Early Transition to NEUTRAL BUOYANCY in Instruction

TONY FERNANDEZ

Mastering neutral buoyancy: At the early-learning stage, allow students to maintain light contact with the pool bottom.

After mastering mask removal and replacement while kneeling, your students can progress to performing these skills while horizontal.

In the June 2010 edition of *Scuba Diving* magazine, H. Kelly Levendorf argues "Our students should clear their masks while they're demonstrating neutral buoyancy, just as they'll ultimately do while diving in the open water." Although some instructors strive for this goal and take careful steps to achieve it, some do not. If having students perform key skills safely and confidently while neutrally buoyant is a goal, instructors should be concerned with finding the best ways for this to happen.

This article is the result of the collaboration of a number of scuba professionals from around the world – people who have discussed this issue through online forums and other means of communication and who have field tested instructional strategies while conducting courses. The instructors involved use instructional approaches that, though not identical to one another, all have the same goal: *at the end of an open water course, the student diver will be able to perform key diving skills in mid water while neutrally buoyant*. One of the most common elements in their instruction is limiting – or even eliminating – the common practice of having students learn and perform skills while firmly planted on their knees, whether in confined water or open water training dives.

The primary purpose of teaching students while on their knees is fractionalization. It allows them to focus on the specific task at hand. Students learn basic skills more easily if they learn them without distracting complications. They also learn better if they start simply and then move to more complicated scenarios that combine skills already learned, with each learning step allowing them to transfer old learning to new situations. The student who has learned skills effectively and learned to swim neutrally and in horizontal trim should be able to combine capabilities and perform key skills while in neutral horizontal trim.

Thus, a student who begins the first confined water dive doing a partial mask flood while kneeling should be able to remove and replace that mask in the fourth confined water dive while in the horizontal position associated with normal diving practice. Doing so requires a series of steps that wean the student from the need to "go vertical." In education terms, students need to transfer the skills they learned in a vertical position to performance in a horizontal position, and the instructor ideally provides the opportunities for this to happen so this transfer happens more efficiently.

Going carefully from a vertical, negatively buoyant posture to a neutral, horizontal posture through a carefully planned sequence is, indeed, how some instructors do it, but some instructors use a different approach. These instructors *have students neutrally buoyant from the beginning, even in the first confined water dive, with their legs resting lightly on the floor of the pool*. They are in a position similar to a fin pivot, with their upper bodies supported by the air in their BCDs. This doesn't impede learning because the light contact retains fractionized contact. It is not kneeling, but not having to focus on hovering (at first) that simplifies the skill. This minimal-contact-without-kneeling approach enhances transfer because the transition from this buoyancy state to mid water neutral is a smaller step.

The difference in the two approaches becomes unmistakable when teaching some skills, such as both methods of regulator recovery. With the sweep method, leaning to the right while horizontal requires a different body movement from leaning to the right while vertical. The effect of gravity on the regulator position also differs, so the hose and second stage end up in different places relative to the diver's center line. With the reach method, the difference is even more apparent. In a vertical position, gravity pulls the top of the cylinder down and away on the diver's back, which does not happen when in a horizontal swimming position. Conversely, when leaning forward in a horizontal position, the second stage hose tends to end up behind the student's right ear. Vertical students (as when kneeling) often struggle to find the regulator hose over their shoulder and therefore need to lift and tilt the cylinder. In a more natural swimming position, the hose is usually easily reached. It's still a good idea to teach lifting the cylinder with the left hand, but students who practice the skill in a normal swimming position learn they usually only need to do this when vertical, as when kneeling upright.

Mask clearing while horizontal is also different. *PADI's Guide to Teaching* Confined Water Dive 1, Mask Clearing (p. 14), says, "Stress proper head positioning (look up, or down with purge valve) and continuously exhaling through the nose." The purpose of looking up is to ensure that the contact between the bottom skirt of the mask and the skin is at its lowest point, but kneeling students may not need to raise their chins much at all because they're naturally in this position already. Students who can clear their masks while kneeling may have difficulty doing it swimming if they never learned to tip their heads back. In contrast, a student who learns the skill in a horizontal position, or who transitions to doing it horizontally quickly, must master this technique to be successful.

LAW OF EXERCISE

Thorndyke's *law of exercise* states that rehearsal or repetitive practice when coupled with positive feedback enhances skill acquisition. The technique used when students develop skills can establish lasting behavior patterns – favorable ones or unfavorable ones. If training emphasizes upright body postures, that behavior pattern of performance will be favored. If training includes horizontal posture so the vertical isn't favored, then skills transfer more readily to many different orientations in the water.

