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Aquatic Rescue and PreHospital Management of Drowning - Concurrent Workshop Repeated

Sunday, 23 June 2013

Start 8:30am

Start 9:35am

Duration: 55mins

Duration: 55mins

Van Gogh

Van Gogh



 **Rotorua GP CME 2013**
New Zealand Medical Association

General Practice Conference & Medical Exhibition

20-23 June 2013 | Energy Events Centre | Rotorua



Rotorua GP CME 2013 Workshop:

Aquatic Rescue and Pre-hospital Management of Drowning



**Protecting our community
in the water**

In it for life



Drowning in New Zealand

A Serious Public Health Issue

- The third most prevalent cause of unintentional injury resulting in death
- Our drowning rate is **2.6 per 100,000 of population**
- *Australia's* drowning rate is **1.27 per 100,000 of population** (284 people drowned in the year ended 30 June 2012)
- **93*** New Zealander's drowned in 2012 and **176** required hospitalisation

Drowning Prevention Strategy

Towards a Water Safe New Zealand 2005–2015

Te Rautaki Ārai i te Toremitanga Kia Tupu ai a Aotearoa hei Whenua Haumaru ōna Wai 2005–2015



Hon Ruth Dyson



Minister for ACC



Implementation Plan 2007–2011



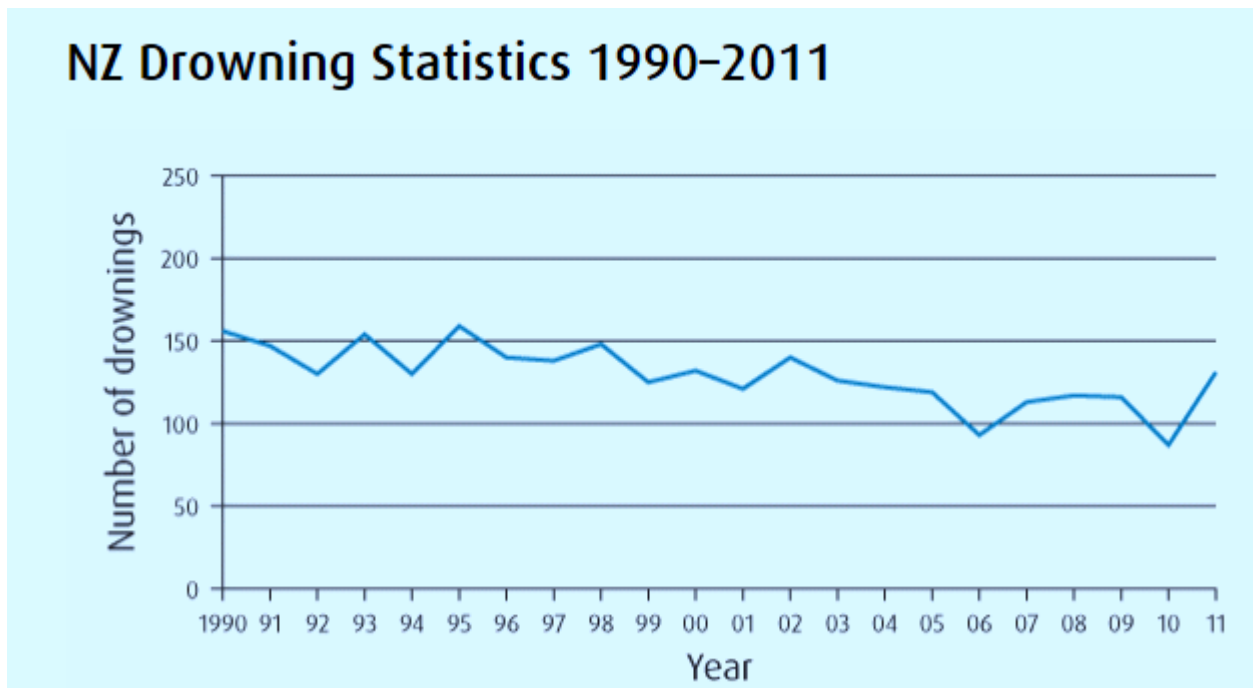
Causes of Drowning

The Drowning Chain:

1. Ignorance, disregard or misunderstanding of the hazard
Educate and inform
2. Unfamiliar or unrestricted access to the hazard
Provide warnings and deny access
3. Lack of supervision or surveillance
Extend lifesaving services as required
4. Inability to cope once in difficulty
Increase survival skills

So is it working??

