



BEYOND THE CALL OF DUTY

The SAF Medical Corps plays a crucial role in maintaining the health of our soldiers and optimising their combat performance. Beyond that, it also renders medical assistance to our neighbouring countries in need and helps to spearhead regional medical initiatives. Six senior commanders of the SAF Medical Corps, each outstanding specialists in their own field, from the Civil Defence Force, Biodefence Centre, Army, Air Force, Navy and Military Medicine Institute (MMI) share how their respective services respond to the call of duty to *seek excellence, save lives and serve the SAF.*

PROFILE



TEXT BY

SLTC (DR) NG YIH YNG

SLTC (Dr) Ng Yih Yng is an SAF emergency physician and holds a Master in Public Health and Business Administration from Johns Hopkins University. He holds the rank of COL as the CMO in the SCDF. He is actively involved in EMS research in Asia and is also the Vice-Chairman of the Asian EMS Council.

SINGAPORE CIVIL DEFENCE FORCE

All SAF medical officers (MOs) have unconventional careers compared to their peers. I have had the unique experience of working in military preventive medicine, although I am an emergency physician by training. I have "toured" Timor Leste as a United Nations peacekeeper for three months, organised the Boxing Day tsunami epidemiological surveillance, managed a chain of over 30 SAF primary care clinics as Deputy Commander of MMI and coordinated with the US Armed Forces to send our SAF medical personnel, including National Servicemen (NSmen) doctors, to run a surgical team in Afghanistan.

In addition to my training in emergency medicine and public health, the military leadership development and training in medical administration I have received in SAF, provided a valuable foundation for my secondment as the Chief Medical Officer (CMO) of the Singapore Civil Defence Force (SCDF) in 2012.

As the CMO of SCDF, I have had the privilege to drive and implement a

coordinated Ministry of Health (MOH)-Ministry of Home Affairs Emergency Medical Services (EMS) masterplan. The last three years have seen the introduction of new equipment and drugs, such as intraosseous needles, professional grade defibrillators that transmit ECG wirelessly by 3G connectivity, tramadol, Pentrox inhalers and faster class III ambulances, in our efforts to upgrade SCDF's capabilities.

The use of systems thinking, acquired from SAF staff processes, has also helped me to holistically review our EMS system, leading to the strengthening of medical leadership structures, improved paramedic education and workforce transformation by cross-deploying firefighters as emergency medical technicians.

Finally, to benchmark our EMS, we've compared our efforts against some of the best EMS systems in Arizona, Milwaukee, Seattle, Tokyo, Taipei and Seoul, leading to transformative initiatives that have doubled bystander cardiopulmonary resuscitation rates from 22% (2012) to 47% (2014) nationally.

BIODEFENCE CENTRE

SAF's contributions to infectious diseases prevention extend beyond Singapore to the wider regional and global scientific community. The SAF has built upon existing scientific research in infectious diseases prevention and control. For example, its seminal study¹ on the efficacy of ring chemoprophylaxis with oseltamivir in the 2009 H1N1 influenza has significantly advanced the understanding of medical protection measures.

The SAF has since developed expertise in biodefence matters and participated in international military and scientific meetings. In addition, SAF staff has also been seconded to the World Health Organization (WHO) – a clear recognition of the quality and expertise of SAF personnel.

Notably, at the height of the H5N1 avian influenza outbreak in 2007, I was given the opportunity to assist the WHO office in Indonesia. Being trained and qualified as a preventive medicine physician and infectious diseases epidemiologist, I was intimately involved in the development of the avian influenza pandemic preparedness and response plan for the country. Subsequently, I was appointed as advisor to the Assistant Director General for Health Security and Environment at the WHO headquarters in Geneva from 2010

to 2012, and have since been actively shaping international health policies.

These opportunities for secondment were also extended to other SAF personnel. During the 2014 MERS-CoV outbreak in the Middle East, Ms Christine Gao, Head Epidemiology Section of SAF Biodefence Centre, was sent to WHO to assist with the response. These secondments serve to enhance the professional exposure and training of our personnel and at the same time, benefit the SAF through the networks established with international biodefence experts.

The fight against emerging infectious diseases (EIDs) is not something that SAF can undertake on its own due to the global nature of EIDs and the global health security concerns.

