Drowning SOP

Great North Air Ambulance Service

Further reading

Resus Council 2021 - Special circumstances
Tipton et al. Resuscitation 2011
Szpilman et al. NEJM 2012

Related SOPs

Cold injury & hypothermia SOP	Decompression illness SOP

The process of experiencing respiratory impairment from submersion/immersion in liquid

- <C>ABCDE approach
- Consider other injuries, especially in watersport accidents or jumps from height
- Consider medical conditions that may have led to accidental drowning
- Water rescue requires specialist training and should not be attempted by GNAAS crews

Cardiac arrest from drowning

Cardiac arrest from drowning is regarded as a special circumstance, and some factors may promote a more favourable outcome than in standard cardiac arrest situations:

1. Patients are often younger with better physiological reserve
2. Varying degrees of hypothermia may confer some cerebral protection whilst in arrest, particularly during the winter or in the very young

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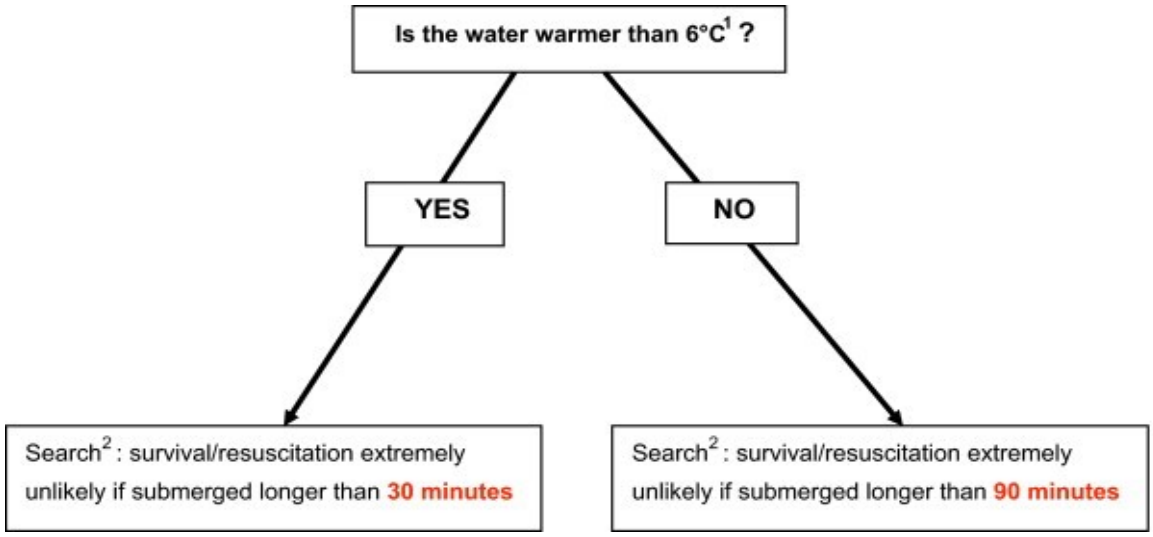
Decision making

Evidence in the literature is limited to case reports and expert reviews and should therefore be applied with this in mind. Neurologically intact survival has been reported in several victims submerged in icy cold water for greater than 60 minutes. In the vast majority of cases, the presenting rhythm will be VF or asystole and the patient will have fixed dilated pupils, but this should not deter resuscitation attempts. The 3 most important factors to consider are submersion (circulatory arrest) time, water temperature and patient size. The algorithm below has been recommended in a guide for rescuers about whether to start resuscitation or not (Tipton et al.)



Note that UK sea temperatures rarely fall below 6°C even in winter, but inland water may frequently do so **between November and April**. Also take into account factors such as whether there was potentially prolonged immersion prior to submersion which would also favour hypothermic cerebral protection.

Where resuscitation is commenced in presumed cerebral hypothermia, it is likely to be prolonged. The following points are suggested:

- Use ultrasound to assess cardiac activity
- Use mechanical CPR from an early stage
- Emphasis on maximizing oxygenation and protecting from aspiration - early intubation
- Consider gastric tube decompression of stomach, particularly in children
- Consider withholding resuscitation drugs until core temp >30°C. Defibrillation may be attempted up to 3 times, but if unsuccessful should then be withheld until >30°C.
- Between 30-35°C, the interval between drug dose may be doubled

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Triage

Patients should ideally be received at a centre that can offer extra-corporeal life support (ECLS) - either cardiopulmonary bypass or VA-ECMO. Incidents should be discussed on a case by case basis and GNAAS clinicians at the scene will be in a unique position to act as the patient's advocate and should push for what they believe is the optimum treatment strategy.

RVI, JCUH, Blackpool or Wythenshawe in adults

RVI or Alderhey in children

Water temperature	>6 °C	≤ 6 °C
Estimated submersion time	Resuscitation efforts should commence if <30mins submerged	Resuscitation efforts should commence if <90mins submerged
Resuscitation strategy	As per standard ALS	**Consider Extra-corporeal life support**

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