When a skill and a position are frequently associated – like kneeling and clearing a mask – the brain associates one with the other, and students may feel a need to get into that position to perform the skill. If it becomes a habit through repetition, it may take a lot of training to undo that association. A better approach is to avoid the association. Regardless of what position students initially learn a skill, you enhance transfer by very soon – during the same pool session – having them practice the skills in a variety of situations: other positions, neutrally buoyant, swimming, hovering, etc.

COMMON OBJECTIONS

When instructors have discussed the practice of teaching skills with students in a horizontal posture in online forums, they have heard objections from people who have not experienced training done in this way and who have trouble imagining it. They assume that it will take too long to get students ready to learn, students will be uncomfortable and unable to concentrate on the task, the skills will be more difficult to perform, and the instructor will not be in a position to control the student in case of a problem.

Those who teach this way, however, have found that these concerns seldom manifest themselves in actual practice. Because they used to teach students on their knees, they are in a good position to compare the processes and outcomes of both methods. They make these observations:

- Training takes about the same amount of time whether kneeling or neutrally buoyant with light bottom contact.
- Students become comfortable quickly with a neutrally buoyant, horizontal posture and do not need a long adjustment period.
- Many skills are easier for students to perform while neutrally buoyant and horizontal than if they are done kneeling and vertical.
- By staying close to the student, control while neutrally buoyant differs little compared to when kneeling.

One misconception many people have when first hearing of this approach is that it requires students to perform skills while

TONY FERNANDEZ; OPPOSITE: ERIC MICHAEL

in a full hover throughout the training. As stated earlier, that's not correct. It's not reasonable to expect the students to have mastered neutral trim at the early learning stages. Students are generally in light contact with the pool bottom while doing most skills. That is all that is required to take buoyancy from the task load. As their training advances, students will progressively make less contact with the bottom. The mask skills, including the no mask swim, are good examples. Students complete the swimming portion neutrally in mid water. As they replace their masks, their buddies hold them to assure they maintain a proper depth. Although they will try to stay neutrally buoyant, most students will let their legs drop down, usually touching the bottom lightly.

In later training stages, instructors demonstrate skills, such as replacing the mask after the no mask swim, while neutrally buoyant and in horizontal trim. Having seen skills performed this way, students have a clear model against which to pattern their own behavior. They have an image of what the skill should look like in a variety of contexts – not only kneeling.

The approaches to the open water dives vary to some extent as well, mostly because of the differing conditions under which instructors teach. Some train in open water dives in the ocean and must take into account tidal currents, while others teach in lakes or quarries and must contend with poor visibility and a need to use some form of platform. Whenever practical without compromising control, it's best to have students demonstrate all skills neutrally in horizontal trim, even while using a platform. In suitable conditions, entry-level divers generally have little trouble with this. In the few instances when kneeling is needed for open water control (surge is one example), students will still have the desired transfer if they practiced in a variety of positions during pool/confined water. Additionally, it is rare that over the course of all the training dives that all the skills must be done kneeling.

INSTRUCTIONAL STANDARDS ARE MET

During discussions on this topic, some instructors have the misconception that this approach violates PADI standards. This isn't the case. Standards do not usually stipulate precisely how the performance requirements for each skill must be met; they state only what the student must achieve. Instructors are free to use the most effective means they know to meet the standard.

Introducing skills with students neutrally buoyant making light contact with the bottom does not violate PADI Standards. Introducing skills with students kneeling initially, but then having them move quickly into practice in other position, while neutrally buoyant and while swimming also does not violate PADI standards. Additionally, according to both instructor experience and existing learning theory, both approaches (or a hybrid of them) would be expected to allow skills to transfer to "real world" use faster and more efficiently than "just kneeling" training scenarios.

When a student completes Open Water Diver certification, it means that the student is now a diver who can execute a dive comfortably and safely. Such a diver should be able to swim in horizontal trim with good buoyancy control, and that diver should be able to perform the basic skills taught in the Open Water Diver class fluidly while diving. The skilled instructor carefully plans the instructional steps needed to make sure that the diver has met that goal.

John Adsit - Boulder, Colorado, USA, Instructor

Andy Connor - Auckland, New Zealand, Instructor and Co-Director of Tech Dive NZ

Sage Dalton - Boulder, Colorado, USA, Course Director and Director of Training, Ocean First Divers

Joe Desimone - Jamestown, Colorado, USA, Instructor

Dr. Lynn Flaherty - Woodinville, Washington, USA, Divemaster

James Flenner, PhD - Reno, Nevada, USA, Instructor

Marcia Fisk Ong - Phuket, Thailand, Instructor and Managing Director of Gekko Scuba Divers Co. Ltd.

