic session and identify the buddy role at each stage.

Before your dive, you and your buddy should discuss your plans for the swim. If you are intending to swim a single length, let them know this. If you are planning to turn in the pool and continue the swim, make sure your buddy knows this. Make a plan, and then stick to the plan*. If you have already planned to end your swim at the end of the pool and you then turn, your buddy may be positioned incorrectly to react immediately.

***It is worth mentioning here that if you plan for specific length, but find the dive is difficult, too far, or just doesn't feel right, don't continue.**

BEFORE THE DYNAMIC SWIM

Make sure you know the plan. Establish where you will be swimming during the dive and get into position. Give the diver sufficient room to start their swim.

RAID NOTE: As a buddy, you will always be equipped with a mask, snorkel and bi-fins, even if the diver is performing dynamic no fins. You **never** buddy in a monofin, or without fins.

In competition

If you decide to compete in the dynamic apnea discipline, each governing body will have their own set of rules about timings for dynamic apnea dives. You will be given a count-down and then typically an “official top” (OT) time (the time at which your dive should start). You will have a window (typically 10 seconds but check with the organizers) after your OT in which to start the swim. If you start before the OT, or after the window, you will likely receive a penalty or possibly a disqualification.

As the buddy, you will not be wearing a weight belt, and will be swimming on the surface of the water at all times, unless you are rescuing a diver from under water.

You may want to position yourself a few meters ahead of the diver. They are unlikely to need your assistance in the first 5 to 10m (15 to 33ft.) of their swim, so if you position yourself ahead of them, you not only give them ample room to start their dive, but you give yourself a “head-start”. It is better to be waiting for a diver to reach your position at the start of a dive than be chasing them from the very beginning.

DURING THE DYNAMIC SWIM

You will be swimming on the surface alongside your buddy, with your face in the water, and breathing through your snorkel. You should be no further than 1.5m/5ft. from the diver for at least the last third of their swim. You may want to position yourself slightly ahead or slightly behind the diver, to one side, but always within reaching distance, should you need to perform a rescue.

If the diver is planning to turn at the pool end, stop your surface swim a short distance from the end to give them room to make the turn. If you continue all the way to the end of the pool, not only do you have to turn yourself to face the opposite distance next to the wall, wearing fins, but you may also impede the diver’s turn with your fins being in the way.



RAID NOTE: Sometimes, a diver may be so focused on their swim, their technique, position in the water and so on that they forget they are approaching the end of the pool. It is not unheard of for divers to swim straight into the wall during a dynamic apnea swim. As a buddy, watch the diver carefully as they approach the end of the pool. If they don’t look like they are either going to stop at the end, or perform a turn, try to stop them hitting the pool wall.

Monitoring diver behavior

During the swim, you will be watching the diver and closely monitoring them. As a buddy, there are a number of signs we need to look out for throughout the dynamic apnea swim. Watch out for the diver’s fin stroke speeding up, shaking, shivering, parts of the body tensing up, air escaping through the airway, etc. Essentially, anything different from normal could signal hypoxia, and if you see any change in behavior of the diver or any abnormal behavior, you must assume they are experiencing a hypoxic event and end the dive.

If you see any air escaping the airway, this is a sign of a blackout, and you must rescue the diver immediately. See the section on rescue later in this manual.

AT THE END OF THE DYNAMIC SWIM

When you see your buddy surfacing, move close to them, placing one hand under their armpit and positioning yourself so that you can closely monitor their recovery breathing and check for signs of hypoxia. If you are near a pool edge, direct the diver to the side /

CONSTRUCTING A DYNAMIC PRACTICE SESSION

end of the pool and encourage them to use the pool edge for support. If there is no pool edge, you might use a surface lane marker, pool float, or your arm for them to hold on to for support.

Make sure the diver brings their face up out of the water with good clearance between their face and the water. They shouldn't be looking down with their mouth barely out of the water. Ensure that they are looking at you and encourage / coach them through their recovery breaths. Monitor their condition – are their eyes focused and looking at you, or are they glazed over and unfocused? What color are their lips? As a buddy, we are looking for signs of hypoxia. Very pale lips or very blue / purple lips and unfocused eyes can be good indicators of hypoxia.

Make sure the diver is performing recovery breaths correctly. If they are not, perform recovery breaths yourself, and ask them to copy you. If you suspect that the diver is hypoxic, have them repeat proper recovery breaths until they are recovered. 3 to 4 recovery breaths is the absolute minimum after any breath hold, and the diver may need to do more, so coach them through this process.

There may be a temptation from the diver to push their limits as they feel are in a safe environment, but as with all aspects of freediving, progression should be incremental, measured and safe. You want the diver to feel safe, but you don't want them to adopt a blasé attitude. There is a subtle balance between feeling confident and having trust in your buddy, to adopting a nonchalant, carefree approach, thinking that if you suffer a hypoxic episode, it doesn't matter, as your buddy is there to sort it out.

In competition

There will be an established surface protocol for ending a dynamic apnea swim during competition, and this may vary slightly depending on the organizers. You can expect that a number of tasks will need to be completed in a particular order within a given timeframe, for example:

- removal of all equipment covering the eyes and / or airways (e.g. mask, goggles, nose-clip etc)
- a visible OK signal, that is visible to the judge(s)
- a verbal OK signal to the judge(s)

At the end of the swim, the buddy is not allowed to touch the diver or coach them through their surface protocol. Each organization may have slightly different requirements, so make sure you know what is expected.

