Fixed wing ambulance transfer is not usually contemplated for such a short flight but given the constraints above was considered. Such a vehicle enables sea level cabin pressure on the return leg and a paramedic/nurse crew which may be supplemented by a retrieval medical officer if required. There is a 15 minute road ambulance trip from the hospital to the local airfield. Total time from hospital arrival to compression would be about 3.5 hours.

OUTCOME

Because of the expected return in the hours of darkness, the unwillingness to consign the patient to a lengthy road trip without specialist attendants and little evidence that his symptoms were settling with first aid measures, it was decided to transfer the patient by fixed wing aircraft. This expensive option was, in fact, subject to unavoidable operational delay and the actual interval from symptom onset to compression was 7.5 hours. He was treated initially with an RN Table 62 with rapid resolution of symptoms and required one further short table before being discharged well. He reported no return of symptoms and continued well and resumed his diving six weeks after the incident.

Conclusions

The retrieval of diving injuries can be complicated by a number of factors which impinge on the decision as to which transport method is most appropriate and the level of medical attendance required. Rational choice depends on the retrieval decisions being taken by those with experience both in the primary pathology and the practicalities of the retrieval system.

It is not yet possible for decisions to be made on the basis of good evidence as to which strategies provide optimal outcomes. Further investigation as to the important, modifiable determinants of such outcomes (if any) is needed.

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NORTHLAND RESCUE HELICOPTER HI-LINE TRANSFERS

John Knight

Key Words

Accidents, equipment, rescue.

During the 1997 SPUMS Annual Scientific meeting the Northland Emergency Services Trust (NEST) helicopter lowered, and recovered, a crewman onto one of the diving vessels, during the mid-day surface interval, as a demonstration of how helicopter rescue of divers is performed. This paper includes information taken from the NEST poster display and pamphlet available at the meeting.

Being under a hovering helicopter is very windy and noisy and conversation is difficult without a loud-hailer. Being rescued from a boat is much more comfortable than being rescued from the sea or a life raft. In my experience a small life raft is blown along by the helicopter down draft making it difficult for the rafter to reach the strop. After five attempts to bring the stop within reach had failed I went into the water, the Solent in February, and swam to the strop. Being lifted out of the water was wonderful, but being winched up, dangling unable to help oneself, was still a scary experience. How much easier would it have been using if the Royal Navy had been using modern techniques, lowering a crewman to assist the casualty, back in 1954.

Using the Hi-Line technique described below the arrival of the helicopter crewman was a swift and simple operation. The weighted line was dropped (Figure 1), when the helicopter was well clear of the ship's various overhead obstructions, onto the dive boat bow, where the boat crew hauled in the line until it was tight. Then the helicopter moved to one side of the boat and the winchman prepared to descend. As the winch cable was paid out the boat crew maintained tension on the Hi-line so pulling the crewman towards the boat, over the guard rail and onto the deck. Here he disconnected himself from the cable. After a short

Figure 1. The NEST helicopter approaching the dive boat with the winchman standing on the skid holding the weighted Hi-line.

Figure 2. The NEST helicopter approaching the dive boat with the weighted Hi-line hanging free.

presentation in the cabin the winchman did the reverse journey. The weighted Hi-line was recovered to the helicopter and it wheeled away to Whangarei while the dive boat moved off for the afternoon dive.

The text below and the diagrams are taken from the NEST handout on Hi-line transfer.

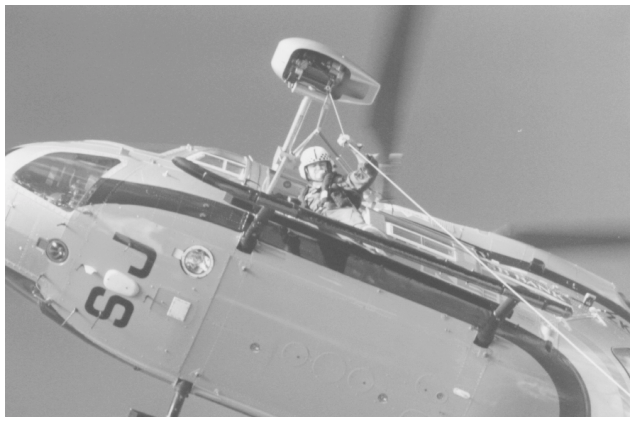


Figure 3. The NEST helicopter with a crew member holding the winch cable while the winchman was hauled inboard.

The Northland Emergency Services Trust helicopter is a Kawasaki BK 117 based at Whangarei and equipped for Emergency Medical Service and Rescue operations. It is winch equipped and capable for positioning paramedic staff into inaccessible areas or vessels at sea, recovering patients back into the helicopter and delivering them to suitable medical care. This service may be initiated through the emergency 111 system by requesting Ambulance as the desired service or initiating the same request through Coast Radio Stations. This service is provided on a no cost basis in the case of illness or injury.

