

POLICY NO: M - 011

POLICY: FIRST AID MANAGEMENT OF AQUATIC NECK INJURIES

ORIGINAL POLICY: OCTOBER 1997

LAST REVIEW DATE: OCTOBER 2002

REVIEW DATE: CURRENTLY UNDER REVIEW

1. INTRODUCTION

Detailed statistics on the incidence and demographics of aquatic neck injuries are provided in RLSSA Policy No: M010, Prevention of Aquatic Neck Injuries.

Spinal injuries are common disasters and many of them involve the neck. The remainder are fractures of either the thoracic or lumbar regions.

Almost all aquatic spinal injuries occur in shallow water and involve the neck. Thoracic and lumbar fractures rarely occur in water. Most aquatic spinal injuries could have been prevented.

Most casualties are male with a great predominance of teenagers and men in their early 20's. Alcohol is a common factor.

Rescue from the water must be effected early as the casualty is usually face down and therefore suffocates within minutes. The lucky ones are able to walk from the water, simply complaining of severe neck pain. The unlucky ones will remain permanently quadriplegic.

Water rescue organisations round the world continue to grapple with the issue of how best to conduct preventive programs and how best to handle the casualty once the injury has occurred.

The International Life Saving Federation Medical Commission discussed rescue techniques in Cardiff in 1994 and conducted trials with the assistance of the director of the spinal unit in that city.

Directors of spinal injury units in Australia as well as rescue and medical experts from international aquatic organisations have been consulted in the formulation of this policy. The policy has been developed over a period of 10 years or more and the techniques have been extensively trialled both in Australia and overseas.

This policy does not describe the anatomy of the spinal column which is dealt with elsewhere in publications of the Society.

2. RECOGNITION

Aquatic neck injuries may occur in a variety of ways so that all lifeguards and persons involved in water safety must have a high index of suspicion.

1. **The conscious breathing casualty.**
The most common presentation is the person, usually young, **who leaves the water and immediately or very soon afterwards complains of a painful neck.** In these circumstances, the assumption of spinal injury must be made and the neck immobilised immediately by the most experienced persons on the spot using whatever means are available. There may also be limb symptoms such as pins and needles or weakness.
2. Less frequent is **the witnessed event** in which the casualty is seen to dive into shallow water or be dumped in the surf.
3. Third is the non-witnessed but highly suspicious circumstance where a person is found floating face down in or near shallow water or other potential danger areas as described in Policy No: M010.
4. Least suspicious, but still possible is any person found floating face down in deep water. Each of these must be managed as a potential spinal injury victim.
5. Spinal injury may involve only the bones, ligaments, etc, or, less frequently and more seriously, the delicate spinal cord itself, producing varying degrees of damage to nerve tissue. However, all spinal injuries must be managed by first aiders according to the same basic rules.
6. Other injuries might have occurred in the same incident. These include head injury and other musculo-skeletal injuries.

3. POLICY

Principles of Rescue and Treatment

1. First priority is to remove the person's face from the water while at the same time stabilising the neck in the neutral position. Removal of the casualty's face from the water is clearly the first step in creating a clear airway which must then be maintained at all times.
2. **Breathing must be assessed as quickly as possible** and this is done in the usual way. In practice, the presence or absence of breathing will usually be very obvious when the casualty's face is no longer covered by water.
3. **If breathing is absent**, rescue should proceed as a normal rescue and resuscitation, taking as much care of the neck as possible. **Resuscitation is much more important than a suspected neck injury when the casualty is not breathing.** The principles of Airway, Breathing and Circulation always take precedence over any suspected injury.

4. **If breathing is present**, the rescuers can usually be unhurried in their rescue. Wave conditions, the possibility of hypothermia, rocks, etc may dictate the need for speed and the lifeguards present will assess all of these factors.