The SAF builds on its strong biodefence framework by leveraging on both local and international partners. Locally, the SAF collaborates with agencies and institutions such as the Defence Science Organisation, MOH, National Environment Agency, Agri-Veterinary Authority of Singapore, Saw Swee Hock School of Public Health and local hospitals to build the necessary linkages for exchange of information and expertise. Internationally, the SAF has also established collaborations with our regional and international military counterparts to optimise research efforts and to ensure timely exchange of information on EIDs.



PROFILE



TEXT BY

LTC (DR) VERNON LEE

LTC (Dr) Vernon Lee is Head of the SAF Biodefence Centre. He is in charge of preparedness, surveillance and response to infectious diseases in the Singapore military. He is also an associate professor at Saw Swee Hock School of Public Health and the Deputy Director for Communicable Diseases in MOH, spearheading public health policies, disease response, and research activities.

References

1. Lee VJ, Yap J, Cook AR, et al. Oseltamivir ring prophylaxis for containment of 2009 H1N1 influenza outbreaks. *N Engl J Med.* 2010; 362:2166-74.

Legend

1. LTC (Dr) Vernon Lee works closely with his counterparts in the WHO.

PROFILE



TEXT BY

**COL (DR)
POON BENG HOONG**

COL (Dr) Poon Beng Hoong holds the appointments of Chief Army Medical Officer and Commander, SMTI. He is a family physician by training and also holds an MBA with specialisation in healthcare management.

Legend

1. The inaugural joint medical socio-civic mission between the Vietnam People's Army and the SAF to locals at Vinh Phuc province, Hanoi, from 15 to 18 April 2015.

ARMY MEDICAL SERVICES

Through National Service (NS), the Army conscripts the Singapore male population every year to train them as soldiers and to form fighting units. Upon completion of full-time NS, they will continue to serve in their NS units to ensure the operational readiness of the Army. Every cohort comprises males from all walks of life with different aptitudes and capacity for physical activities. They are expected to carry heavy loads and perform strenuous tasks in our tropical climate.

Besides training for battle, the Army is also regularly called upon to organise large-scale complex national events such as the annual National Day Parade. It is also tasked to respond to natural disasters in our neighbouring countries and to provide support and relief to those affected.

The Army Medical Services (AMS) plays an important role in supporting the mission of the Army. To ensure the safety and well-being of our soldiers during training and operations, the medical support in both peacetime and operations needs to be robust and of high exacting standards.

Through the headquarters and subunits, the AMS oversees the training of all the medical

vocationalists and units (including the Combat Support Hospitals), manages medical matters of the ground units, provides injury rehabilitation to maximise soldier performance, and ensures operational readiness to respond to Humanitarian Assistance and Disaster Relief (HADR) operations when called upon.

Through the SAF Medical Training Institute (SMTI), medics, paramedics, nurses and MOs are trained to deliver the best care validated by evidence and international best practices. Effective team training of the medical units and Combat Support Hospitals ensures that, in military operations, they will take on crucial roles to treat combat injuries and perform life-saving surgeries. All our MOs are trained and certified to provide Advance Trauma Life Support, while the surgical teams also undergo more advanced training in trauma management.

The Soldier Performance Centre in the AMS works closely with the local sports medicine fraternity to utilise the latest medical evidence to reduce injuries and to optimise the performance of our soldiers through regular improvements to the Army's training policy and physical equipment.

Over the years, the AMS has participated in numerous socio-civic missions and HADR operations such as the 2004 Indian Ocean tsunami and the 2015 Nepal earthquake. We have constantly maintained a high level of readiness of our personnel and equipment for swift deployment. Lessons learnt from these deployments are incorporated into the development of the Army's surgical capabilities.

In summary, the AMS oversees a wide span of responsibilities. It is through the dedication and professionalism of its people that the AMS has grown from strength to strength over the years.



REPUBLIC OF SINGAPORE AIR FORCE MEDICAL SERVICE

The medical service of the Republic of Singapore Air Force (RSAF) traces its roots back to 1968, when it began as a medical centre providing support to the (previously known as) Singapore Air Defence Command.

Since then, the RSAF Medical Service (AFMS) has undergone rapid changes and reorganisations, each furthering its ability to support the RSAF in its different stages of development and operational needs. AFMS is responsible for three main areas of medical operations, namely medical training, medical research and capability development. The AFMS headquarters oversees the planning and deployment of assets for operational medical support for all RSAF local and overseas activities. This entails developing and executing medical support for local and overseas flying, ground-based air defence deployments and heliborne search-and-rescue missions. In addition, AFMS is responsible for providing aeromedical evacuation (AME) for any injured SAF personnel requiring medical repatriation from overseas. This includes the assessment for fitness-for-flight, the optimal mode of AME platform (military or commercial platforms), configuration of medical equipment and deployment of the AME teams to perform in-flight critical care.