IMPORTANT : It may be tempting to start asking the diver how they are feeling, or even congratulating them if they have achieved a personal best. But you must resist – don't ask any questions or strike up a conversation with your buddy until they have completed recovery breaths and are fully recovered from the dive. If your buddy is hypoxic after a dive and starts to talk without having completed sufficient recovery breaths, they may experience a blackout.

FAMILIARITY AND ROUTINE

The discipline of dynamic apnea can be challenging, especially if you are in a crowded, busy, noisy pool. It is important to relax, no matter what the circumstances are. You might be in a public swimming pool, with lots of distractions, like kids playing and yelling, lots of noise and splashing. If you can establish a set routine, so that each part of your dynamic practice becomes familiar, in spite of distractions, it will make it easier for you to relax. A set routine, and familiarity with that routine, and with the feelings and sensations you may experience, will also help in new locations, a new swimming pool, for example. Don't under-estimate the value of repetition, routine and familiarity. It will make your session easier and improve performance.

CONSTRUCTING A DYNAMIC PRACTICE SESSION

There are many techniques we can use when practicing dynamic apnea.

Some of the techniques you could use during your dynamic session are covered below.

STARTING OUT

At the start of every session, take some time to get your buoyancy right. We discussed how to do this earlier in the manual. As a quick recap, perform your normal pre-dive breath, bend down in the water, push off, and glide. Don't move your arms or legs at all. You should remain under the water for at least two-thirds of the glide, neither sinking, not floating.

If you are training dynamic no fins, once you've established your buoyancy, the next thing to work on is streamlining. At the edge of the pool, take a pre-dive breath, and push off and glide underwater. This is best done without fins, so you can use the pool edge to push against with your feet. Continue the glide until you come to a stop in the water. Surface and place a marker on the pool edge to signify how far you traveled with just a glide. Repeat this and try to improve on your distance. The more streamlined you are, the more it will increase the distance traveled. Once you have established good streamlining, add an arm pull, glide, frog-leg kick, glide to this and note how far you travel in the pool. Try to improve on this and see just how far you can get on a single arm pull and a single leg kick. Top level dynamic no fins freedivers will often require only 2 or 3 strokes for a 25m/80ft. length. If you can swim 25m/80ft. with no fins, count how many strokes you take. Keep a note of this and try to improve on your performance by decreasing the number of strokes needed.

When working on dynamic bi-fins technique, count your fin strokes and time your distance for a 25m/80ft. swim. You can ask your buddy to help with this, as often you may forget to count! As a rough guide, a 25m/80ft. dynamic bi-fins swim should take between 25 and 30 seconds, with between 19 and 22 fin strokes. If you are using more strokes, or completing the distance in less time, try to focus on your finning technique and pacing. Aim for a slow, steady pace.

Some freedivers feel that a dolphin kick / monofin finning kick when the legs are together feels more natural than the flutter kick and assume that it is more effective / efficient. Certainly, good monofin technique while wearing a monofin can be much more efficient. However, monofin stroke / dolphin kick does not make a significant difference when wearing bi-fins. You can compare this by counting your fin strokes and speed over the same distance.

Make a note of the time taken and fin strokes needed to swim 25m/80ft. using the flutter kick. Then do the same with a dolphin kick while wearing bi-fins. There is likely no discernable difference between the two. If you prefer the monofin kick / stroke, there is a Monofin Freediver Specialty course within the RAID Freediving program. Ask your instructor for details.

Use the start of the session to establish what feels right for you, how you start and end your swim, your buoyancy, streamlining and how to work with your buddy. This is not a time to push your limits or see what your maximum dynamic swim is. We are simply getting used to the feelings and sensations we have and practicing with our buddy.

Now that we have learned what dynamic apnea feels like, what can we do to progress during our practice sessions? There are many schools of thought about how to increase apnea performance – some people put themselves under stress and have contractions during every dynamic apnea swim. However, there are many other people who adopt a much more relaxed approach, and these people can build up a phenomenal performance in every discipline with little to no stress, and without ever becoming uncomfortable. In summary, you don't have to feel uncomfortable, stressed, or "on the edge" to progress during your training.

There are many ways to train for dynamic apnea. The following sections detail some of the commonly used approaches.





CO₂ TRAINING TABLES

This first training method is performed as a static discipline – i.e. not moving. The purpose of CO₂ training tables is to train the body to deal with the effects of CO₂ build-up in the body that typically occurs during a breath hold. As we know, the primary trigger for the body's urge to breathe is rising CO₂ levels. With regular practice, you can train your body and mind to remain calm and delay the urge to breathe even as CO₂ levels rise.

CO₂ tables work by repeating a defined duration of breath hold with shortening recovery intervals between breath holds, preventing full expulsion of CO₂, which allows its gradual build-up in the body.

The duration of breath hold for CO₂ tables is typically around 60% of your maximum breath hold duration. Start with an easily achievable breath hold duration and give yourself a reasonable period of recovery time after the first hold. The breath hold is then repeated for the same duration, but the recovery time is decreased by 15 seconds. Continue this cycle of the same duration for breath hold, and each cycle reduce your recovery time by a further 15 seconds.