At all times during rescue, the neck must be kept in the neutral position and the whole of the spine kept in normal alignment. If attempts to place the neck in the neutral position produce or aggravate pain in the conscious person, the neck should be immobilised in the position of comfort for that person. The neck should never be forced into the neutral position, but, if resistance is met, it should immobilised as is.

5. Recruitment of assistance is especially important in the unsupervised environment. Not all spinal injuries occur in guarded pools or at patrolled beaches. Removal of a spinal injury casualty from the water is very difficult unless there are adequate numbers of persons available to help. The most experienced lifesaver present should assume responsibility.
6. Without equipment, removal from the water requires a maximum number of assistants, care and lack of speed to ensure that the neck and the remainder of the spine are kept in position as described above.
7. In still water, the use of a suitable spineboard is recommended and has been standard practice around the world for many decades. The various types of spineboard are not easy to use correctly and special training is required along with annual recertification. For those such as lifeguards in a position of regular supervision of swimmers, frequent neck injury drill is essential.

The use of spineboards is detailed in publications of the Society.

8. The cervical collar was introduced into the management of aquatic neck injuries in Australia in the summer 1992-93 and teaching has proceeded systematically since that time, being restricted to specially trained lifeguards in the RLSSA and the holders of the Advanced Resuscitation Certificate in the SLSA. The cervical collar has been in use by overseas lifeguards for rather longer periods on the recommendation of their medical advisers.

It is therefore the policy of The Royal Life Saving Society Australia that cervical collars are appropriate adjuncts to the management of aquatic neck injuries provided that their use is restricted to those who have been specifically trained in their use.

The cervical collar is always used as an adjunct to and not a substitute for correct management of immobilisation, airway management and transport. It should not be used in a casualty who requires respiratory or cardiac resuscitation.

Full details of the use of the cervical collar are published in the book "Aquatic Spinal Injury Management" published by the Victoria Branch of the Society and in the SLSA Manual No 1, 1995, 30th Edition.

9. At the earliest possible time in the rescue procedure, ambulance, helicopter or other emergency medical service organisation should be notified.
10. Despite the best efforts of appropriately trained lifesavers in the management of aquatic neck injuries, spinal cord damage may still occur.

4. THE FUTURE

Over the past decade, Surf Life Saving Australia has developed a different lift in which the casualty is face down and this method is still under evaluation by the Society. The method has value in shallow water and in moving water as the casualty's face is removed from the water very promptly and there is less potential problem with vomitus and less problem with the airway if the casualty is unconscious.

The Society is encouraging groups to investigate possible integration of this simple method into techniques for still water but as yet no firm results are available.

Continuing liaison with Australian experts through the International network of RLSS countries and the International Life Saving Federation, monitoring of advances in techniques will result in changes if and when indicated.

5. REFERENCES

1. Albin, M.S., Acute cervical spinal injury. *Critical Care Clinics*, Jul 1985, 1 (2) p267-84
2. American Red Cross, *Lifeguarding Today*, Mosby Lifeline, St Louis, 1994
3. Brewster, B.C., (Ed) *The United States Lifesaving Association manual of open water lifesaving*, Prentice-Hall, Englewood Cliffs, 1995
4. Browner, C.M. & Prendergast, V., Spinal Cord Damage with Diving Injuries, *Critical Care Nursing Clinics of North America*. Vol. 3 No. 2, June 1991
5. Brunette, D.D. & Rockswold, G.L., Neurologic recovery following rapid spinal realignment for complete cervical spinal cord injury. *Journal of Trauma*, Apr 1987, 27 (4) p445-7
6. Buchanan, L.E., Emergency! First aid for spinal cord injury. *Nursing*, Aug 1982, 12 (8) p68-75
7. Castillo, R.G. & Bell, J., Cervical spine injury. Stabilization and management. *Postgraduate Medicine*, May 15 1988, 83 (7) p131-2, 135-8
8. Cotler, H.B., The treatment of cervical spine trauma: a century of progress. *Orthopedics*, Mar 1992, 15 (3) p279-83
9. Davne, S.H., Emergency care of acute spinal cord injury. *Journal of the American Paraplegia Society* Apr 1983, 6 (2) p42-6

