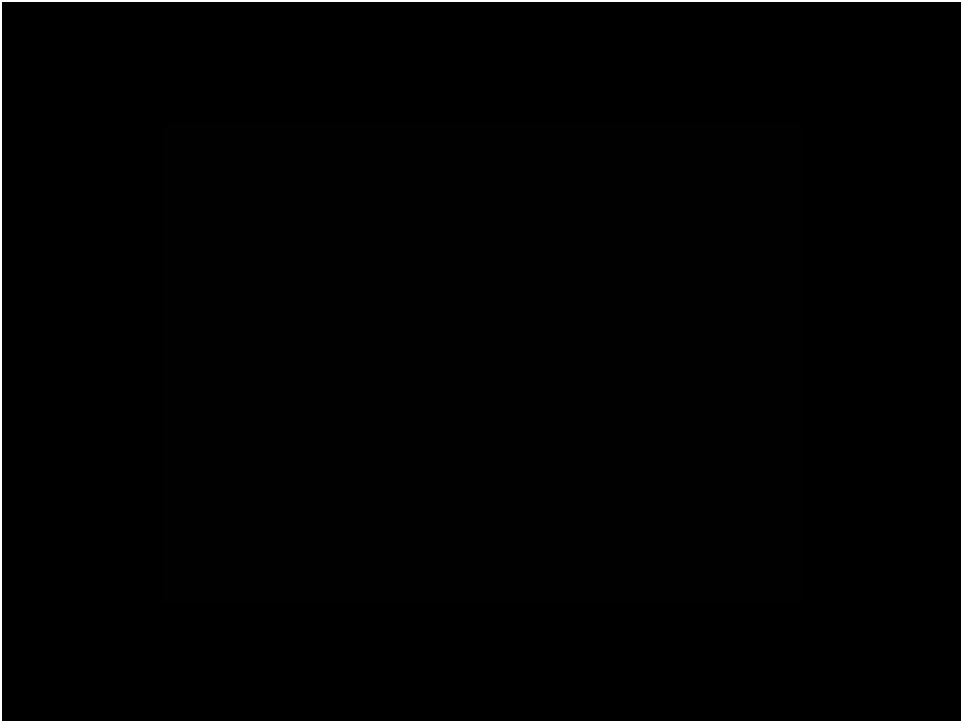


From Drowning to Survival: *A Resuscitation Case Study*

Jonathon Webber

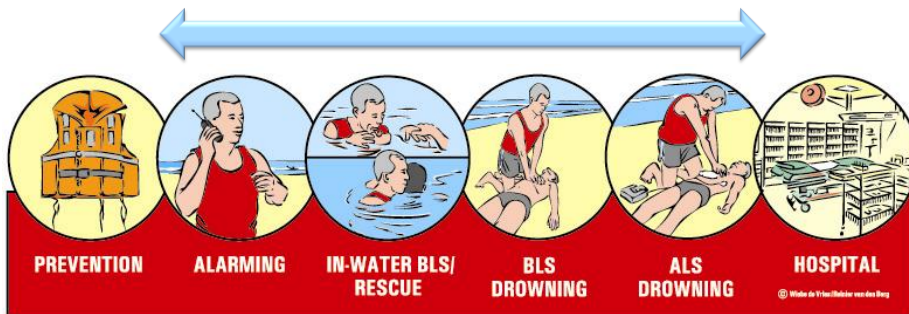




Drowning Terminology

- Over 30 different terms have been used to describe the process and outcome from submersion and immersion-related incidents
- To improve clarity and to help comparability of future scientific and epidemiological reports, new definitions related to drowning were published in **2003**. These definitions have since been accepted by the WHO
- Despite this some academics, health professionals, emergency services personnel and even lifeguards **continue to use the old terminology** (near-drowning, secondary drowning, wet/dry or active/passive drowning)
- The 'accepted' outcomes from drowning are: **Drowned, morbidity or no-morbidity**

Wet Chain of Survival



(Proceedings of the World Congress on Drowning, 2002)

