Status after treatment:	No neurological recovery. Fully independent in a wheel chair.
Medical history:	No previous medical or surgical history.
Present physical status:	Blood pressure - 120/80 Pulse - 72 Chest - without pathological finding Chest X-ray - clear Neurological - paralysed below T8.
Lung data:	Forced vital capacity (FVC) - 3.81 Forced expiratory volume in 1 second (FEV 1) - 3.321 FEV 1/FVC - 87%

A. passed the course successfully and performed all the exercises to the satisfaction of the instructors. He overcame initial respiration problems experienced when water entered his air ways, this was due to much reduced intercostal muscle use.

B.

Date of birth:	1956
Date of injury:	23/9/1978
Type of injury:	Motor cycle accident resulting in a traumatic aortic aneurism which has resulted in an incomplete paraplegia below T8.
Treatment:	Operation. Surgical repair of aorta followed by rehabilitation in the Spinal Injuries Unit of the P A Hospital.
Status after treatment:	No neurological recovery. Independent in a wheel chair.
Medical history:	No previous medical or surgical history.
Present physical status:	Blood pressure - 140/80 Pulse - 84 Chest - without pathological finding Chest X-ray - clear Neurological - paralysed below T8.
Lung data:	FEV - 5.11 FEV1 - 4 1 FEV1/FVC - 78%

B. passed the course of training successfully, and performed all the exercises to the satisfaction of the instructors.

Both candidates were elated at their open ocean diving success. They described a new confidence in the water and a readiness to try other aquatic activities now the fear of drowning had been overcome. Being able to use scuba and breath hold dive under the water acted as an "overkill" for previous fear of water. Now boating and fishing no longer embargoed by the fear of drowning. Both are keen to try subaquatic activities such as photography and marine biology. The social and environmental interactions were positive and important adjuncts to learning to dive. Future studies should assess improvements in self esteem.

This particular course of diving instruction had two main aims.

1. To acquaint the candidates with the theory necessary for safe diving, and also to train them in the practical aspects of scuba required for safe diving in enclosed swimming pools and in the open sea.

2. To integrate the course candidates, if possible, into able bodied dive clubs, and groups, to enable them to participate in the sport in the future. This second aim requires the training of supervisors for disabled divers as well as instructors to teach the disabled to dive. The Australian Underwater Federation (Queensland Branch) (AUFQ) club system and the Federation of Australian Underwater Instructors (FAUI) can play an important role to achieve these aims.

REFERENCE

1. Fleming NC and Melamed Y. Report of SCUBA diving training course for paraplegics and double leg amputees with an assessment of physiological and rehabilitation factors. *SPUMS J*. Jan-March 1977; 7(1): 19-34.

Another course for paraplegics will begin in December 1982 at the Cotton Tree pool, Maroochydore. At the time of writing, one totally blind male, one partially sighted male and one visually handicapped female are being trained.

An expanded version of this paper is available from the authors.

LETTERS TO THE EDITOR

University of British Colombia
School of Rehabilitation Medicine
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CANADA

25 October 1982

Dear Sir

In March of this year, a very enthusiastic group of five wheelchair athletes decided to learn to scuba dive. The group consisted of one left lower extremity poliomyelitic and four paraplegics, ranging from T2, a complete and an incomplete T5, and a T12. The complete T5 paraplegic had not participated in any sports activities since his accident, however, the other four were very active in all

aspects of wheelchair sports, such as marathoning and basketball. The Canadian Wheelchair Sports Association approached the diving community in Vancouver, which at that time had not heard of any other disabled individuals who were scuba diving. A pilot project was launched. Wheelchair basketball, marathoning and work commitments on the part of the candidates necessitated an intensive weekend course for the theory and pool sessions. A certified PADI instructor and a half dozen interested and enthusiastic assistants participated. Fairly quickly it became apparent that the candidates would have little difficulty in diving but that equipment and diving gear modifications would have to be made. The ocean checkout dives could not be done until the end of April (due to other sport commitments) and unfortunately, the diving conditions were not optimal at that time. However, the candidates' enthusiasm had not waned in the interval and two checkout dives were completed and all five candidates were given PADI certification. Again, it became apparent that two of the candidates would have minimal entry difficulties from the beach, but the other three would require carefully selected beach sites or boat assisted entries from beach sites.

At this point Dr Peter Graystone, of the School of Rehabilitation Medicine, and I started planning a research project to investigate the viability of teaching scuba diving as a therapeutic means of rehabilitating disabled individuals, particularly spinal cord patients, amputees and polio victims. We had determined that there was a need for adapted and special safety equipment, as well as specialized instruction techniques. From the experience gained in instructing, we expected to compile a resource manual offering instruction techniques for teaching disabled scuba divers. This would include information for the lay person (assistants) concerning the various disabilities and the problems encountered by the disabled individual as a result of the disability. We planned to interview other disabled divers about the problems they encountered while they were learning to dive, and to incorporate their suggestions for adapting equipment and mobility techniques.

During my preliminary research into this project, I found that there is a Handicapped Scuba Association in the USA and also that a NAUI group in Ontario, Canada, have produced a film entitled "Free Dive" which involved teaching several disabled children to dive.

Numerous applications for funding have been completed and we are now awaiting word from these sources. In the meantime, the two more ambulatory of our original group have gone on to become competent divers and the remaining three are eagerly looking forward to better diving conditions and assistance with equipment and dying gear modifications.

We would appreciate hearing from any of your readers, who have participated in a similar project. The writer may be contacted at the above address.

Yours truly,
Margaret Campbell

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USA

Dear Sir

AQUATIC RESCUE AND IN-WATER CPR

Because of the large number of drownings and near drownings that occur each year, there has been considerable interest in developing an effective method of performing in-water cardiopulmonary resuscitation (CPR). Recently, attention has focused on the method of aquatic CPR reported by March and Matthews and, unfortunately, a number of articles in the lay press have made it appear that the techniques described by these authors have been thoroughly tested and endorsed by the responsible medical associations. This is hardly the case.

Although they have reported some interesting preliminary trials, March and Matthews have not developed a satisfactory technique for aquatic CPR. Actually, it is debatable whether such is even theoretically possible. In their reports, March and Matthews (1,2) describe the results of six trained rescuers who performed single person in-water CPR on a submersible mannikin utilizing a specially calibrated scuba regulator for positive pressure ventilation and a horizontal, behind-the-victim position in which the rescuer provides the support platform and delivers external cardiac compressions by various cross-chest hand positions. Testing was carried out for 15 minutes in a swimming pool. During the in-water trials, the test rescuers demonstrated compression depths of 2.0 to 4.5 cm, compression rates of 34 to 48 deflections per minute, and respiratory rates of 6 to 8 ventilations per minute. Although some of the rescuers were able to achieve acceptable depths of compression, none was able to perform chest compressions and ventilations at currently recommended minimum rates for single rescuers.(3)

Given this and the fact that CPR performed by highly trained persons under optimal conditions provides only about 30% of the normal cerebral blood flow, it is unclear to me how they can claim that their "study shows that a trained person may successfully sustain a victim of cardiorespiratory arrest at the surface of an aquatic environment."(1,2)