10. George, J.E., Legal aspects of emergency treatment of the neurologically injured patient, *Emergency Medical Clinics of North America* Nov 1987, 5 (4) p649-60
11. Green, B.A., Eismont, F.J. & O'Heir, J.T., Spinal cord injury--a systems approach: prevention, emergency medical services, and emergency room management, *Critical Care Clinics*, Jul 1987, 3 (3) p471-93,
12. Greenhalgh, T. & Bielmaier, M., Spinal Immobilization in the Aquatic Environment, *Rescue*, July/August 1995, p34-41
13. Hall, W.J.; Green, B.A. & Coladonato, J.P., Spinal cord injury: emergency management, *Emergency Medical Services*, May-Jun 1976, 5 (3) p28-30, 32, 34,
14. Larkin, J., & Moylan, J., Priorities in management of trauma victims, *Critical Care Medicine*, Sep-Oct 1975, 3 (5) p192-5
15. Letters, *Journal of Emergency Medical Services*, April 1995
16. Mazolewski, P., Manix, T.H., The Effectiveness of Strapping Techniques in Spinal Immobilisation, *Annals of Emergency Medicine*, 23:1290-5, 1994
17. McCabe, J.B. & Nolan, D.J., Comparison of the Effectiveness of Different Immobilisation Collars. *Annals of Emergency Medicine*, 15:1, January 1986
18. McSwain, N.E., (Ed.) *Pre Hospital Trauma Life Support 2nd Edition*, Emergency Training, Akron, Ohio, 1990
19. Meyer, P.R. Jr & Sullivan, D.E., Injuries to the spine, *Emergency Medical Clinics North America*, May 1984, 2 (2) p313-29
20. Samples, T., Spinal Cord Injuries: The High Cost of Careless Diving, *The Physician and Sports Medicine*. Vol. 17 No. 7, January 1986
21. Sarant, G. & Chipman, C., Early Management of Cervical Spine Injuries, *Postgraduate Medicine*. Vol. 17 No. 6. June 1982
22. Schriger, D.L., Spinal Immobilisation on a Flat Backboard: Does it Result in Neutral Position of the Cervical Spine?, *Annals of Emergency Medicine*, 20:878-81, 1991
23. Selecki, B.R.; Berry, G.; Kwok, B.; Mandryk, J.A.; Riding, I.T.; Sewell, M.F.; Simpson, D.A. & Vanderfield, G.K., Experience with spinal injuries in New South Wales. *Australia & New Zealand Journal of Surgery*, Jul 1986, 56 (7) p567-76
24. Soderstrom, C.A. & Brumback, R.J., Early care of the patient with cervical spine injury. *Orthopedic Clinics of North America*, Jan 1986, 17 (1) p3-13,
25. National Injury Surveillance Unit, *Spinal Cord Injury Statistics in Australia*. 1992

26. The Royal Life Saving Society Australia, *Lifeguarding, 2nd Edition*, Mosby Lifeline, Artarmon, 1995
27. The Royal Life Saving Society Australia, *Policy No: M010 Prevention of Aquatic Neck Injuries*, RLSSA, Sydney, 1995
28. The Royal Life Saving Society Australia Victoria Branch, *Aquatic Spinal Injury Management*, RLSSA, Melbourne, 1993
29. The Royal Life Saving Society Canada, *Alert: Lifeguarding in Action 2nd Edition* RLSSC, Ottawa, 1993
30. The Royal Life Saving Society United Kingdom, *Aquatic Spinal Cord Injury Management*, RLSSUK, Studley, 1993
31. The Royal Life Saving Society United Kingdom, *Beach Lifeguarding*, RLSSUK, Studley, 1994
32. Toscano, J., Prevention of Neurological Deterioration before Admission to a Spinal Cord Injury Unit, *Paraplegia*. 26, (1988) 143-150