Drowning Detection

Problem Statements

- Not all behaviour displayed in the aquatic environment is indicative of drowning (false positive)
- Preliminary research has identified caregivers, parents, bystanders and newly qualified lifeguards fail to recognise the **seriousness** of the behaviour they observe (false negative)



“Dead heroes can’t save lives”

Attempting Rescue

- In many case reports it is the person in distress that **survives**, and the **rescuer that drowns**
- DrownBase™ records **78 people** as having drowned in New Zealand while rescuing others from 1980-2010 (WSNZ 2010)
- This represents 1.8% of the total number of drownings during the same period (WSNZ 2010)
- Whilst extrication from the water is important, the **priority** is to provide buoyancy to a drowning victim as this interrupts the drowning process

In-water Resuscitation

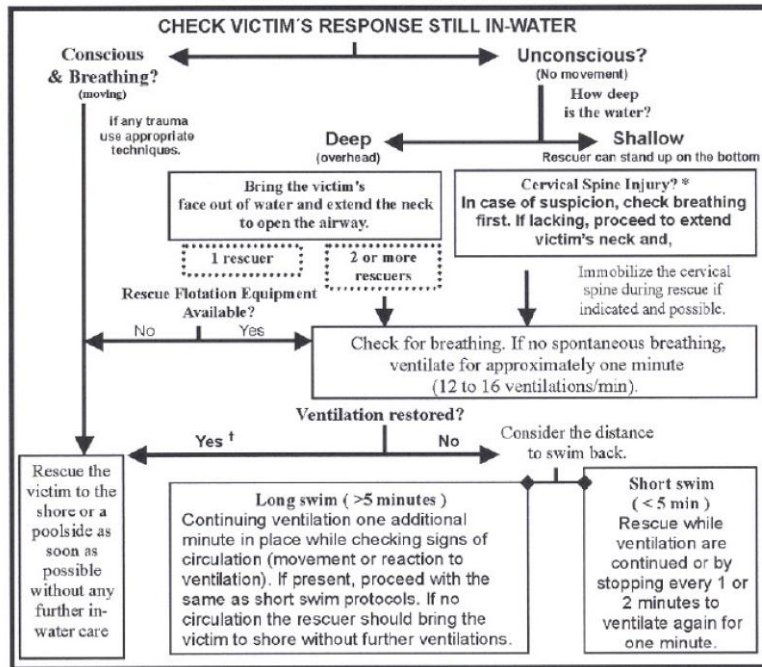
Evidence

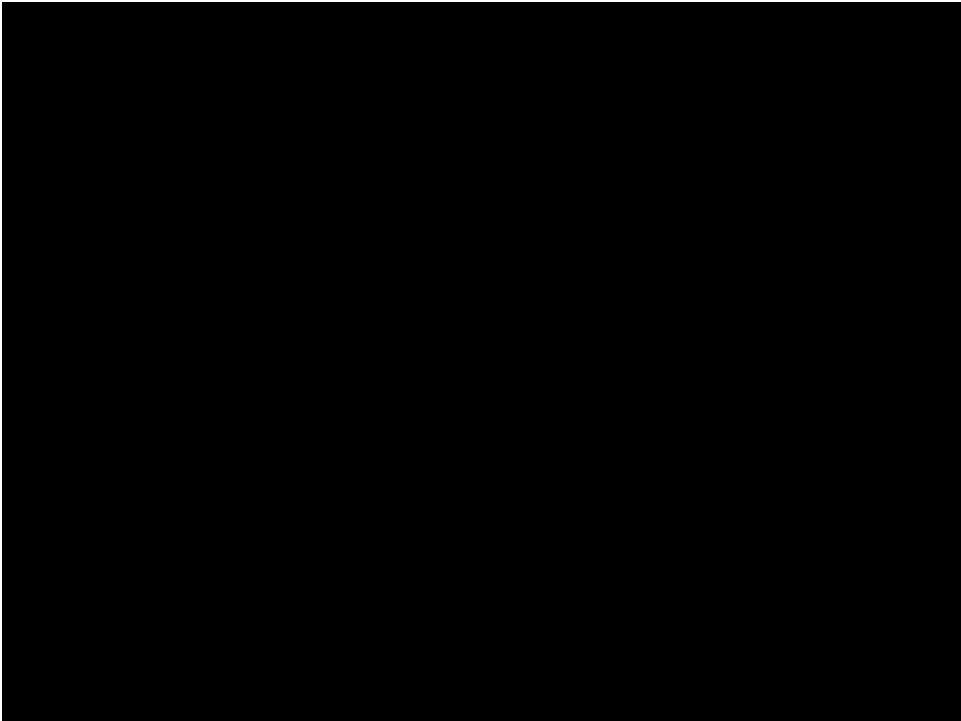
Although taught by various lifesaving organisations, this recommendation is supported by weak scientific evidence. In a retrospective study of 46 drowning cases requiring rescue/medical assistance, Spzilman et al showed that:

