Cold water immersion best practices, Salish Rescue.

Our goal is to save lives and many of those will be from accidental immersion in the very cold waters of our Salish. It ranges around 50°F summer or winter and that is certainly cold enough to be dangerous. The saying is, “fifty degree water gives you a fifty percent chance of swimming fifty yards unprotected.”

The body reacts in some strange ways to cold-water immersion. The first thing that starts happening is vasoconstriction, the shutting down of the peripheral system to keep the core alive. This restricts the amount of blood circulating in the extremities and raises the core pressure. Hold that thought for a second, we need to combine it with another.

Hydrostatic pressure acts on the body, particularly the legs (since they are deeper and subject to higher pressures), and this further changes circulation. Combining these two forces gives us warmth and high enough pressure to keep the body alive, it unfortunately puts the heart in state where it cannot increase the pulse rate enough to do anything useful. The entire system is very close to failure and this is where we come crashing in. The clock is running out on survival by the time we have reached a patient. They’ve survived this long on one strategy and we can shock them enough that they will simply die during the rescue. Some studies suggest that one out of five die during the rescue. I’ve seen several examples of this, alive on reaching them and dead before we could get them into the boat. Usually, but not always, they have extremely low core temps.

Think that through, the core temps were taken after transport to shore and examination. The core temp had been sustaining life, until we disturbed the fragile balance the patient was maintaining. Once we got them out of the water and got them flat they lost gravity, hydrostatic pressure and low heart rate. Huge changes happened to the hemodynamic profile and core temperature, the heart has few tricks left. The mixing of cold and warm blood, position change and heart rate increase all work against survival.

1. Recover them as horizontally as possible: if you can avoid lifting them vertically that’s good. If you must get them out this way get them sitting as fast as you can. Laying them flat may help the heart, but it may make things worse. Current best practice is to keep them down, not standing, but with the head elevated a bit. They seem most comfortable this way and it allows them to start adjusting slowly.

2. No walking or using the legs. They should not walk until completely recovered. There is a bunch of cold blood in the extremities that needs to stay there for a while.

3. Don’t make them work for it: Don’t ask them to pull, climb or exert themselves.

4. Stay calm, move slow, keep the process smooth and careful.

5. None of this matters as much as getting them out of the water. There is no survival option in the water, there may be one out of the water.

6. Once they’re out: Stop them moving and stop them from losing heat. Hats are the best, scarves around the neck second, wet clothes off is a slower and more careful process. Cutting clothes is best, flexing and moving them to remove clothes is what we are trying to avoid.

7. Wrap them up: vapor barriers help, but layers and thickness work as well.

8. Keep them from moving or walking. Shivering is good, you can’t stop it even if you want to.

9. Calories fuel heat: They don’t need hydration, however they are starving.

10. Warming is a whole book. The place to do it is the ED of the hospital.
Recovery of PIW, Salish Rescue

Reach, throw, go, etc. Always have a hook out and a throw line handy. First chance may be the only one you get.

Close approach with vessel, J turn, wind and current. Try to get alongside the patient and down wind and down wave from them, we don’t like patients under the boat. Best approach is vessel axis a few feet to one side of patient then slow turn 90 degrees to present beam or fwd quarter.
Neutral is the call, crew should ask and remember it is the coxswain who will declare the boat “neutral” and safe for pick up. All use of motor must stop if patient gets within six feet of motor.
Lines in the water both from rescue boat and from ‘chutes or kayaks will disable your boat. Avoid them and be ready to clear them.

Pulling them out, dunk, wrist strap, leg grab. Use life jackets if they’ve got them, but be careful of poorly fit or adjusted ones that will come off. If you can’t get them on an easy first grab then put a loop around one wrist and use that to keep hold of them. If you get them part way out hold at the gunnel and try to get a leg, or better yet get a strap around a leg, that gets them much further.

B-boarding from the water, with swimmer, without assist (two person). Easiest way to safely get an unconscious person out without endangering c-spine, remember to use a line or strap to pin patient to the board.