Jim Garin - Knoxville, Tennessee, USA, Instructor

David Herbert - Southern Oregon, USA, Instructor

H. Kelly Levendorf - Fort Lauderdale, Florida, USA, Instructor

Dr. Sam Miller III - Southern California, USA, Instructor

Peter Rothschild - Woodinville, Washington, USA, Instructor

Rob Turner - Rotterdam, Netherlands, Instructor

George Watson - Nederland, Colorado, USA, Instructor

Karl Shreeves - Technical Development Executive, PADI Worldwide

TONY FERNANDEZ; OPPOSITE: KAITLIN DANCA GALLI

UPLIFTING TRENDS

BCD designs are becoming more sophisticated and often, more specialized. Here's what you need to put your customers into the right one.

BY DARYL CARSON

BCD choice plays a significant role in divers' comfort in the water. It must fit well and perform as expected so they feel secure and in control. Educating divers — especially less experienced ones — about how the different BCD types function and then helping them match a suitable design with their skills and experience, is a great way to make happy return customers. In this case, success comes with knowing how to present the latest models, and this year's crop of BCDs shows two significant trends. One is the growing number of specialty designs, such as those meant for travel or "light-technical" applications. The second trend is the continued evolution of materials — everything from backpacks to bladders are becoming lighter and more durable. Here's what you need to know about five new BCDs and their signature features. >>

AQUA LUNG DIMENSION I3

Features: The brand-new Dimension i3 combines a back-mounted air cell and Aqua Lung's i3 inflation control technology. It includes flat e-valves, which are connected to the i3 control lever by a push-rod system. The Dimension i3 has a special Wrapture Harness System and the well-known SureLock II integrated weight system. The rear air cell is fitted with a strong retractor and the backpack includes a Valve Retention Strap.

Benefits: The i3 inflation system is both effective and intuitive, allowing buoyancy adjustments with the diver in any orientation. The Wrapture Harness provides a custom-like fit and is designed to support the integrated weight pockets. The rear air cell's retracting band helps ensure both a streamlined profile and more efficient deflation. One simple but elegant design element is the Valve Retention Strap, which pulls the top of the tank in toward the diver's shoulders to improve streamlining and stability.

Closing the Sale: The Dimension i3 is a good choice for divers who want freedom without sacrificing creature comforts and top-quality function. The rear air cell promotes excellent mobility and a low profile, both of which are preserved by the careful design of the Dimension's numerous other features. **aqualung.com**

MARES HYBRID MRS PLUS

Features: A travel-friendly BCD, the Hybrid has a unique foldable backpack with lightweight, honeycomb construction and a back-mounted air cell. Surrounding this core is Mares' MRS Plus (Mechanical Release System), which handles integrated weights, and the BPS Plus (Back Protection System), a dual-position pad that can be customized for additional lumbar support.

Benefits: Mares' foldable backpack is ultra lightweight and gives divers the security and stability of a classic rigid design, but folds up to be 30 percent smaller, allowing the entire BCD to fold up for easy transport. The BCD's Suspension System ensures all this portability does not sacrifice comfort with the detachable harness and seamless shoulder straps designed to support tank and ballast weight. The rear-mount air cell provides ample lift (19.3 kilograms/42.5 pounds in Men's Large) for cold-water diving, yet stays streamlined when swimming.

Closing the Sale: Familiarizing divers with the concept of load distribution, stability and customizable fit common to hiking backpacks will help them understand how the Hybrid enhances performance both above and below the surface. (Also available in She Dives version.) **mares.com**

OCEANIC BIOLITE

Features: One look at this travel BCD and there's no doubt about its intended application. The Biolite tips the scales at just 2.5 kilograms/5.5 pounds (size large) and features an ultra-low profile harness and back-mounted air-cell made from BioFlex material. The trim backpack can be folded for packing and Quick-Drop integrated weight pockets hold up to three kilograms/seven pounds per side. Trim weight pockets are included on the tank strap. Carabiner attachment points on the right shoulder and a pair of waist band-mounted D-rings provide storage.

Benefits: BioFlex material gives this dainty air cell a good bit of brawn, so it stands up well to frequent diving. All elements, from the integrated weight pockets to the harness and bladder, are shaped and sized to reduce bulk. However, the foldable backpack is well padded to ease tank weight. A streamlined inflator provides functionality with minimal bulk.