Let's look at an example. Imagine your maximum breath hold is 2 minutes 30 seconds. 60% of this is 1 minute 30 seconds. A typical CO₂ table for this freediver might look like this:

EXAMPLE CO ₂ TABLE (full breath hold)		
Set	Breathe	Apnea (Breath hold)
1	-	1:30 mins
2	2:00 mins	1:30 mins
3	1:45 mins	1:30 mins

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4	1:30 mins	1:30 mins
5	1:15 mins	1:30 mins
6	1:00 mins	1:30 mins
7	0:45 mins	1:30 mins
8	0:30 mins	1:30 mins

If the above table is too difficult, then the last recovery time can be one minute. If it is too easy, the last recovery time can be fifteen seconds.

These tables can be performed dry (at home or by the side of the pool), or in water with a trained buddy. There is a separate Static Apnea Specialty course that goes into more detail about this and other techniques. But CO₂ tables can be used effectively to train for dynamic apnea.

CO₂ tables can be modified for dynamic apnea swims in a number of ways, and we are going to cover two different approaches to dynamic CO₂ tables in this course.

The first approach is to reduce the recovery interval between a series of short dynamic swims. You would start with normal relaxation breathing, followed by a 25m dynamic apnea swim.

Give yourself a reasonable period of recovery time after the first hold, in the example below, 1 minute, 15 seconds. Perform another 25m/80ft. dynamic apnea swim but reduce the recovery time by 15 seconds. Continue this cycle of a 25m swim followed by a recovery interval, reducing your recovery time each cycle by 15 seconds.

In the table below, set 5 and 6 both have a recovery time of 30 seconds, and set 7 and 8 both have a 15 second recovery interval. This is an example, and you can develop your own CO₂ table that works for you.

One thing to remember when designing your own practice is that you shouldn't set your first recovery interval too low, or you won't be able to reduce it. For example, if your recovery period after set 1 was 30 seconds, your next recovery would be 15 seconds, and the one after would be zero.

EXAMPLE DYNAMIC CO₂ TABLE, timed breath in between swims		
Set	Breathe	Dynamic swim distance
1	-	25m/80ft.
2	1:15 mins	25m/80ft.
3	1:00 mins	25m/80ft.
4	0:45 mins	25m/80ft.
5	0:30 mins	25m/80ft.

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6	0:30 mins	25m/80ft.
7	0:15 mins	25m/80ft.
8	0:15 mins	25m/80ft.

A different way to measure the recovery interval in between swims is to count the number of breaths, rather than the duration. In the next example, we start with a 25m/80ft. dynamic swim followed by a recovery period of 12 breaths (this includes your normal recovery “hook” breaths). The next swim is the same distance, but the recovery interval is reduced by 1 breath to 11. Each cycle reduces the number of breaths in between swims by 1. As with the previous example, don’t start with too few breaths in your first recovery interval. For example, if you started on 6 breaths, then 5, 4, 3, 2, 1, then you have NO recovery period in between cycle 7 and 8, meaning you are effectively doing a 50m/165ft. dynamic swim.

EXAMPLE DYNAMIC CO₂ TABLE, number of breaths in between swims		
Set	Breathe	Dynamic swim distance
1	-	25m/80ft.
2	12 breaths	25m/80ft.
3	11 breaths	25m/80ft.
4	10 breaths	25m/80ft.
5	9 breaths	25m/80ft.
6	8 breaths	25m/80ft.
7	7 breaths	25m/80ft.
8	6 breaths	25m/80ft.

The second approach we are covering in this course is pyramid breathing. Where the previous examples showed the recovery breathing interval reducing each set, or cycle, pyramid breathing reduces the recovery interval to a mid-way point, and then increases again towards the end. This means that the “hardest” swim will be in the middle of your set, and not at the end, like the previous examples.

As before, you start with relaxation breathing as normal, followed by a 25m/80ft. dynamic swim. On surfacing, you have a 1-minute recovery interval, including your recovery breaths. Perform another 25m/80ft. dynamic swim and reduce the recovery interval by 15 seconds to 45 seconds. Repeat, reducing the recovery time by 15 seconds each cycle, until you come to the mid-way point in your table (for an 8-cycle table, the mid-point will be between cycle 4 and 5). The interval at this point should be the shortest of the table. After your next swim, increase your recovery breathing interval by 15 seconds. Repeat, increasing the recovery time by 15 seconds each time. Our example is shown in the following table.

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1. EXAMPLE PYRAMID DYNAMIC CO₂ TABLE, timed breath in between swims		
Set	Breathe	Dynamic swim distance
1	-	25m/80ft.
2	1:00 mins	25m/80ft.
3	0:45 mins	25m/80ft.
4	0:30 mins	25m/80ft.
5	0:15 mins	25m/80ft.
6	0:30 mins	25m/80ft.
7	0:45 mins	25m/80ft.
8	1:00 mins	25m/80ft.

Pyramid breathing CO₂ tables can also be performed with a number of breaths in between each cycle, rather than timing. In the example below, we start with 8 breaths in between swims, and then reduce this to 7, 6 and 5, with 5 being the mid-point. This includes your recovery “hook” breaths. From the mid-way point, we increase the number of breaths between each swim. The next cycle will be 6 breaths, then 7 and finally 8 before your last set.