- Mortality was lower (15.8% versus 85.2%, $P < 0.001$) for victims who received IWR ($n = 19$) compared to those who did not ($n = 27$)
- Patients who received IWR were less likely to require additional resuscitation procedures on shore (52.6% versus 100%, $P < 0.001$)

Resuscitation 2004;63:25-31

IN-WATER RESUSCITATION ALGORITHM





Resuscitation from Drowning

General Principles

- The DRSABCD approach applies to all drowning victims
- Immediate resuscitation at the scene is essential for survival and neurological recovery after drowning
- Prompt initiation of rescue breathing and basic life support is more important than defibrillation and advanced life support interventions
- Victims who have spontaneous circulation and breathing when they reach hospital usually recover with good outcomes

Case Study

Initial Assessment

- There is no need to clear the airway of aspirated water. The majority of drowning victims aspirate only a modest amount of water.
- The routine use of suction equipment is **not supported** by clinical evidence
- As soon as the victim is removed from water, check responsiveness and breathing. If the victim is not breathing normally, start resuscitation immediately
- **In drowning** at least **2 initial breaths** should be given before starting compressions (ILS). ERC; 5 initial breaths, AHA; 2 initial breaths, **ANZCOR; no recommendation**
- **Compression-only CPR is not recommended in drowning** (AHA, ERC, ILS 2010)



Case Study cont..

Non-fatal Drowning Considerations

- Patients resuscitated, those with an altered level of consciousness, foam in the nose/mouth or difficulty breathing require ambulance transport to hospital. Consider calling for help **before** the victim is returned to shore
- Spontaneously breathing patients often froth. **Do not suction**; apply the mask and leave the froth to go in and out with the oxygen
- Administer oxygen at 6-8L/min via an acute mask or 10L/min via a bag-valve-mask and continue to monitor the patient's vital signs
- International Life Saving recommend right-sided recovery position (LOE 5)*



Supraglottic Airway Devices

LMA Unique™, LMA Supreme™, i-gel®, King LT®...

- Although now widely recommended for use in resuscitation and promoted by some manufacturers for pre-hospital use, there is no evidence to support the routine use of supraglottic airway devices **in drowning**
- Due to reduced pulmonary compliance, the high inspiratory pressures often required in drowning can result in ineffective ventilation from air leaking around the cuff or entering the stomach (ERC 2010)
- Effective bag-mask ventilation (or endotracheal intubation for ALS providers) should remain the mainstay of airway management until more data on the performance of these devices in drowning is available

Anaesthesia and Intensive Care

HOME CONTACT US SITEMAP LOGIN QUICK SEARCH Go

ABOUT THE JOURNAL AUTHORS ADVERTISERS SUBSCRIBERS

Welcome to *Anaesthesia and Intensive Care* Online

Anaesthesia and Intensive Care is an educational journal for those associated with anaesthesia, intensive care medicine and pain medicine

Latest Issue
Anaesthesia and Intensive Care
 Volume 39, Issue 2 March 2011

The Latest
 "Anaphylaxis to patent blue dye – misadventure or misdemeanour?" See this March Editorial in which Drs Platt and Roberts present important safety information and question the use of these dyes without pre-operative exclusion of allergy.

