



# MAXIMISING PERFORMANCE AND SAFETY

PROFILE



TEXT BY

**LTC (DR)  
JEREMIAH CHNG**

LTC (Dr) Jeremiah Chng is Head of Naval Underwater Medicine Centre. He oversees the diving and hyperbaric medical support for all naval underwater operations and drives the research and development of underwater medicine in the RSN. He completed his Masters in Public Health in 2012 and is an occupational medicine specialist.

## UNDERWATER MEDICINE

The birth of underwater medicine in Singapore can be traced back to the 1960s when the Republic of Singapore Navy (RSN) received her first hyperbaric chamber. Since then, the Navy Medical Service (NMS) has regularly sent medical officers (MOs) to the United States, Canada and Australia for training in diving and hyperbaric medicine. By the end of the 20th century, NMS had established a robust medical support system for military diving and submarine operations, as well as a 24/7 emergency hyperbaric oxygen treatment capability for all recreational and commercial divers operating in Singapore and the region. As the only national resource in hyperbaric medicine, NMS also provided medical consultancy in compressed air works to support projects such as the construction of underground tunnels for the Mass Rapid Transit projects in the 1980s and 1990s.

Diving and hyperbaric medicine is a specialised field of medicine that deals with the physiological effects of working “under pressure” in the underwater environment. Failure to accurately diagnose and treat diving-related injuries may result in permanent injuries or even death.

Till this day, very little of diving and hyperbaric medicine is taught in medical school. Therefore, all our MOs

need to undergo an intensive two-week underwater medicine course to equip them with the fundamental skills and knowledge. In fact, we have extended the course to benefit doctors practising in the public sector and doctors from the region. The course was renamed Singapore Hyperbaric and Underwater Medicine Course and is conducted once a year. It is accredited nationally by Ministry of Manpower and accredited internationally by the Diving Medical Advisory Committee.

The development of underwater medicine has expanded tremendously since the first RSN submarine, RSS *Conqueror*, started operation in 2000. The RSN now boasts a state-of-the-art submarine rescue vessel, MV *Swift Rescue*, and NMS operates a full suite of three multi-place hyperbaric chambers, a high dependency ward and a general ward to support treatment of submariners from distressed submarines.

The development of deep expertise in submarine medicine, as part of underwater medicine, ensures that our MOs are able to support current and new RSN submarines and to develop Singapore as a regional submarine rescue hub. Our close collaboration with Singapore General Hospital Hyperbaric and Diving Medicine Centre has also enabled NMS to continue to contribute at national and regional levels by providing essential 24/7 emergency treatments to SAF military divers as well as recreational and commercial divers.

## MILITARY SPORTS MEDICINE

Military sports medicine in the SAF started in the early 1980s, with the establishment of the Physical Performance Laboratory, which functioned as a centre for exercise stress testing. Over time, the evolution and expansion of roles and functions saw the emergence of physiotherapy services being provided, and the entity was renamed Soldier Performance Centre (SPC) in 1988. Today, SPC has expanded to include three sections – sports medicine, performance maximisation and occupational health.

Military sports medicine is important to the SAF given the physically demanding nature of military training and the varying physical fitness level of full-time National Servicemen prior to enlistment. SPC's programmes and initiatives have contributed significantly to training safety, musculoskeletal and heat injury prevention and management,

## AVIATION MEDICINE

Aviation medicine has its foundations in the physiology and psychology of man in flight. It is the science of how man affects flight and vice versa.

It is omnipresent in the business of aviation – from the selection of a potential aviator candidate to the optimisation of performance and enhancement of aircrew safety, down to tailored and elaborate treatment plans, even for the most common ailments.

Aviation medicine in the military is like a close sister to sports medicine, where the athlete reaches speeds greater than the speed of sound in a pressurised vessel while enduring G-forces up to nine times his body weight, which threatens to hurl him into unconsciousness.

It is the elegant balance of maximising performance and safety through monitoring, education and research. Processes such as

performance maximisation and obesity management.

To equip our medical personnel with the appropriate skills and knowledge, the SAF sends regular MOs for overseas programmes to further their education in this emergent field. Currently, regular MOs who specialise in sports medicine undergo the Subspecialty Training Committee's Sports Medicine Training Programme.

SPC has also developed a Military Sports Medicine Training Programme for all Army regular MOs to equip them with core competencies in the areas of prevention and management of heat and musculoskeletal injuries in the military, and in soldier performance maximisation. The programme involves participation in sports medicine, physiotherapy and podiatry clinics, laboratory-based practicum sessions, and research projects. Additionally, all regular Army MOs attend a six-month postgraduate diploma course in sports and exercise medicine at Queen Mary University of London.

annual medical screenings, spatial disorientation training and fatigue management research work in tandem to ensure the aviator is medically fit, primed for optimum performance and armed with the right skills to overcome the specific psychological factors experienced in flight.

Additionally, psychological assessment of the mental and emotional states of pilots is equally important. Understandably, it is possible to lose the licence to fly based on the severity of a medical or psychological condition. Hence, there is the unique challenge of building rapport and trust with the patient so that open reporting becomes a culture.

Aviation medicine, though vast, is undoubtedly still in its infancy. The future in space travel ensures the continued growth and development of this area of medicine. ◆

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TEXT BY

### MAJ (DR) NOREFFENDY BIN ALI

MAJ (Dr) Noreffendy Bin Ali is currently Head of SPC at Army Medical Services Headquarters. He also runs clinic sessions as a resident physician at Changi Sports Medicine Centre.

PROFILE



TEXT BY

### MAJ (DR) MAGDALENE LEE

MAJ (Dr) Magdalene Lee received her aviation medicine training at King's College London, the Royal Air Force Centre of Aviation Medicine and the Republic of Singapore Aeromedical Centre.