2013 Provisional Drowning Toll: **39***



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Accepted Drowning Terminology

- ***Drowning:*** The process of experiencing respiratory impairment from submersion/immersion in liquid (WHO 2005)

The drowning process can be interrupted at any point and survival occur. The victim may live or die after this process, **but whatever the outcome, he or she has been involved in a drowning incident**

- ***Drowned:*** Death from drowning
- ***Other outcomes:*** Morbidity or No-morbidity (“non-fatal” drownings)



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Other Drowning Terminology

- ***Immersion:*** Part of the body is under water
- ***Submersion:*** The whole body is under water
- ***Witnessed:*** Drowning episode is observed from the onset of immersion or submersion
- ***Unwitnessed:*** Victim is found in water, no-one saw the event

Old (Abandoned) Terminology

- Near Drowning
- Secondary Drowning
- Active, Passive and Silent Drowning
- Wet vs. Dry Drowning
- Salt vs. Fresh-water Drowning

Wet Chain of Survival



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“You are the weakest link!”

Problem statements:

- How do you raise the alarm in a surf or aquatic emergency?
- How do we ensure the appropriate **local** resources are responded?
- **How do you recognise a drowning victim?**



Drowning Detection

Background

- Not all in-water behaviour is indicative of drowning
- Parents, caregivers and even some lifeguards can fail to recognise the **seriousness** of the behaviour they observe
- Adolescents (and non-swimmers) may not have the **cognitive ability** to recognise victims in distress
- Victims rescued by lifeguards require medical care **less often** than those rescued by bystanders (6% vs. 30%)



“We didn’t know he was drowning!”

In the latter stages of drowning, a victim:

- cannot call out for help because they're gasping for air
- cannot wave for help because they're fighting to keep from going under
- will extend their arms to the side and push down on the water's surface to keep their head above the water (Instinctive Drowning Response)
- often looks like they're playing around

Note: non-swimmers may submerge with no surface struggle. Children may “bob” head down, appear to be “dog-paddling” or just sink



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Strategic vs. Tactical Goals

Priorities in Drowning



- The **strategic goal** in drowning has, and always will be, to remove the victim from the water
- The tactical goal in drowning however, is to **interrupt the drowning process and prevent submersion**
- Most rescuers tend to focus on the **strategic goal**
- Victims can go from drowning, to distress or even **no-distress** as soon as **buoyancy** is provided

Attempting Rescue

“Dead heroes can’t save lives”

- In many case reports it is the person in distress that **survives**, and the **rescuer that drowns**
- DrownBase™ records **81 people** as having drowned in New Zealand while rescuing others from 1980-2012
- This represents 1.7% of the total number of drownings during the same period

So, should you attempt a rescue?

In my opinion...

No. Not unless you have been trained to do so:

- Avoid entering the water if possible. **Only enter the water with some form of flotation**
- Always use **non-contact tows**. Remember **you** are a source of buoyancy to a drowning victim
- In most cases, **providing buoyancy** to the patient will interrupt or stop the drowning process

Public Rescue Equipment (PRE)



Talk, Reach, Throw, Wade, Row & Tow



Talk



Reach



Throw



Wade



Row



Non-contact tow



Contact tow



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NO ENTRY









bondi rescue

danger and drama

main promo



▼ Bondi Rescue- Series 2



► Series returns- Mondays at 8pm

With more action, thrills and spills, the Lifeguards at Bondi Beach are back for a new season.

► [More on the show](#)

▼ The Lifeguards



► Lifeguards

► Hoppo

▼ TV Guide

▼ Mon Jun 4th [Schedule](#)

Not currently showing



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In-water Resuscitation

History



- First demonstrated in 1975 by New Zealand Lifeguards
- Recommendation in 1978 that: *“artificial ventilation with the aid of a flotation device should be employed whenever a **delay** in removing a non-breathing victim from the water could be anticipated”*
- No successful in-water resuscitation had been reported until 1981
- Although taught by various lifesaving organisations worldwide, this recommendation is supported by weak scientific evidence (Spilzman, 2004)



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Drowning Resuscitation

General Principles



- The DRSABCD approach applies to all drowning victims. Start CPR on any victim located within **1 hour** of being reported missing
- 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**

Drowning Resuscitation cont...