Top 10 viewed articles
 1. Equipment to manage a difficult airway during anaesthesia
 Volume 39 Issue 1
 Type Special Article
 Authors PA Baker, BT Flanagan, KB Greenland, R Morris, H Owen, RH Riley, WB Runciman, DA Scott, R Segal, WJ Smithies, AF Merry
 Pages 16-34

ARTICLE IN PRESS

Baker, P. A., & Webber, J. B. (2011). Failure to ventilate with supraglottic airways after drowning. *Anaesthesia and Intensive Care*, 39(4).



summer of the surf lifeguard
2010 - 2011

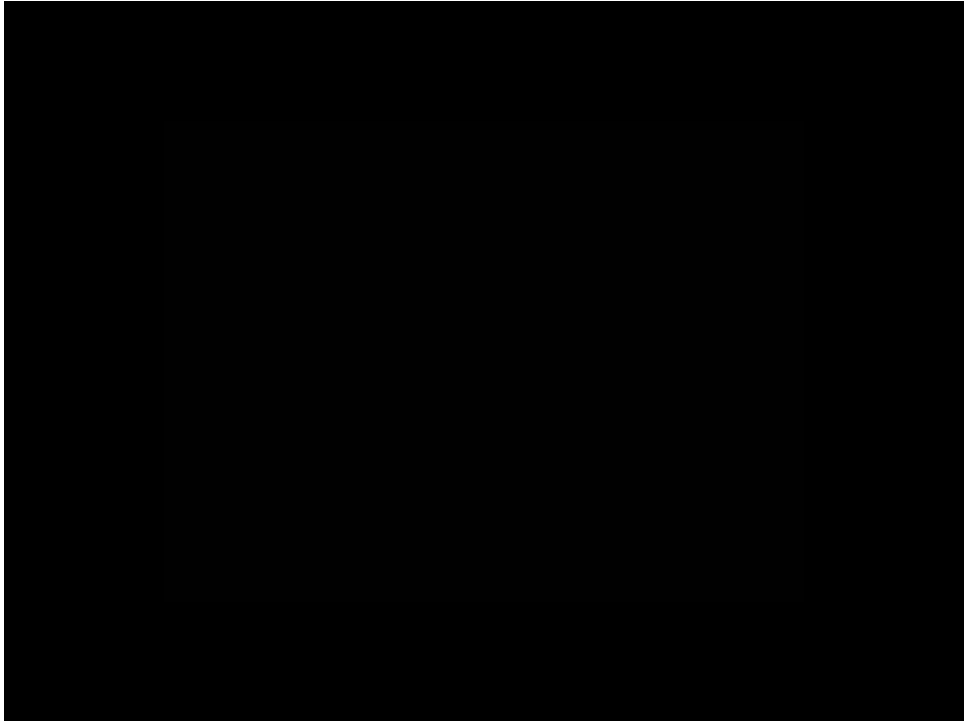
Space Blankets



Science Fact or Science Fiction?

- Foil blankets are commonly used to prevent/treat hypothermia **despite** inconsistent results of studies into their effectiveness (Chadwick et al 1997)
- One randomised controlled trial showed space blankets were less effective than two thin cotton blankets at maintaining normal body temperature perioperatively (Siew-Fong et al 2003)
- In contrast, the Mediwrap® blanket has been shown to be as effective as a forced air warmer at maintaining normal body temperature before and during surgery, and **more effective** after surgery (Rathinam et al 2009)





 **Years** | summer of the surf lifeguard
of volunteers 2010 - 2011

An Integrated Approach Saves Lives

With thanks to:

- Piha Surf Life Saving Club
- United North Piha Lifeguard Service
- SurfCom (Surf Life Saving New Zealand)
- Piha/Karekare First Response Unit
- St John Ambulance
- Northland Emergency Services Trust
- New Zealand Police
- Auckland City Hospital (Adult Emergency Department & Department of Critical Care Medicine)



SURF LIFE SAVING

Preventing drowning and injury in New Zealand