Closing the Sale: The Biolite is a minimalist's dream and ideal for adventure trekking. It's small enough to pack for nearly any traveling scenario yet gives divers the comfort and security that comes with diving their own gear. When every bit of weight and space counts, the Biolite should sell itself. **oceanicworldwide.com**

KAITLIN DANCA GALLI; CARRIE GARCIA (STUDIO)

IST DOLPHIN TECH JT40D TECH

Features: Designed as a single-tank tec rig, the JT40D delivers 18 kilograms/40 pounds of lift and is ideal for a 19.9 litres/95 cubic-foot steel cylinder. The donut-style air cell has a narrow frontal profile and is made from ballistic nylon. The modular design is built around a stainless-steel backplate.

Benefits: The narrow frontal profile of the air cell is ideal for single-tank use and greatly improves streamlining. Additional chest room is provided by the harness compared to classic shoulder straps made from five-centimetre/two-inch webbing. Integrated weight pockets make this system easy to use for cold-water and drysuit diving when extra ballast is often needed, and the combination of a stainless backplate, wide harness straps and beefy D-rings means this system easily accommodates carrying small stages.

Closing the Sale: The modular design means divers can quickly eliminate weight pockets, upgrade the air cell for double tanks or add D-rings. It also allows divers to have a basic tec-style rig even on strictly recreational dives. **istsports.com**

SHERWOOD ZODIAC

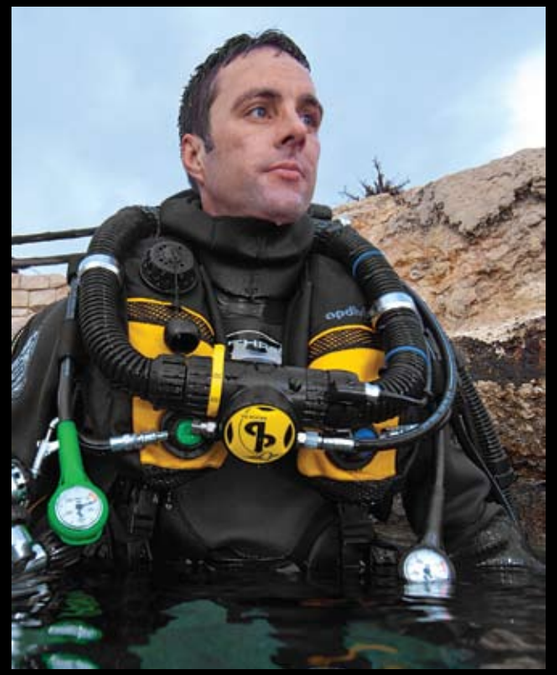
Features: The unique TPU (thermoplastic polyurethane) material of the Zodiac may appeal to some divers, but it's really meant to impress dive store owners and rental department managers. It has a classic wrap-around air cell design and provides 18 kilograms/40 pounds of lift. The Zodiac is available with or without weight integration.

Benefits: The slick TPU material used throughout the Zodiac doesn't absorb water, so it dries in as little as five minutes after diving, a boon to dive operators constantly battling wet gear. It's also highly durable, withstanding abrasions and wear as well as being completely resistant to UV rays, eliminating concerns over degradation from prolonged sun exposure. Sherwood claims the TPU material will not fade or crack. The Zodiac's classic design also makes it comfortable, stable and effortless to use in the water.

Closing the Sale: Some consumers may appreciate the low-maintenance of the Zodiac and the ability to put a dry BCD in the back of the car after diving, but most are likely destined for dive center rental racks. The motto here is: dive it, dunk it, forget it. **sherwoodscuba.com**

TECREC BENEFITS FOR DIVE CENTERS

While many PADI Dive Centers and Resorts are already offering TecRec training, many continue to concentrate on recreational courses. With rebreather courses now blurring the lines between recreational and technical diving, you may be wondering if it's time to take the plunge.



KARL SHREEVES; WATERFRAME/ALAMY

TECREC – WHY YOU SHOULD INCORPORATE TECREC INTO YOUR DIVE CENTER OR RESORT

There are numerous reasons why you would want to offer technical dive training at your business. Here are just a few:

• TecRec can help you to keep your best customers longer because it gives you yet another way to retain divers who want to continue with their education without becoming a PADI Pro. Give them the new challenge of TecRec and keep them coming back for years.

• The Technical Diving Division is dedicated to developing, marketing and supporting PADI TecRec programs – keeping PADI at the head of the technical diving community.

• Tec divers may be a small percentage of customers but they are typically very dedicated and prepared to spend a large proportion of their time and money on technical diving.

• You offer a whole package – you don't need to direct your divers to another training organization for their technical diving needs. You just introduce them to another level of training.