2. EXAMPLE PYRAMID DYNAMIC CO₂ TABLE, number of breaths in between swims		
Set	Breathe	Dynamic swim distance
1	-	25m/80ft.
2	8 breaths	25m/80ft.
3	7 breaths	25m/80ft.
4	6 breaths	25m/80ft.
5	5 breaths	25m/80ft.
6	6 breaths	25m/80ft.
7	7 breaths	25m/80ft.

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8	8 breaths	25m/80ft.
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PRO-TIP: Use hook breathing for your breaths in between swims. Hold the pause in these recovery breaths longer than you normally would.

The thing to remember with dynamic CO₂ tables is that the distance remains constant throughout the entire set. Only the duration of recovery in between swims changes – either reducing consistently, or reducing and then increasing again, as in the pyramid examples above.

IMPORTANT: As with all dynamic apnea swims, your buddy should swim alongside you on the surface throughout these CO₂ tables. Never dive alone.

IMPROVING DISTANCE

When you are working towards increasing your distance, it is advisable to factor a turn into your swim. Turns are difficult and many divers try to avoid making them. If you are practicing 25m/80ft., then do 25m/80ft. plus a turn. When this is comfortable, do 25m/80ft. plus 2 fin strokes. Increase in this way until you get to 50m/165ft. Then practice 50m/165ft. plus a turn.

If your plan during a session is to try for a personal best, unlike static apnea, you don't perform a series of breath holds, or in this case, swims, before you perform your attempt. You will want to warm up, and typically one 25m/80ft. swim will be enough to warm up the muscles and prepare you for your maximum attempt.



If you perform a series of longer swims in order to warm up for a maximum distance attempt, you are likely to tire yourself out and fatigue the muscles. Lactic acid will build up in your muscles and impair your performance.

For example, if you are aiming for a 50m/165ft. dynamic swim with bi-fins, you would not do 3 warm-up dives of 45m/145ft. Do one or two 25m/80ft. warm-up swims, then perform your 50m/165m swim, while your muscles are still fresh and not fatigued.

It's likely that if you are starting out, or are a more experienced depth freediver with little dynamic apnea experience, then you won't know what your limits are in dynamic. You don't want to push to a point where you have a hypoxic episode when finding out what your maximum dynamic swim distance is, so when establishing your approach to a dynamic apnea session, it is **critically important to work with an instructor** who can more easily tell signs of hypoxia.

IMPORTANT: Your maximum dynamic apnea swim should not be to the point of hypoxia!

It is also possible to prepare for a dynamic session outside of the water on the side of the pool, for example breathing exercises or short breath holds. Some people may prefer this, rather than the whole session to be conducted in the water.

Static followed by dynamic

Another way to train and improve your performance is to add a short static breath hold at the start of your dynamic swim. You will start in the same way, perform your pre-dive breath but instead of pushing away from the side (no fins), or duck-diving (with fins), you

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simply lie down in the water, face down and remain still for a short, pre-defined period of time, before beginning your swim. Your buddy will need to time your static and let you know when to begin your swim. Before the swim, establish with your buddy:

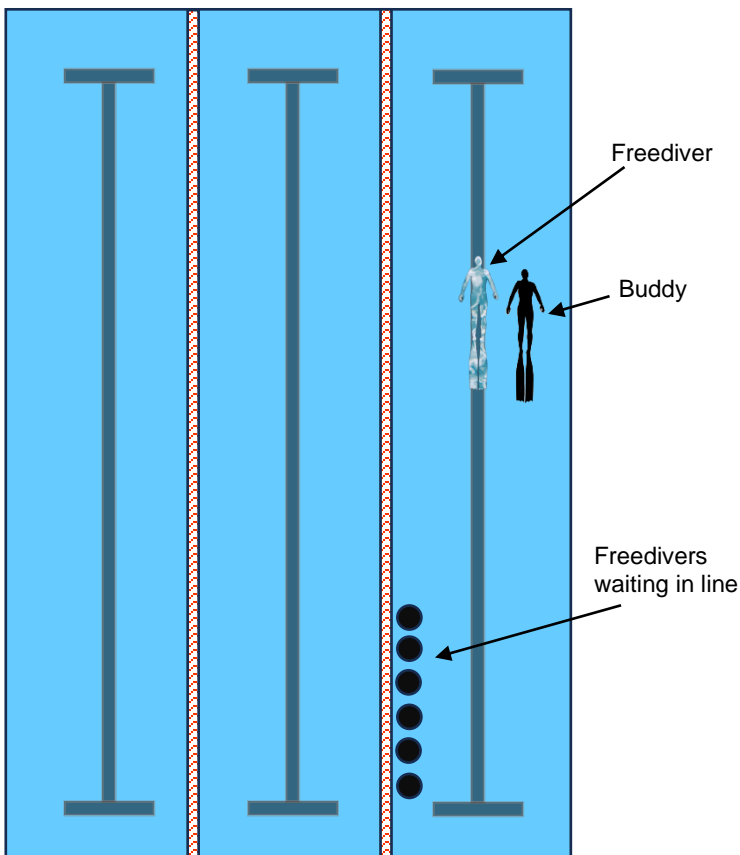
- The length of static breath hold at the start of the dive
- The signal they will use to let you know that the time has elapsed, and you should start your swim
- The planned distance of your swim, including whether you are planning a turn at the end of the pool, or stopping at the end of the length
- Any other relevant information, for instance coaching, or time checks during your static

There are 3 ways to add a static hold to your dynamic swim.

