

THE WORLD AS IT IS

A HISTORY OF RECOMPRESSION FACILITIES IN VICTORIA, PART 1

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Key Words

History, hyperbaric facilities.

Hyperbaric medicine in Australia has largely arisen out of the need for decompression chambers to be available for the treatment of decompression sickness in divers. Two notable exceptions were the chambers established in Sydney at the Prince Henry Hospital and in Melbourne at the Peter MacCallum Clinic. The former was a large chamber designed for cardiac surgery under pressure. When this use was superseded by the introduction of cardiac bypass machines, the chamber continued in service as Australia's early home of hyperbaric medicine. The system has recently been refurbished and relocated to the Prince of Wales Hospital in Randwick. The Peter MacCallum chamber was a monoplace chamber designed to allow the administration of radiotherapy to patients who were pressurised and breathing 100% oxygen. Early work had suggested that HBO might act as a radiosensitiser, increasing the effectiveness of the radiotherapy in killing cancer cells. Unfortunately this promise failed to be fulfilled and use of the Peter MacCallum chamber was abandoned.

In the later 1970s and early 1980s a Vickers acrylic hull, monoplace chamber was located at Prince Henry's Hospital, Melbourne. This provided treatment for a small number of gas gangrene patients, divers and others for a number of years until the Alfred facility was established in 1987. A further Vickers monoplace chamber was to be installed at the Royal Melbourne Hospital but it was never removed from its packing case! It spent some time in the Fremantle Hospital before finding its way, recently, to the Prince of Wales hyperbaric facility in Sydney.

On various occasions treatments were also provided in Melbourne using chambers operated by the Board of Works in support of pressurised tunnelling operations and using commercial diving chambers at the wharves.

Meanwhile, in eastern Victoria, diving medicine expertise was being developed to support the Bass Strait off-shore oil industry and the abalone divers of eastern Victoria and southern New South Wales. Dr Geoff Macfarlane, a general practitioner and GP anaesthetist based in Bairnsdale, undertook training in Scotland and established the Bass Strait Medical Centre with a number of his colleagues. In addition to diving medical examinations and health surveillance, this group provided the medical

direction for treatment of decompression illness using recompression chambers located on oil rigs, pipelaying barges and at the Abalone Divers Co-operative at Mallacoota. Inevitably this expertise was called upon for the treatment of a growing number of recreational scuba divers. At the same time the number of commercial divers who developed problems declined as safety standards improved.

In the early 1980s, a long established and well respected safety promotion organisation, the National Safety Council of Australia, Victorian Division (NSCA) became involved in the provision of rescue, firefighting and industrial emergency services in support of power station construction in the Latrobe Valley. The NSCA Emergency Services group grew rapidly and became a provider of emergency services resources to the official emergency services, the military and industry. In addition to rescue, ambulance and firefighting helicopters and an industrial emergency services group, a small diving group was established. This expanded with the acquisition of the Underwater Training Centre from Cronulla in southern Sydney. This acquisition brought with it a twin lock recompression chamber that had been manufactured by the Vidor company in Newcastle, NSW. This was soon joined by another twin lock chamber that had been used by the French commercial diving company Comex in Bass Strait, a further second hand chamber from South Wharf in Melbourne and a Dräger Duocom, a small two person, transportable rescue chamber.

After the saturation treatment of one critically ill civilian diver, on a pipelaying barge, had cost Esso over \$2,000,000, it became clear that, with land based chambers and experienced chamber operating staff, the NSCA was well placed to accept responsibility for recompression of diving casualties. Medical management continued to be provided by Dr Geoff Macfarlane and his Bairnsdale colleagues until the NSCA employed its own medical staff in 1984 and sponsored their initial training in diving medicine. The NSCA's first doctor, Dr Ian Millar, gained valuable experience from Dr Macfarlane and his colleagues and subsequently went on to join the staff of the Alfred and become Head of the Hyperbaric Service.

