WHY WORRY ABOUT DROWNING? *

Col. Richard H Wood

We may be approaching this problem of drowning (or not drowning) all wrong! We confuse the cause of death with the cause of the accident - and they *aren't* the same.

When someone falls, we know it's the sudden stop that really smarts - but we don't spend much time on that end of the problem. Why, then, don't we accept drowning as the expected result of trying to breathe water and concentrate on preventing the situation that causes it? *"Don't we?"* No. Not to any great extent. The thrust of most water safety programs is aimed at the idea that better swimmers, more lifeguards, and closer supervision will prevent drowning. To a certain extent, they will; but when you consider that drowning is the second largest cause of accidental death the Air Force, you'd have to say that the total program has some weak spots.

One weakness is the emphasis on rescue. We are, in effect, putting a mattress under the building instead of a railing around the balcony. Another weakness is that we naturally assume that a good swimmer won't drown. Since good swimmers *do* drown, there may be something about drowning that is not related to swimming proficiency that we are overlooking.

Let's try a little prevention. Since drowning will occur whenever a person tries to breathe while his mouth and nose are immersed in liquid, let's speculate on what might cause that.

For openers, we can sav that anyone who loses consciousness in the water is a likely candidate for drowning. He hasn't much choice. That suggests that the running, head-first dive may not be our greatest athletic achievement. It's hard to think of any other activity where we so willingly use our head to scout for obstructions. But most people who drown are not *initially* unconscious. Furthermore, they know how to swim. They may even be good swimmers. *Why do they drown?*

Accident reports aren't much help. Just when the report approaches that moment of truth, that instant when we are finally going to learn the secret of drowning, it gives us a verbal shrug of the shoulders:

"He became exhausted."
"He exceeded his limitations."
"He drowned."

There are some new ideas about drowning that make a lot of sense and suggest a new approach to prevention. Dr Michael B Strauss describes what is probably the leading cause of drowning. It goes like this: a problem (currents, fatigue, surf, leg cramp, cold water) causes the victim to panic. The victim begins breathing very rapidly, and the exchange of oxygen and carbon dioxide becomes increasingly inefficient. The rapid breathing results in shallow breathing and is extremely exhausting. The relatively small amount of air kept in the lungs may cause the victim to become less buoyant, which requires more effort, which increases the breathing rate and the panic .... this "vicious circle" may lead to the collapse of the victim. Once he collapses, drowning becomes a formality.

Keep the above description in mind for a minute while you read the report of an actual drowning. The following investigation was unusually complete because the victim had

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been scuba diving, and his “buddy” made an excellent witness.

“ .... they proceeded toward the exit point, about 50 yards away. Before reaching the exit point, swimming with the current, X began to tire and ‘acted scared’. The current carried them beyond their exit point. They began to look for a suitable exit (the shoreline was a rocky cliff) but found none. X was tired, breathing very hard, and becoming more frightened. As X’s breathing became more laboured, he became more frightened, and his buddy felt it imperative to get him out of the water as soon as possible. They began an exit over the ledge at the base of the cliffs, but a wave loosened their grasp and pulled them back into the water. At this point, X quietly drowned.” Just like that! He quietly drowned!

I have a high degree of confidence in that description. Over a few years’ worth of teaching scuba diving, I have watched, on several occasions, a supposedly good swimmer go from a relatively controlled situation to a state of near collapse with frightening speed - sometimes in as little as 30 seconds.

They all start with rapid breathing. The victim is spending energy, perhaps because he’s cold, frightened, over-exerting himself, or a combination of these; and his respiratory system is trying to keep up by demanding more air. To keep breathing rapidly, he must keep his mouth and nose fully clear of the water and this requires even more energy, which demands more rapid breathing, and so on. Viewed underwater, his arm and leg movements become faster and less efficient, which requires even faster movement and more energy. Back on the surface, breathing rate is accelerated at a runaway pace. The process appears irreversible, and collapse is seconds away. Without assistance drowning is inevitable.

“Aha,” you say, “if I become exhausted in the water, I’ll merely float on my back and rest while I recover.”

“Aha,” I answer. “I don’t think you will, and I’ll tell you why.”