Winching to high-masted vessels or vessels with obstructions such as cranes and gantries creates a degree of difficulty for the standard vertical lift, particularly in heavy seas. In most such cases the Hi-line technique is used, both by military and civilian Search and Rescue (SAR) units.

Initially the helicopter will contact you on Channel 16 and may request you to change to a working channel.

Normally you will be required to lower your sails and keep steerage way with the wind approximately 30° on the Port bow, but wind speed and direction, sea state, position of the transfer area and manoeuvrability of the vessel may necessitate variations to the above. In any case, the helicopter should hover into the relative wind and care should be taken that variations in the vessel's course do not prejudice this during transfers.

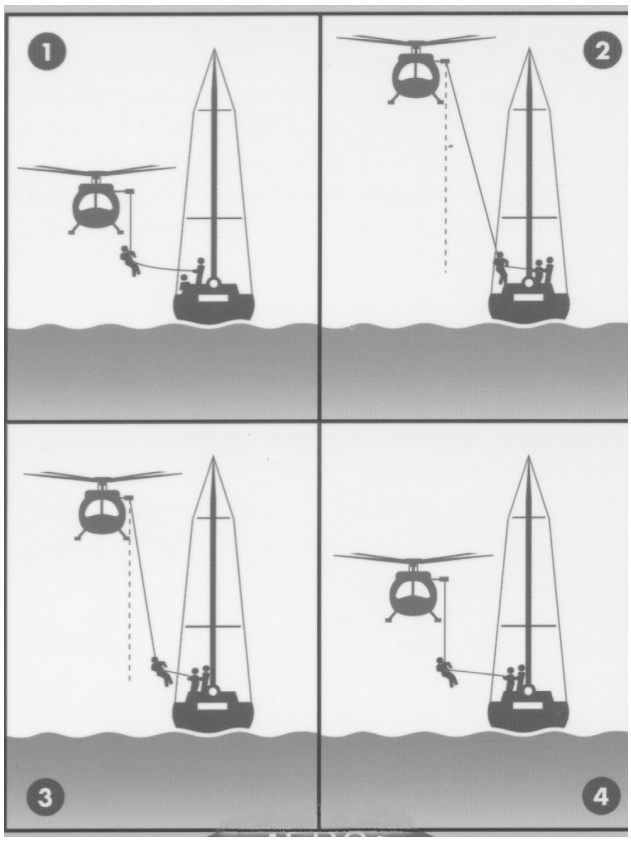
The transfer area should be selected to give as clear an area as possible with unobstructed access to the deck edge. Normally the vessel's Port quarter is used although circumstances may dictate otherwise. The helicopter crew will advise you where the transfer is to take place.

The "Hi-line " itself, is a 120' length of 1/4" braided nylon line. A screw gate karabiner is attached to both ends. The top end has a weak link and is attached to the helicopter winch hook. The bottom end is weighted.

The weighted end of the line is lowered to the deck of the vessel. If available, two deck crew should receive this and take in the slack, coiling loose line onto the deck or better still, into a bucket clear of obstructions.

THE HI-LINE MUST NEVER BE ATTACHED TO ANY PART OF THE VESSEL !!!

Tension on the line should be maintained to keep the line taut. Do not heave-in the line at this time. Deck crews are advised to wear gloves whilst handling the Hi-line (Diagram 1)



Once the line has been taken by the deck crew, the helicopter will move away from the vessel to prepare the winchman for lowering to the deck. At this time the deck crew must pay out the Hi-line. After winching out the winchman, the helicopter will climb to a safe height over the masts and obstructions whilst lowering the winchman to keep him level with the transfer area. The deck crew should take up the slack in the Hi-line so that the winchman does not swing.

The helicopter will then move towards the transfer area. Now the deck crew must continue to take up the slack and on the signal from the winchman, haul him on board (Diagram 2). When the winchman is on the deck, he will disconnect himself from the winch hook and the helicopter will move away from the vessel. The deck crew should now pay out the Hi-line. The winchman will brief the deck crew on any requirements.

For recovery, the winch hook is pulled in board to allow the casualty and the winchman to be attached. They will then be lifted off the deck. The deck crew should retain tension on the Hi-line to prevent excessive swinging (Diagrams 3 and 4).

Once the winchman and casualty are inside the helicopter, the Hi-line will be recovered by taking up the Hi-line until only the weighted end is left on the vessel. The deck crew should clear the weighted end from all obstructions and the Hi-line will be fully recovered by the helicopter crew.

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IS 100% OXYGEN NECESSARY IN THE EMERGENCY MANAGEMENT OF DECOMPRESSION ILLNESS?

Chris Acott

Key Words

Accident, decompression illness, first aid, oxygen, retrieval, treatment.

Abstract

Surface oxygen is now considered an essential component of the emergency management of decompression illness (DCI). Data suggest an improvement in pre-treatment symptoms, however outcome data are inconclusive. Frequently the FiO_2 in the emergency management is unknown and perhaps any concentration of