1. A static breath hold followed by a dynamic swim.
 - For example, a 30 second static, followed by a 25m/80ft. dynamic swim.
2. A dynamic swim, followed by a static breath hold.
 - For example, a 25m dynamic swim, followed by a 30 second static breath hold
3. A static breath hold, followed by a dynamic swim, followed by a second shorter static breath hold.
 - For example, a 30 second static breath hold, followed by a 25m dynamic swim, then a 15 second static breath hold.

In all the above examples, you do not lift your face from the water in between transition from static to dynamic or vice versa. You are holding your breath for the entire activity.

Even if you have discussed a defined distance for your dynamic swim, always come up when you feel you need to. Don't push it just to reach a target. Extending your breath hold beyond an urgent feeling to end the swim will cause stress and may lead to a hypoxic episode.



LANE ETIQUETTE

An important consideration during a dynamic apnea session is how to use the lane(s). You may be lucky in that you and your buddy have a lane to yourself, but it is more likely that in a club, teaching or training environment, you will be sharing the lane with other freedivers.

You will normally be performing your dynamic swim one at a time, with your buddy swimming alongside at the surface. All of the other divers should be positioned to one side of the lane, so they do not hinder either the diver or the buddy. When you have performed your swim, join the back of the queue. If you have ended the dive at the opposite end of the swimming pool, swim back along the surface, not underwater, and swim to the side of the lane so you do not get in the way of either the next dive or their buddy.

Use the time in the queue to do your relaxation, pre-dive breathing. Nobody is going to thank you if you've spent 5 minutes in the queue, only for you then to spend 2 minutes doing

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your relaxation breathing when it's your turn. You may be limited in the time allowed in the pool, so make best use of that time, and try not to hold the session up and delay other divers.

When performing your swim, keep your chin tucked in so that your head is in line with your body – look at the lane markers and follow them. Typically, a lane marker on the bottom of the pool will be located centrally in the lane, so don't veer off course and end up in a different lane.

How you manage a dynamic pool session very much depends on how many lanes you have and how many divers. Your instructor will manage the session, so pay attention to them, and follow instructions as to where you should queue, swim and buddy.

GAMES TO PLAY DURING DYNAMIC APNEA SESSIONS

Dynamic apnea sessions don't have to be boring. You can play games in order to train for dynamic. There are many games, a few of these are listed below.

1. Slowest swim to 25m/80ft. With someone recording the time taken, each diver will perform a 25m dynamic swim as slowly as they possibly can.
2. Fastest swim to 25m/80ft. Again, a timed swim. Each diver takes it in turn to swim as fast as they can for one length and compare times.
3. Rope race. If it is possible to fix ropes under water the length of the lane, using only arms, pull along the rope. When you get to the end, you can swim back either underwater (with or without fins) or on the surface depending on your breath hold ability. This can either be a controlled slow pull along the line, or a timed race between divers.
4. With no fins, and a pool float, swim a length on the surface only using the frog-leg kick. Take a breath every 2 kicks. On your next length, take a breath every 3 kicks, then every 4 kicks and so on.
5. Again, with no fins, swim a length on the surface now using arm pull and leg kick. Take a breath every 2 strokes. On the next length, take a breath every 3 strokes, then every 4 strokes and so on.

Your instructor may have other games you can add to your dynamic breath hold sessions, which you can discuss during your confined water sessions.

RECOVERY TIME BETWEEN DIVES

How long you will need to recover between dives is largely dependent on the duration of the breath hold, and the distance traveled. A good rule of thumb is to recover for the breath hold duration plus 1 minute. For example:

Apnea duration	Recovery / relaxation breathing duration before next dynamic swim
1:00 mins	2:00 mins
2:00 mins	3:00 mins
3:00 mins	4:00 mins
4:00 mins	5:00 mins

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and so on...

In a pool with other divers, it is likely that your recovery times will be longer than this.

IMPORTANT: Never dive alone – always dive with a trained buddy

Keep a log book, detailing each practice session. Include details of the series of swims you performed, what worked well, and what didn't go so well for you. If you tried a particular technique that worked well for you, make a note of it. Record the environmental factors, location, water temperature, any significant distractions you noticed.

Keeping a log book is a great way of recording practice sessions, and the more information you record, the more useful it will be when referring back. You can keep an eye on your progress between sessions and compare different techniques between sessions.

Your buddy is a vital part of your dive. Having an attentive, helpful buddy can make the difference between a frustrating session, where you never felt quite in control or confident, to an enjoyable progressive practice, where your buddy helped you to achieve better technique and/or a personal best.

RAID NOTE: You can train comfortably without putting yourself under any stress and still progress. Training doesn't have to be unpleasant, difficult, or uncomfortable.

There is no specific performance requirement for this course in terms of a dynamic apnea swim distance. However, if you intend to use this course to replace the dynamic apnea performance requirement in either the Advanced or Master Freediver course, the requirements for dynamic apnea distance are shown in the table below.

RAID Course	Dynamic discipline	Dynamic apnea performance requirement (minimum)
Advanced Freediver	Dynamic bi-fins (DYNB)	55m/180ft.
	Dynamic no fins (DNF)	No minimum distance, correct technique only
Master Freediver	Dynamic bi-fins (DYNB)	75m/246ft.
	Dynamic no fins (DNF)	50m/165ft.