HELP FOR DIVE CENTERS – HOW TO GET STARTED

Existing technical diving instructors can take a Tec Instructor Crossover. These are primarily offered by TecRec Instructor Trainers, but may also be offered by PADI staff members in your region.

There are three levels of instructor – Tec Instructor, Tec Deep Instructor and Tec Trimix instructor. Most dive centers and resorts start with a Tec Instructor who can offer Tec 40. This is a great bridging course because divers don't need too much specialized equipment. Start by offering Tec40 and by the time you're ready to move on and offer more courses, you'll have customers that are ready to move on and take them.

PADI TecRec marketing packs – including images, website banners, store banners, posters, descriptive text, electronic slide presentations on course content, logos, brochures, TecRec continuing education flowchart and price list – are available.

For answers to more detailed questions, Technical Diving Division (TDD) Technical Consultants are on hand in each PADI Regional Headquarters. TDD members have special expertise in technical diving and can answer your training questions. You can also ask your PADI Regional Manager for help setting up TecRec in your business.

PADI MARKETING INITIATIVES SUPPORTING PADI DIVE CENTERS, RESORTS AND INSTRUCTORS RUNNING TECREC PROGRAMS

There are numerous initiatives that support the PADI TecRec program, including staff presentation at various dive shows and extensive coverage in PADI and PADI-sponsored media. Two of the most important are:

• **The PADI TecRec Blog (tecrec.wordpress.com).** This is *the* definitive place for TecRec and technical diving news. It also links to other social media sites and has an ever-increasing audience.

• **PADI-sponsored Tec Xplor events.** Designed to bring TecRec to your region and support PADI Members, these events are customized to different areas, but usually include the opportunity for divers to try (and discuss) tec dive kit, hear tec-related talks and find out about PADI TecRec programs.

CAPTURING THE TECREC MARKET

Decided you want to target the tec market? Here are a couple of ideas to get you started and get prospective tec divers into your programs:

• **Invite new PADI Master Scuba Divers.** Similar to inviting divers to Go Pro, send a personal note congratulating their achievements and tell them that they may be eligible to join a Tec 40 course.

• **Offer Discover Tec.** This pool or confined water experience in full tec gear is a great opportunity to capture those who meet the Tec 40 prerequisites and also to tantalize those meeting the Discover Tec prerequisites but not those for Tec 40.

• **Don't forget crossovers candidates.** The TecRec Blog Resources section has a list of qualifying certifications from other training organizations. Advertise that these qualifications from other training agencies can be used to meet prerequisites for both diver and instructor levels.

• **Market to PADI Pros.** They have already committed to the PADI System of diver education, have a high level of personal skill, love a new challenge and are keen to progress.

• **Offer TecRec Instructor training packages.** Schedule instructor courses so candidates can complete diver- and instructor-level courses consecutively.

• **Educate your staff.** Get your TecRec instructor to give other staff an overview of the courses or even offer them a discounted TecRec course. Once they have experienced it, they'll tell customers all about it.

• **Arrange for local tec talks.** High-profile local tec divers – especially wreck and cave explorers – are often happy to give a presentation on their latest exploits. Make it a casual event, but have information available about your TecRec courses.

• **Offer TecRec Distinctive Specialty courses.** This lets you tailor your offerings to the needs of your local area. A TecRec Instructor Trainer can also offer this course to instructor candidates as another unique selling point for your business.

• **Invest in tec kit for your business.** By having tec gear around, you will make Tec 40 accessible to divers without their own equipment or who are travelling and can't bring everything. Full tec kit – including stage cylinders and twins/doubles – can be used for both student divers in courses and for TecRec divers who just want to come and dive with you.

• **Organize tec dives.** If you don't have enough tec divers to fill a boat, work with another dive center or book onto a boat with existing tec customers. If you have a site that is appropriate for diving at different levels, use this to your advantage by cross-marketing to other divers on the boat.

• **Use multilevel training.** Schedule TecRec and recreational courses at the same location, where applicable. Also, make sure staff members are receptive to questions from divers at other levels.

• **Create a TecRec corner in your business.** Exclusivity sells, so set up a corner of the business and feature tec equipment, tec course details and tec diving information.

• **Create a TecRec sub club in your dive clue.** One dive center in the United Kingdom created special shirts available only divers with technical diving qualifications. The shirts became very desirable and ended up motivating divers to enter tec diving.

➤ *Looking for more ideas? Check out the TecRec blog (tecrec.wordpress.com) or contact a Technical Diving Division (TDD) Technical Consultants at your PADI Regional Headquarters* UJ