Thermal protection of the patient once they are on board is critical, hats and space blankets are a start. Never try to rewarm on the water, never allow any exertion or let them walk.

Secure in the vessel, sitting up and either able to hang on or with someone keeping a hand on them, once we get ‘em we don’t give them back!

Transfer to another vessel. Secure vessel together, all hands paying attention. Safety brief on the transfer and somebody keep a line on the patient at all times.

Transfer to dock or beach. Don’t assume that EMS or bystanders know how to handle a hypothermic patient. Be loud and clear about the patient not walking. Transfer must be slow, deliberate and safe.
Search Tactics, Salish Rescue

The process starts with a few questions, primarily about the what, where and who of the search. What we need to find (ships are easier then people), where it is that we need to look for it (sea, size of area, daylight, weather), and the who is about the quality and quantity of resources.

Target, environment and capability now have to meet mode, tactics and resources to form a plan. The plan will get us to our briefing (benchmarks, timelines and trigger points).

Let’s start with mode, it’s the launch or research threshold. If we have enough to clear this hurdle then we should have an outline of our tactics.

Tactics (with some target info), plus area get us to resourcing.

Tactics are the linch pin. Several forces conflict in setting priorities in how we assign resources.

Highest probability is the area that we believe them to be. We have a little info, or a lot and we can make a guess. If we are right we have solved the problem with great speed and few resources. Good job team. If we are wrong we don’t have a best second guess.

Containment is the lowest probability search. Maximum area that they could be in. If we search it all, we will find them. This is great if all we want is certainty. What we really want is survival.

PLS-drift plot is the way to take all information available about the what (target) and the where (it was when last seen and may have gone), and combine it with a model of known forces that could have affected it in our time of interest. It’s something of a hybrid of the first two.

Grid searching is just like it sounds, basically using the search swath of a platform at measured intervals to eliminate area.

Vector is a PLS system to really thoroughly search on spot. Mostly if the visibility or sea conditions prevent you from conducting a high certainty initial search.

Expanding circle is a PLS system that simply spirals out from a point and expands the search area by swath width each sweep.

Shore check is the idea that not all people, vessels or bird that are reported lost are actually at sea. It can include physical searches and interviews with witnesses.

Resource utilization is about typing and grouping search assets.

Search coordination is about communicating activity, results and plans to other agencies or interested parties.
Quick medical, Salish Rescue

Any member of the program must be able to conduct a quick medical assessment and communicate the result. It requires basic observation skills, an ability to ask a couple of questions and some counting. Making notes, or using a checklist is really a good idea.

Incident:

Location:

Time right now (as accurately as possible):

Position and condition of person: Sitting, lying, wet, dry, muddy, jumping up and down.

Obvious problems: Cold, broken leg, stab wounds, clutching chest, coughing, etc.

Best response; says hi, tracks, answers questions, moves or grunts, lethargic, unconscious

Respiration: very fast, normal, very slow, funny sounds, coughing.

Pulse: wrist (BP 100), arm (bp 80), neck (bp 60), none detectable.

Color and temp: Red, pale, warm, cool, cold.

Anything they say about how this came to be this way; history of, just took medicine, etc.

What we are doing to make it better; blanket, dry off, call help.

Who we are telling about this: CG, 911, etc.

When we communicate; just times, written down.

This whole process should take a minute at most. It’s just a template to standardize how we talk about and monitor patients.
1. Push food walls
2. Push food wall
3. Push doors
4. Heads + shoes
5. Throwing + line
6. Stumble + flick
7. Pilot point
8. 270
9. Final approach
10. Early run
11. Speed
12. Scoring
13. Angle
14. 1-2-3
15. Hip few
16. To hip + test
17. Short to catch
18. Transmission point
19. Counterpart + handling
20. Scan deep
21. Ring + handplant
22. Ring + catch
23. Bow few short
24. Bow few long
25. Rock lines and angles

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