HYPOXIA, BLACKOUTS AND RESCUE – QUICK REVIEW

If you've already completed the Open Water Freediver certification, or Foundation Freediver certification, or completed the Try Freediving course, you may remember that we learned about hypoxic fits and blackouts. In your confined water training for this dynamic apnea specialty course, you will have rescue scenarios to complete, so let's do a quick review of the terms and rescue techniques.

WHAT IS HYPOXIA?

The human body has a limited supply of oxygen. Most of this supply is carried in our oxygenated arterial blood. If we push our freediving too close to, or past the limit of our oxygen supplies (hypoxia), it is possible to experience a low oxygen related situation. Hypoxia

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occurs when there is a deficiency in the amount of oxygen available for our tissues. Signs of hypoxia become obvious when the arterial oxygen tension drops below the critical threshold.

1. Hypoxic fit (HF)

- A hypoxic fit is a loss of motor control caused by a lack of oxygen to the brain. Severity ranges from almost unnoticeable tremors in the hands to whole body convulsions.
- After a severe hypoxic fit, a diver may be disoriented and usually has no recollection of what happened. Hypoxic fits normally resolve on their own with the assistance of a safety diver, however severe hypoxic fits can progress to a blackout. Without assistance, the diver is at risk of drowning.
- Hypoxic fits normally occur immediately after a diver has surfaced.

2. Blackout (BO)

- All breath hold related loss-of-consciousness has the same basic cause - lack of oxygen to the brain.
- When oxygen levels fall below the threshold required to maintain consciousness, a blackout occurs. This is the body's way of protecting critical brain tissue by reducing the brain's demand for O₂.
- The dynamics that contribute to this happening vary with depth. In freediving, we categorize blackouts according to the depths at which they occur; underwater, or surface.

The level of oxygen in the blood which is required to maintain consciousness is around 10%, or a partial pressure (ppO₂) of 0.10. However, a blackout is likely to occur at around a ppO₂ of 0.12, and hypoxic fit at a ppO₂ of 0.16.

Let's imagine a dynamic breath hold where you are comfortable and confident, and wanting to achieve a personal best. Your maximum dynamic apnea swim in water to date is 25m, but you've been doing a lot of breath hold practice by way of dry-training and are looking to achieve 50m. You've had a recent illness, but before this you were achieving 25m with ease.

You start your swim and feel pretty confident. Your buddy knows you well and you trust them. This gives you a false sense of security, and you push your limits. You are not fully recovered from your illness, and this has a detrimental effect on your ability in this session. You reach 25m, the pool end, perform the turn inefficiently, lose momentum and start to swim back down the pool. You look for the end of the pool, and it's still a long way, so you speed up to get there quicker, using more oxygen. Your ppO₂ drops to 0.12 bar. You lose consciousness and your buddy rescues you.

Hypoxia Threshold (Low ppO ₂)		
ppO ₂	0.21	Normal PpO ₂
ppO ₂	0.16	Hypoxic Fit
ppO ₂	0.12	Blackout likely
ppO ₂	0.10	Minimum to sustain consciousness

WHY DOES IT HAPPEN?

The simple answer is that we all have a limit. Staying within this limit is one of the skills of freediving successfully. If we push too far, too long or hyperventilate before diving, we can exceed our limit and have a possible blackout. The human body has an amazing

HYPOXIA, BLACKOUTS AND RESCUE – QUICK REVIEW

protective feature when we are freediving if our O₂ limit is reached. As the O₂ level drops to a ppO₂ of around 0.10, the brain switches off to preserve the remaining oxygen well before it is completely exhausted.

Other physiological manifestations happen at this point too: the throat/larynx will spasm and create a seal to prevent water entering the lungs. In the past, this has been explained as dry drowning. The laryngospasm will only last a short while and affords a window of opportunity to rescue a freediver from the water – hence why it is so important to freedive with a buddy.

RAID NOTE: Your performance may change daily – it is dependent on many factors: how much sleep you had, how hydrated you are, what you've eaten, stress factors in your life, illness, even your surroundings, perhaps a very noisy pool, or unfamiliar buddy. Don't assume that what was an easy dive one day will be easily achievable the next. Do what feels comfortable and don't push your limits.

Most cases of O₂ level drop in dynamic breath holds are caused by freedivers hyperventilating before a dive, or swimming too far, too quickly, in their freediving. Taking a more relaxed, consistent progression to freediving will afford you far more enjoyment, progress and safety.

IMPORTANT: You may hear people say that having a hypoxic fit or blackout is a way of discovering your limits – this is not true. You are not discovering your limits; you are vastly exceeding them!

SIGNS AND SYMPTOMS

Symptoms range from looking a little pale or feeling low in energy to a complete loss of consciousness. The following section describes how to recognize symptoms of hypoxia in yourself and others, and signs of a blackout during a dynamic swim.

General signs of hypoxia include:

- Trembling
- Shaking
- Jerky head movements
- Inability to control the body
- Inability to keep the head above the water after surfacing
- A glazed look
- Reduced responsiveness
- Confusion
- Slurred words or inability to speak
- Blue lips (cyanosis)

IMPORTANT: After experiencing a hypoxic fit, a diver's energy reserves are exhausted. They should stop diving for the day (24hrs) and, if possible, should breathe pure O₂ for 5 to 15 minutes.

