WHAT TO DO IF A CONVULSION HAPPENS?

By Cedric Verdier

The main goal of this article is to end up with some guidelines to safely and efficiently deal with a convulsing diver.
Those guidelines are purposely:
- **Simple and easy to remember**. In a real life emergency the technique is always more complex to perform and more difficult to remember, even if the rescuer practises it on a regular basis.
- **Flexible** enough to be used in most of the circumstances (dry suit or wet suit, etc) and with all the rebreathers available (back-mounted/OTS CLs, SCR/CCR, etc).

Remember that symptoms and signs of Hyperoxia are highly variable. Susceptibility varies both between individuals and within the same person from day to day.
A grand mal convulsion generally occurs in three phases:

1. The 'Tonic' phase - a period of body rigidity which may last for up to a minute. It is dangerous to attempt to surface the casualty at this stage because spasm of the glottis and respiratory muscles will result in inadequate exhalation and may therefore provoke pulmonary barotrauma.
2. The 'Clonic' phase during which the casualty undergoes true convulsions. This can last for widely varying periods of time.
3. The 'Resting' phase during which the victim actually resumes breathing.

<u>During the convulsion</u>

1. **Step 1: Stabilizing the victim in the water column.**

- If the diver convulse close to the bottom, find a stable position on the bottom or on a shot line.
- If the diver convulses in mid-water or during deco, try to maintain the depth by catching the ascent line.

Note: If a convulsion occurs underwater, the diver's depth should be kept as constant as possible until at least the tonic/clonic because of the risk of pulmonary barotrauma during the ascent. If the rescuer can attract attention and get some help, a second diver can send an emergency SMB to make the surface support aware of the situation.

2. **Step 2: Checking the mouthpiece**
   A. **If the mouthpiece is in the mouth:**
   - Leave the mouthpiece in place and maintain it. Make sure that the victim cannot loose the mouthpiece.
   - Open the OPV of the rebreather

- Flush the loop, if possible with a gas of lower oxygen content.
- Keep the diver's depth constant until the convulsion subsides.

Note: Never try to swap the DSV for another regulator with a lower O2 content. The risk to have water entering the airway is simply too high. Instead flushing the loop is useful as the rescuer doesn't know the loop content. Even if the loop is flooded, a diluent flush could help in any case.

B. If the mouthpiece is not in the mouth

- Do not attempt to replace it but ensure that the mouthpiece is switched to the surface position.
- Try to seal the mouth.
- Start a slow ascent immediately.
- punch out gas from victim at least every 10 metres / 30 feet.

Note: Opening the mouth to put in a regulator might only achieve water introduction/drowning. That's why the rescuer shouldn't try to put it in if it is not already there. The rescuer can eventually attempt to seal (externally) a second stage with a breathable mix against the lips in the hope that if breathing resumes air will be inspired instead of water.
Wearing a FFM is one of the best solutions to deal with underwater convulsions. A neck strap is also a cheaper option.

When the convulsion subsides

3. **Step 3: Opening the airway**
   - Ensure that his airway is open after the convulsion stops by keeping the neck extended.
   - If the mask is empty, leave it in place.
   - If the mask is partially or completely flooded, pinch the nose to make sure no water will enter the airway. If necessary remove the mask to pinch the nose.

4. **Step 4: Checking for signs of breathing**
   A. If the diver breathes:
   - Slowly inflate the victim's BC to start ascending.
   - Tightly maintain the mouthpiece in place.
   - Make a controlled ascent maintaining a slight pressure on the diver's chest to assist exhalation.
   - Perform as many of the decompression stops scheduled on ascent as possible.

Note: Depending on the circumstances, the equipment and personal preference, the rescuer can choose between a face-to-face position and grasping the victim from the back. The important points are to:
- *Maintain the DSV or the second stage and extend the neck,*
- *Open the victim's loop OPV (and the dry suit purge if appropriate)*
- *Control the victim's BCD purge,*

- *Control the rescuer's own buoyancy.*

With a breathing victim, there is no need to rush as nothing is life-threatening. The rescuer can take his time to perform his decompression requirement and ensure his own safety.

B. If the diver does not breathe:

- Inflate the victim's BC or release some weight or accessories (canister light, sling tank, etc) to get ample positive buoyancy
- Punch the victim to vent gas during the ascent at least every 10 metres / 30 feet.
- Depending on the circumstances, send the victim to the surface or accompany him.

Note: A non-breathing victim has to quickly reach the surface. Depending on the rescuer's decompression requirement, there are only 2 options for the rescuer:

- *Going with him at the surface to provide first aid or to make sure the surface support is alerted (the rescuer can then return to his missed stops)*
- *Sending the victim to the surface on his own (if possible up an upline so as to assure that he is not "lost").*

Remember that even after a maximal expiration there may be a couple of litres in the lungs. If someone is unconscious and stop breathing at depth it may take 15 minutes or more before the brain becomes hypoxic enough to kill him.

<u>When at the surface</u>

5. **Step 5: Providing first care**
    - Inflate the victim's BC if not previously done.
    - Call for help.
    - Remove the victim's mouthpiece.
    - Close the DSV to prevent the possibility of the rig flooding and weighing down the victim.
    - Ensure the victim is breathing or initiate mouth-to-mouth resuscitation.
    - Transport the victim to the nearest chamber and have the victim evaluated by a diving physician.
    - Rescuer may perform missed deco procedures if appropriate (without delaying evacuation).

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