The NSCA had mounted the old South Wharf commercial diving chamber on a semi-trailer to create a relocatable emergency treatment facility. This chamber was used for the treatment of a number of Victorian decompression illness cases, culminating in a three day saturation treatment for a casualty of extreme depth scuba diving in early 1984. The quadraparetic, shocked patient had displayed deterioration during depressurisation following an initially promising response to pressurisation to 50 m. Dr Macfarlane and ex-Navy diver Tom Keogh

were confined inside the 1.8 m (6 ft) diameter twin lock chamber for the three days. Truckloads of mixed gas were brought in to create and maintain the reduced oxygen environment necessary to avoid oxygen toxicity for the attendants. The necessary logistic support was pieced together in the Latrobe Valley airport hanger in which this saga unfolded. A Navy team was flown in to assist and direct the treatment, led by Dr Des Gorman and John Pennefather. Carbon dioxide absorption was achieved in various ways including spreading soda lime around the chamber, pumping air through a canister, using a Zodiac inflatable boat pump, and breathing from the mouthpiece and by using hose and canister assemblies taken from Navy oxygen rebreather diving sets. During the second day and night of this emergency, the Comex and Vidor chambers were linked together by the NSCA in order to provide a more appropriate saturation treatment facility. This was an extraordinary demonstration of the ability of the NSCA Chief Executive (John Friedrich) to make things happen, with engineers, welders, cranes and the local pressure vessel inspector involved in the cutting of a flange from the side of the Comex chamber to use in the manufacture of a connecting spool piece to link the chambers.

The joined Comex and Vidor chamber complex at the Underwater Training Centre in Morwell became the main recompression facility for Victoria from 1984 – 1987. The trailer mounted chamber was relocated to the Royal Adelaide Hospital where it was operated by NSCA staff until a new Dräger twin lock chamber was purchased. The mobile chamber was subsequently relocated onto a diving support vessel but after the liquidation of the NSCA it returned to commercial diving service. Later it was used in support of the construction of the Sydney Harbour tunnel.

The number of diving emergencies presenting for treatment grew each year and with knowledge of developments in hyperbaric medicine overseas, it became apparent that Victoria's principal hyperbaric chambers should be in a public hospital, preferably a large teaching hospital. In 1987, the NSCA moved its main base of operations from the Latrobe Valley to the West Sale Aerodrome. This increased pressure for a move of the now isolated Morwell decompression chamber complex. In addition to lobbying the Health Department, a number of Melbourne hospitals were contacted directly. Only at the Alfred and Prince Henry's were individuals found with an interest in acquiring this unusual service for their Hospital.

Prince Henry's had been the Melbourne home of hyperbaric medicine for some years with its monoplace chamber and access to diving industry multiplace chambers on various occasions. However, plans for the closure of Prince Henry's were afoot and when Dr David Tuxen, Director of Intensive Care at the Alfred, showed interest, the choice of became obvious. In addition to its clinical services, the Alfred offered the best helicopter access with Fawkner Park adjacent.

The proposal to relocate the chambers was not accepted immediately, however, as the Health Department showed reluctance, presumably because it had been not at all unhappy that the NSCA had been carrying the costs of treating most divers. As a result, the closure of the NSCA Morwell facility saw divers flown to Royal Adelaide Hospital for some months, often in transportable, two person Dräger Duocom chambers. This period saw Dr Ian Millar and his NSCA colleagues gain some of the most extensive experience in the world in the operation of transportable, transfer under pressure systems.

Other key players in the process of lobbying the Health Department over this period were South Pacific Underwater Medicine Society members Drs Chris Lourey, John Knight, David Brownbill and Des Gorman.

When the Comex and Vidor chambers were finally relocated to the old South block at the Alfred Hospital in November, 1987, Ian Millar and his NSCA deputy medical officer Malcolm Osborne were appointed as Visiting Medical Officers. They provided specialist input into the establishment of the Hyperbaric Service along with NSCA hyperbaric technician Tom Nalpon. With Department Director, Dr David Tuxen and Charge Nurse Mandy Wilson, The Alfred Hyperbaric Service was born.

The use of the chambers grew rapidly, creating particular challenges for all involved in treating critically ill, ventilated patients in the traditional diving industry, cylindrical, circular manway decompression chambers. The numbers of elective hyperbaric medicine patients and divers continued to expand also, taxing the capabilities of the system. One more saturation recompression treatment was undertaken in the facility, this time an air saturation at 18 m. The support available in the hospital made this a significantly easier logistic exercise than the previous one, although the nursing and medical care for the severely embolised, unconscious, ventilated patient taxed all concerned.

In March 1989, the NSCA collapsed financially and was subsequently went into liquidation when it was discovered that the resourcefulness of John Friedrich had extended to innovative and unsustainable financing and not just highly competent emergency services operations. The chambers that had previously been on "permanent loan" from the NSCA were sold to the Alfred by their new owners, the liquidators of the NSCA. The Hyperbaric Service became a wholly Alfred Hospital owned and operated facility by employing the, by then unemployed, NSCA technical staff.

Part 2 of this paper will appear in the September issue of the SPUMS Journal.

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