Things to look out for during a dynamic apnea swim include:

HYPOXIA, BLACKOUTS AND RESCUE – QUICK REVIEW

- Freediver behaving abnormally – for example, moving, tensing, shaking. Anything unusual about the freediver's behavior can indicate a hypoxic episode or the onset of a blackout.
- Freediver speeding up during their dynamic apnea swim.
- Exhaling air – as the freediver loses motor control, they lose the ability to hold the air in the lungs, and air can escape through the mouth. This may coincide with the rhythm of the contractions from the urge to breathe.
- Loss of consciousness. This can be a sudden change or a gradual one as the O₂ level decreases.

IMPORTANT: Staying alert and keeping an eye on your buddy for any of these signs is imperative.

HOW TO AVOID HYPOXIA AND BLACKOUT

The good news is that blackouts and hypoxic fits are rare and easy to avoid. By never hyperventilating and simply taking a relaxed progression to time in your dynamic apnea freediving, you can successfully freedive without ever experiencing a hypoxic event. Do not progress your freediving until your past efforts feel easy. For example, if you are very comfortable with a dynamic swim to 25m, then it is a good time to progress, but only a small amount at a time. For example, 25m and add a turn. If a dynamic swim feels difficult, then it is unwise to progress further, as you are at greater risk of hypoxic fit or blackout. Have fun with your freediving and keep it drama free.

Freediving becomes easier the more we do it and, in fact, your progression will be far more successful by avoiding hypoxic events.

Practical steps to avoiding a Hypoxic fit / Blackout

1. Do not push your limits. Only progress when you feel very comfortable at a certain time, and then only progress conservatively.
2. Wear proper freediving equipment that fits correctly, including form fitting suit, low-volume mask, or goggles with nose-clip, freediving fins and correct weighting for dynamic. These will help you conserve oxygen and, alongside being relaxed and comfortable, enable you to use less O₂.
3. Progress conservatively. Make sure your previous distance was an easy success before you go further. If your previous dive was difficult, then it is a fast way to failure by trying to push further.
4. Avoid over breathing / hyperventilating. Taking too many large breaths will turn your blood pH alkaline. In this state, the bond between hemoglobin and oxygen becomes very strong (the Bohr effect) and the oxygen will not be released from the red blood cells to the tissues where it is needed. This can cause hypoxia.

RAID PRO-TIP: If you find before a freediving session that you do not feel great, perfect or in good condition for a freediving performance, don't hesitate to abort your session. There could be many reasons for feeling unwell, such as being cold, tired or sick. You will find you may use more oxygen than you normally would, so wait until next time to challenge your time, distance, or depth.

HOW TO MANAGE A HYPOXIC FIT OR BLACKOUT

The response to any hypoxic event, regardless of depth, is the same. There are 3 main parts to a rescue.

- **RESCUE** – Bring the freediver to the surface. Keep them securely on the surface with their airways out of the water.
- **RESPONSE** – Remove any facial equipment.

Summary

- For a hypoxic, conscious diver, clearly and firmly coach the freediver through their recovery breathing. People can appear angry and aggressive when hypoxic. It's not personal and is part of the body's defense mechanism. It is likely that they will have no recollection of this after the hypoxic episode when they are fully recovered.
- For an unconscious diver, blow air across the eyes and cheeks. Gently tap the face. Loudly instruct the freediver to breathe, using their name.
- **REVIVE** – Unconscious diver - if the freediver remains unresponsive after thirty seconds, begin rescue breaths. If they do not revive within another minute, call for help, remove from the water and commence CPR.

RAID PRO-TIP: If a freediver experiences a hypoxic fit, you can support the freediver until they regain complete composure, but be ready to initiate Rescue, Response, Revive, as a hypoxic fit can be followed by blackout. After a hypoxic fit, check the freediver for injury. If a hypoxic fit occurs in a pool, they may have hurt themselves or another diver through contact with the pool-side.

When performing a rescue when the diver is underwater, the first priority is to bring them to the surface. Place one hand with the heel of your hand on the chin and the fingers lightly pressing on the mask. This hand should keep the mouth closed to protect the airway and prevent the mask from coming off as come to the surface. Place the other hand on the back of the diver's head. This will help you control the body during surfacing. You do not need to pinch their nose or hold the mask tightly.

The arm of the hand that is covering their airways should be **under the diver's arm from behind**. This sets you up nicely for the procedure we follow at the surface.

Remember that the diver's airway should be supported securely out of the water. As the rescuer, one arm should be supporting the diver under their armpit with your hand on the diver's chin in a pistol-grip. The diver's head should rest on your shoulder, clear of the surface of the water. With your other hand, you can remove facial equipment, e.g. mask, and gently tap the diver's face.

Your instructor will remind you of the rescue steps during your pool sessions, and you will practice rescues scenarios from both simulated hypoxic fit and blackout.



SUMMARY

The discipline of dynamic apnea can be a lot of fun, and a fantastic social activity. It's important to relax no matter what the circumstances are, and to build a routine so that everything becomes familiar, almost second-nature. Familiarization is particularly useful for dynamic sessions. It can make it easier for you to relax, even if there are distractions or you are in an unfamiliar place, such as a new pool location. There can be many distractions during a dynamic session, for example other people using a public swimming pool, children, other classes going on and so on. If you can learn to relax and focus your mind elsewhere, you can shut out all the external distractions.

