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Special Presentation for AIDA Instructor Course

Presentation Date: 06.02.2013

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Shallow Water Conditioning for Depth and Diaphragm Conditioning for
Freedivers

Any Freediving activity carried out in water of any depth should be properly supervised by someone appropriately qualified.

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I believe that in Freediving, adaptation to depth is one of the most important factors. Of course a high level of all round fitness must be maintained but there is no better training in my opinion than regular exposure to the pressures experienced at depth.

The main issue in my own training is my location. Living in London I simply don't have access to deep water on a regular basis, in the summer months we travel to the South of Wales to dive in a flooded quarry, this is 2.5 hrs away and very cold water diving, making relaxation and equalisation all the more challenging. Meetings are held once per month and whilst better than nothing they are hardly the regular exposure to depth needed to maintain freediving fitness.

How to overcome this?

Diaphragm and surrounding area flexibility:

As the lungs compress at depth the diaphragm is pulled up into the chest cavity to compensate for the smaller volume of air in the lungs and avoid Barotrauma. If the diaphragm is not loose and flexible there is risk of trauma to the surrounding areas and lung tissues. The key to avoiding this is to have a diaphragm and intercostal muscles that are supple and flexible.

Below are some exercises which I have found useful in maintaining good diaphragmatic condition.

Kapalabati Breathing:

This is an excellent way to strengthen and warm up the Diaphragm and a good way to warm up the abdomen area prior to stretching. It is also good for cleansing the blood, sending a rush of fresh oxygen around the body. It is a very energising practice, raising the heart rate and increasing 'prana' therefore should not be used directly before a dive.

Directions:

Sit in a comfortable position, upright with crossed legs or in a chair are ideal positions.

Exhale from the nose, making this first exhale forceful, noticing the Diaphragm raising sharply.

The inhale is passive.

This is one breath.

Repeat 15-20 times per set for 3 sets

Now that the diaphragm and surrounding areas are warm and have blood flowing through them we can begin to work and stretch the muscles. One of the best exercises I have found for diaphragm flexibility is from yoga called Udiyana Bandha.

Udiyana Bandha:

Stand with feet shoulder width apart

Bend the knees slightly

Place hands on the knees, your back and arms needs to be straight to support your upper body.

After a few breaths, inhale slowly and deeply through the nose.

At the end of the inhalation open the mouth and extend the tongue out as far as possible towards the chin. While slowly exhaling, making a clear, steady 'Aah' sound from the back of the throat, keeping the mouth wide open, squeezing as much air out of the lungs as possible. (this is called 'Lions Breath' and is an excellent asana, good for detoxifying the body, alleviating diseases of the throat, nose, ears, eyes and mouth. Tension is removed from the chest and diaphragm, reducing stress)

Hold your breath with empty lungs

Recall the lower belly back and up towards the spine

Still holding the breath push out the abdomen fully then pull it back in towards the spine fully, this is one round, repeat until you feel the need to breathe.

Whilst holding the breath in Udiyana Bandha you can play about with the sensations felt when moving the upper body in the following ways:

- Alternately leaning the shoulders forwards.
- Standing slightly more upright.
- Alternately contract the left and right side of the abdominals.
- Standing upright in Udiyana Bandha, raise the arms outwards and upwards palm up, opening the shoulders and closing the shoulder blades together.

Controlling the abdomen in Udiyana Bandha takes considerable muscle control and can take some time and practice to master.

Exercises to be performed at depth:

For the following exercises I have access to a High diving pit in London with a maximum depth of 4m. I find it best to wear a thin wetsuit for these exercises to avoid getting too cold.

Safety Note:

When performed on land these exercises are safe and effective making them suitable for intermediate level Freedivers, the next step is to perform them at depth, making them suitable only for advanced Freedivers with previous experience of diving at depth.

Modified Udiyana Bandha Stretching at depth:

I perform the Udiyana Bandha exercise described above kneeling at the bottom of the dive pit with exhaled lungs. This increases the pressure exerted on the Diaphragm and the surrounding tissues greatly. I would recommend 2/3 short 30s empty lung statics at the bottom to begin with to warm up.

It may be useful to rest a weight belt over the thighs if you are training in a wetsuit.

Using a noseclip rather than a mask is preferable as this leaves both hands free to slow the decent should you need to.

Once warmed up, on the next holds you can play with the sensations of the abdomen whilst in Udiyana Bandha by:

- Standing on the bottom, bend forward at the waist, resting the hands on the knees. Rotate the shoulders forward gently left and right.
- Pushing the abdomen in and out slowly and gently
- While kneeling, raise the arms above the head
- Keeping the arms above the head, lean over to left and right.
- Performing the asana, 'upward facing dog' Very gently.

Mouthfil Training at depth

For this next exercise some equipment is needed.

- A length of rope long enough to reach the bottom of the pool from the surface.
- Sufficient weight for the bottom of the line to pull yourself down to the bottom.
- A float to secure the line to, alternatively it could be tied to the pool ladder or run down the pool wall.
- Nose clip and wetsuit.
- Begin in the water, holding the line.
- Exhale as much air as you can until you are at maximum exhalation. Do not reverse pack.
- Keep a mouthful of air.
- Revert your position so you are under water upside down.

- Slowly pull yourself down the line equalising as you go.
- Keep going until you either reach the bottom or you cannot equalise any further.
- Return to the surface.

The exercise can be repeated with the following variation:

- Exhale as much air as you can until you are at maximum exhalation. Do not reverse pack.
- DO NOT fill the mouth.
- Descend down the line to the previous depth reached.
- Try to refill the mouthful.

The exercise can be made harder still by:

- Fill one mouthful at the surface.
- Empty the mouth.
- Re-fill the mouthful again.
- Descend as far as you can.

This exercise is good training for the mouthful technique and reproduces pressures felt around a divers failure depth.

These exercises should be performed very slowly and gently and of course with a dive buddy watching you from in the water.

After your dive:

The Diaphragm is a muscle like any other. Like any muscle it will respond well to stretching after exercise. I perform the dry exercises at the start of this document after any deep diving session when the diaphragm and surrounding muscles will be most receptive to them.



Conclusion:

The exercises shown here, have proven useful to me in maintaining a good base level of body conditioning for depth freediving during long spells away from depth, providing me with not just a physical but a good mental reference to parts of a dive I previously thought unachievable in shallow water, they have also enabled me to acclimatise easily when arriving at various freediving events, maximising training time.

