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SURVEY UNDERWAY ON BONE NECROSIS

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While diving is considered a reasonably safe endeavour, knowledgeable participants maintain an awareness of various potential hazards. The unexpected occurrence of decompression sickness on a "safe" decompression table is an ever present possibility; the enhanced possibility of decompression sickness from deeper and/or longer dives is well documented. Air embolism from improper exhalation while surfacing is always possible. Barotrauma with resultant ear and/or sinus involvement is also a constant possibility in any dive. While these possibilities are always present, they are all therapeutically manageable if adequate planning and precautions are taken.

There are diving problems that are not always recognized. Hearing loss and deafness have been recognized as possibilities that are under investigation for understanding, management, and prevention. The long-term consequences of central nervous system involvement in diving accidents are also of increasing concern. Currently being evaluated are the possible effects of diving on a diver's hones.

Bone abnormalities with the characteristics of aseptic bone necrosis or dysbaric osteonecrosis have been found in divers throughout the world. A survey for the presence of bone abnormalities, as determined by X-ray techniques, has been in progress in the US Navy for a number of years. In accordance with recent requests from the Diving Research Branch, Naval Submarine Medical Research Laboratory (NAVSUBMEDRSCHLAB), a number of active duty divers have been and are being surveyed radiologically for the presence of bone abnormalities. Various facts are gradually becoming evident from this survey.

Bone abnormalities consistent with the characterization of dysbaric osteonecrosis or aseptic bone necrosis have been found in some active duty divers. The exact percentage of cases is not yet known, but the occurrence of disabling bone abnormalities appears to be quite low (less than 0.45 percent). One or more incidents of decompression sickness do not seem to predispose the diver to the occurrence of bone abnormalities; nor does a diver's age appear to be related to the occurrence of this condition (within the normal age range of divers). No apparent correlation between the occurrence of bone abnormalities and the diver's NEC designation has been established for NEC's 5311, 5342, 5343 and 8493. These conclusions are based on preliminary data and will require additional input for verification. The causative factors that lead to the occurrence of bone abnormalities are not known at this time.

The effective pursuit to understand this subject is a task utilizing many Navy resources. Direction and guidance in the medical management of existing problems is a function of the Bureau of Medicine and Surgery. An active survey to establish a true incidence of this condition and to understand causative factors has been assigned to the NAVSUBMEDRSCHLAB at the Submarine Base, Groton, Connecticut. Objective diving data is supplied by the Naval Safety Center via the OPNAV Form 9940 input. Consultation services are provided by many facilities, including the National Naval Medical Center and the Armed Forces Institute of Pathology. In addition, an international group of experts is actively involved in finding the best possible approach to understanding and managing this problem.

The participation of many individual divers, the co-operation of various commands and activities, and the continuing involvement of many facets of the US Navy's biomedical research program are directed toward the safety of the individual diver in his duties. Doubtless there will be discussion and concern among Navy divers coincident with this official activity; rumors may circulate in various quarters about a variety of possibilities. To ensure an adequate presentation of reliable information, periodic status reports will appear in Faceplate. The purpose of these efforts is to assure participants that diving remains a safe endeavour, if standard precautions are observed.

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LCDR Adams has kindly offered to supply further information on the progress of this investigation at a later date.

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AN EXPOSURE TO RISK REGISTER FOR COMPRESSED AIR WORKERS

PD Griffiths

Trans. Soc. Occup. Med. 1971; 21: 123-125

The assessment of risk to which men in industry are exposed can be a thankless task because of the large number of variables and lack of essential data.

The hazards to which men are exposed when employed in compressed air in tunnels and caissons, and as divers, and known originally under such names as Divers' Palsy and Caisson Disease have been realised for very many years and considerable research concerning the aetiology and prevention of decompression sickness, as it is now called, has been carried out in the past, in particular by Paul Bert in Paris around 1870, and at the beginning of this century by Professor Haldane.

In 1945 the Ministry of Labour and the Institution of Civil Engineers decided to revise the Compressed Air Regulations, and it was then realised that very little was known about the risk involved and the reaction of men when actually employed in high working pressures, sometimes exceeding 40 psig on a civil engineering contract.

The first serious investigation of such a contract was carried out on the Tyne Pedestrian Tunnel 1948-1950 by Professor Walder and Professor Paton on behalf of the