CONCLUSION

Having said all this, it is possible to perform long dynamic apnea swims with zero preparation if you are very relaxed. There's no one definitive way to complete a dynamic apnea session. Be prepared to experiment with different approaches during your sessions, and see what works for you and your buddy.

A final word on safety during dynamic apnea. You are more likely to push your limits in a pool, as you may have a false sense of security. You are in relatively shallow water, generally not out of your depth, and can stand up easily with your airways out of the water. The visibility, if you are in a pool, is likely to be fairly good, so you can see the bottom of the pool and your buddy right next to you. It's important to do what feels good on the day. Don't go for a target distance unless you are properly prepared, and it is achievable. Also remember that your performance will change daily, depending on numerous factors, for example, how much sleep you've had, whether you've had a good or bad day at work, how hydrated you are and so on.

RAID PRO TIP: You can still progress to world-class levels without ever experiencing stress, contractions or any feelings of discomfort. You don't need to stress your body or mind during the process of dynamic apnea.

We look forward to seeing you in the pool for your dynamic session!

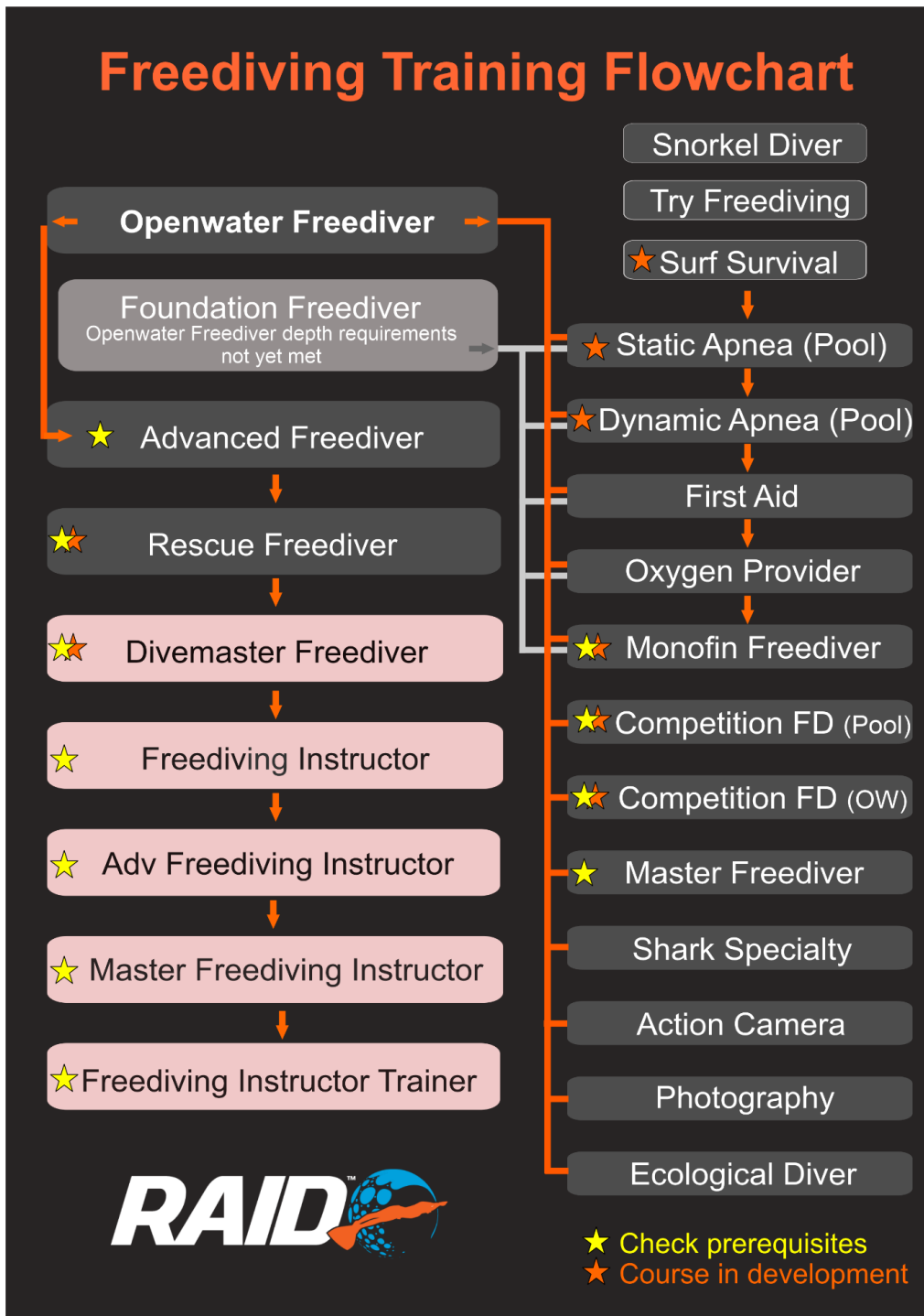
CONCLUSION

Congratulations on completing the RAID Freediving Dynamic Apnea Specialty course. You now have some useful tools for relaxation and dynamic apnea techniques, and for improving your dynamic performance in a safe and progressive way. If you haven't already completed it, the RAID Static Apnea Specialty is a great addition to further your pool training. Ask your instructor or local dive center for details.

Our sincere thanks to you, from all the team at RAID.

APPENDIX

FREEDIVING TRAINING FLOWCHART



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ACKNOWLEDGEMENTS

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