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 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**
- **Chest Compression-only CPR should only be used as an interim measure**

Supraglottic Airway Devices



A Word of Caution

- Although now widely recommended for use in resuscitation, there is **no evidence** to support the routine use of SGAs 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; Baker & Webber, 2011)
- **Effective bag-mask ventilation** (or intubation with a cuffed endotracheal tube) should remain the mainstay of advanced airway management in drowning
- The NZRC has indicated that endotracheal intubation is set to become a **Level 8** provider skill



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Non-fatal Drowning

Medical 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
- Most post-drowning “collapse” is due to **physical exhaustion** (fatigue) as opposed to breathing problems
- Patients with no cough or foam in the mouth or nose **can safely be discharged from the scene** with advice to see a doctor or call 111 if breathing problems develop (Spilzman, 2007)

SENTINEL SYSTEM FOR RESPONSE TO DROWNING

STATUS	ONE	TWO	THREE	FOUR	FIVE
Threat to Life	IMMEDIATE	CRITICAL	SERIOUS	MODERATE	LOW
Behaviour Displayed	Submerged or Unconscious	Instinctive Drowning Response	Distress	Early Distress	No Distress (Hazard Present)
Response Required	Urgent Rescue (multi-level) Buoyancy Support with in-water BLS Call for Ambulance	Urgent Rescue Buoyancy Support Rescue Assets on standby	Immediate Rescue Buoyancy Support (if required)	Routine or Immediate Rescue	Preventative Action or Routine Rescue
Drowning Classification	Unresponsive and not breathing normally	Large amount of foam in mouth or nose; breathing inadequate or decreased LOC	Large amount of foam in mouth or nose; breathing adequate	Small amount of foam in mouth or nose; lung sounds abnormal	Cough, with no foam in mouth or nose; lung sounds normal
Treatment	Start CPR Bag/mask with high-flow oxygen Attach AED	High-flow oxygen Monitor breathing Vital signs Recovery position	High-flow oxygen Vital signs Recovery position	Oxygen Warm and calm the victim Recovery position	Rest, warm and calm the victim Oxygen not normally required

STATUS FIVE PATIENTS WITH NO OTHER MEDICAL PROBLEMS OR INJURIES CAN BE DISCHARGED INTO THE CARE OF A RESPONSIBLE ADULT. IF IN DOUBT, ALWAYS CALL FOR AN AMBULANCE

Other Considerations

Suspected Spinal Injury



- Remove all drowning victims from the water by the fastest and safest means available, and resuscitate them as quickly as possible
- The incidence of spinal injury in drowning victims is low: ~**0.5%** (ERC, 2010)
- Spinal immobilisation in an open-water environment is **virtually impossible** to perform and will **delay resuscitation** of the victim

Immersion Hypothermia

Cold Shock is the Killer



- The three phases of cold water immersion have been described using the “**1 – 10 – 1**” phrase:
 - **Cold Shock: 1 minute** to focus on keeping your head above water (to avoid aspiration) and control breathing until the hyperventilation subsides
 - **Cold Incapacitation: 10 minutes** of useful muscle time to self-rescue, activate an EPIRB etc. before muscle cooling will impair performance
 - **Hypothermia: 1 hour** immersed in **ice-cold water** until a person will be rendered unconscious
- Far more people die from **drowning** than will ever die from immersion-related hypothermia

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)
- A sleeping bag wrapped in plastic sheet to form a “vapour-trap” is a much better alternative when improvised materials must be used



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Summary

- **Ensure all non-fatal drownings are recorded** (ACC read code SN41.) and use the **correct drowning terminology**
- Ask: **What can I do** to strengthen the 'Wet Chain of Survival' in my community?
- It is **physiologically impossible** for drowning victims to call or wave for help
- Only attempt rescue **with some form of flotation**
- Try and interrupt the drowning process **by providing buoyancy support to the victim**

Summary cont...

- Most lives are saved through prompt extrication from the water and **basic life support interventions**
- The efficacy of supraglottic airway devices in drowning **is not fully understood**
- **Ignore the froth** in breathing patients; administer oxygen and let it go in and out with each breath
- Space blankets **don't work**
- **The prevention of drowning will always be a far better cure than resuscitation from it**



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