To begin with, most of us float only if we control our breathing, keep our chest expanded, and keep a certain amount of air in our lungs. A person gasping for breath does not do any of these. Next, many swimmers can float only if they relax and assume the floating position they were taught. An exhausted swimmer gasping for breath is anything but relaxed. Third, if there is any wave action at all, it takes a certain amount of energy to keep from being tipped over or swamped by each wave. Ocean floating isn’t quite as easy as pool floating. Finally, cold (or cool) water is a user of energy all by itself. Even if you manage to relax and float without movement, the body’s answer to being cold is to spend energy.

The point of all this is that once you become exhausted in the water, you can’t simply stop and do nothing while you catch your breath. You must spend a certain amount of energy just to stay afloat and breathe. If you are spending it faster than you are recovering it, you are going to collapse and drown.

Now think for a moment about your own personal reaction to exhaustion. Can you approach exhaustion and then recover from it by merely slowing down? Up to a point, you probably can - but beyond that point you’ll have to stop. And that’s when swimmers become drowners.

In testing applicants for Scuba training, I’ve tried a number of different swimming tests. Finding out who can swim is simple enough, but finding out who won’t drown is another matter. The test I like best, at this writing, is to require applicants to swim far enough (440 yards) to get good and tired and then go immediately into

20 minutes of survival swimming without any rest. I don't care whether they float, tread, bob up and down - I want to see them recover from exhaustion while avoiding drowning. You might be surprised at the number of good swimmers who find that difficult, but that's what it's going to be like in the real ocean. You just can't stop and hang onto the side of the ocean while you catch your breath.

Let me sell you on this one point. Rapid breathing in the water is a *real* danger signal. It tells you that your "energy" system is out of balance and is going to zero if you don't Stop it. Regardless of how good a swimmer I may be, I know that if my breathing is rapid *and increasing,* I am getting close to my own point-of-no-return. I must stop and recover before I get to that point.

Now, that's not easy. A swimmer does not become exhausted for no reason. There is an objective involved. Perhaps the swimmer is trying to get to a boat or to the shore. Perhaps the boat is drifting away and he is trying to catch it. Recognizing exhaustion and stopping to recover is *not* what the swimmer wants to do. He is, literally, like the guy who drives faster so he'll get home before he runs out of gas! He is usually willing to spend all of his energy in pursuit of his objective; and he is rarely in a mood to listen to reason. Failure to reach his goal may be inconvenient or even dangerous, but failure to stop and recover from exhaustion can be fatal!

So, recognize exhaustion for the danger that it is and decide right now that you are going to handle the exhaustion problem first and any other problem next.

Secondly, if you are assisting an exhausted swimmer, don't be in a big hurry to get him out of the water if it is going to cost him energy. Get the exhaustion under control first. Unburden him (if he is burdened); give him something to hang onto or support him so he won't have to spend any of his own energy to stay afloat; and help him relax while he recovers his breath and his composure. Getting him out of the water is not an essential part of the procedure.

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The paper by Dr Kerr is an extremely interesting account of Pulmonary Barotrauma from the customer's point of view. If you couple this with the account from Howard Pollock, which has been delayed in presentation by a lack of space in previous issues, you will perhaps suspect that an attempt is being made to start you thinking about the critical factors concerned in causing symptomatic pulmonary barotrauma. There are too few reports readily available and case notes are requested, or at least note of the existence of cases. Understanding of this disease is at present inadequate yet is critical for a medical Ex Cathedra ruling on the practicing of "Free Ascent" as a training procedure.

The above may help you gain the maximum benefit from the articles that follow, to whose writers sincere thanks are given. These originate in this issue from Australia, Singapore, the USA and the UK. To misquote, "Underwater is underwater is underwater" the whole world round, and the fullest sharing of information and hard won experience possible is highly desirable. It seems pointless to die to prove that we can make the same mistakes as the other fellow.

It is appropriate at this time to offer hope for a prosperous, happy and disaster-free New Year. In this respect the cartoon, and we all owe a debt of gratitude to Mr Peter Harrigan will serve better than a picture of Santa.

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