

## **The Dangers of Underwater Swimming are Real - Mexican Player, Omar Ortega, Drowns at Practice**

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On Tuesday, January 27th, [end of 1990s] Omar Ortega, a nineteen year old member of the Mexican National Jr. and Senior Water Polo teams drowned during national team practice. The team, preparing for this summer's Pan American Games, was doing underwater swimming at the end of practice. Apparently, Ortega fainted and went unnoticed on the bottom of the 50 meter pool - until it was too late to save his life.

This tragic incident is by no means isolated. Coincidentally, my son, Wolf Wigo, a member of the 1996 US Olympic Water Polo team and a current US National Team player, almost suffered the same fate in our backyard pool over the Christmas holidays. Wolf was doing underwater swimming with his two young brothers and some neighborhood kids, when he fainted. At first it was thought to be a practical joke, but when the kids recognized it might be more serious they called me from the house. When I saw him on the bottom, I immediately knew something was wrong and dove in to get him. He was blue, convulsed with eyes wide open and not breathing when I got him out of the water. Fortunately, I was able to resuscitate him without any permanent physiological damage, although he was taken to the hospital for observation and his chest hurt for several days from water in the lungs.

Unfortunately, Ortega's coaches, friends and family weren't so lucky. What happened to Wolf Wigo and Omar Ortega? How could these two highly conditioned watermen faint underwater? The answer is a phenomenon known as SHALLOW WATER BLACKOUT.

Shallow Water Blackout is most commonly associated with skin diving, but the more swimming coaches I speak with, the more I have come to realize that underwater fainting is not at all uncommon in the world of competitive aquatic sports. The condition of Shallow Water Blackout is connected with the mixture of carbon dioxide level (CO<sub>2</sub>) and the partial pressure of oxygen level (PO<sub>2</sub>) within the lungs.

Individuals breathing under normal conditions use the partial pressure of oxygen in the lungs. Carbon dioxide, on the other hand, serves as a stimulus to breathing by informing the brain that a person's body requires another breath of air. This process occurs in any prolonged holding of breath, including underwater swimming. Normally there is no danger because the carbon dioxide build up in the blood signals the brain that you need to take a breath by giving you the sensation that your lungs are going to burst if you don't get a breath.

The problem comes when a swimmer or diver manipulates the brain's automatic breathing control device through HYPERVENTILATION. Hyperventilation is the repeated inhalation of fast, full breaths of air and rapid exhalation. The effect of hyperventilation is to wash CO<sub>2</sub> out of the lungs, resulting in an extremely low CO<sub>2</sub> level. While the underwater swimmer burns up oxygen through exertion, he never gets the signal from the brain - the "bursting lung" sensation - because of the low level of CO<sub>2</sub> in the lungs and blood. Without the CO<sub>2</sub> stimulus, the brain doesn't recognize the need to breathe and the swimmer blacks out from hypoxia, a lack of oxygen to the brain.

The blackout victim is in an extremely dangerous position at the point of unconsciousness. Seeing him underwater will fool observers as the unconscious swimmer often makes seemingly coordinated movements even after the faint comes on. He does not appear to be in difficulty. And irreversible physiological brain damage from a lack of oxygen is only minutes away, even if he's saved from death.

I do not know the circumstances behind the drowning of Omar Ortega, but my son's near drowning incident must stand as the classic example. Wolf and the other kids were having a contest for underwater distance swimming. As Wolf prepared to go, the kids were shouting, splashing, jumping and teasing in an effort to prevent him from beating their combined distance record. As Wolf prepared to start, he'd take a few deep breaths and then burst out laughing. This scene was repeated several times before he finally took off - unconsciously and by circumstance - super hyperventilated. At some point, after being underwater for about a minute, and after he had surpassed the challenged distance, I heard the kids yell, "Dad, Wolf stopped.... He's pretending to drown". This sounded logical as both Wolf and I had done this on occasion in the past. The kids then swam out to where Wolf was and proceeded to "attack" him.

That's when they recognized something was wrong and called to me for help.

In talking to the kids after the incident, they thought nothing was wrong because "Wolf was moving". Wolf faintly remembers the kids coming down to him but it was like a dream. He had no recollection of being in trouble or anything after that. This dream experience and no sense of trouble has been corroborated by another "survivor" of Shallow Water Blackout with whom I spoke.

Does this mean you stop challenging your swimmers with underwater swimming? No, but if you are not warning your swimmers about the danger of hyperventilation and monitoring them while they swim underwater, you run the risk of suffering tragic and irreversible consequences.

The USA Water Polo community, and I, mourn with the family, coaches and friends of Omar Ortega and hope that in relating this tragic story, we can prevent similar incidents from happening to our athletes in the future.