The AFMS has a specialist centre known as the RSAF Aeromedical

Centre (ARMC). Inaugurated in 1982, ARMC has developed into a centre of excellence in aviation medicine after more than 30 years of operations. ARMC is a one-stop specialist centre that provides a comprehensive range of aviation medicine services for all RSAF airmen. ARMC focuses on aircrew health, medical selection, aviation physiology training and human performance programmes through four main specialist domains: (1) Clinical Aviation Medicine; (2) Aviation Psychology; (3) Aviation Physiology and Crew Safety Enhancement; and (4) Performance Maximisation.

In 2009, RSAF commissioned a new suite of training equipment that enabled ARMC to conduct third-generation Aviation Physiology Training (APT) for RSAF airmen. The suite of APT equipment included the human training centrifuge, spatial disorientation trainer, air force night vision integrated laboratory, ejection seat trainer and altitude (hypobaric) chamber (to be upgraded in 2016). ARMC has also implemented the APT e-learning initiative to better educate airmen about physiological threats in air operations.

In 2014, aviation medicine was formally accredited as a medical subspecialty in Singapore. ARMC, with National University Health System as the sponsoring institution, will run a national programme, known as the Aviation Medicine Subspecialty Training Programme, to train aspiring aviation medicine physicians in Singapore.

PROFILE



TEXT BY

COL (DR) GAN WEE HOE

COL (Dr) Gan Wee Hoe is concurrently the Chief Air Force Medical Officer and Assistant Chief Medical Corps (Capability Development and Systems Integration). He holds dual specialist accreditations in occupational medicine and aviation medicine. He sits on the Civil Aviation Medical Board and Chief Medical Informatics Officer Council (Ministry of Health), and is a member of the Subspecialty Specialist Training Committee for aviation medicine.

Legend

1. A group photo of AFMS personnel during the SAF Medical Corps Workplan Seminar.



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PROFILE

TEXT BY

**SLTC (DR)
CHOW WEIEN**

SLTC (Dr) Chow Weien is concurrently the Chief Naval Medical Officer and Commander Force Medical Protection Command. He oversees the SAF Biodefence Centre and Medical Response Force. He is also a SAF cardiologist.

Legend

1. Preparing the Deep Search and Rescue 6 submarine rescue vessel for action.

NAVY MEDICAL SERVICE

From a humble beginning with just two wooden ships, the Republic of Singapore Navy (RSN) has become a modern, versatile and respected modern force today. The office of Senior Medical Officer was formed in 1971 to support the fledgling Navy, and this has since transformed into the current Navy Medical Service (NMS).

Generations of full-time National Servicemen (NSF), NSmen and regular MOs have come through NMS to serve on board the missile gunboats, missile corvettes, patrol vessels, mine counter measure vessels, landing ship tanks, submarines and frigates. It is definitely not a task for the faint-hearted, as our MOs have to work independently in austere environments for prolonged durations out at sea, away from any shore hospital.

It is the strength of our NSmen that has contributed to the successful development of the RSN naval surgical capability. The RSN is one of the few navies in the world where surgeries can be conducted on board a ship. This capability is regularly exercised when we render much needed medical and surgical assistance to remote islands in the region during our socio-civic missions. Of note, foreign navies have commended the RSN for our

accomplishments. This is a very high accolade indeed.

What motivates us in the NMS is our need to support and defend Singapore's every day. To this end, our MOs are required to:

1. Possess professional skills and knowledge to support ships that are deployed for prolonged durations during training and operations. More importantly, they are deployed on board ships to safeguard Singapore waters and to ensure maritime security by protecting our vital sea-lanes of communication.
2. Train "under pressure" in underwater medicine to support divers and submariners at the Naval Diving Unit and on board the submarine rescue vessel, *MV Swift Rescue*.
3. Become "fly docs" as part of the RSN naval aviation capability (naval helicopter).

NMS has been deployed for several significant operations such as HADR mission in Aceh (Boxing Day tsunami), peace support operations in the Northern Arabian Gulf (where we assisted in post-war reconstruction efforts in Iraq), anti-piracy operations in the Gulf of Aden, and search and recovery operation for AirAsia QZ8501 earlier this year.

As we celebrate SG50 and reflect on our past achievements, we also look ahead with confidence that the commitment and dedication of our people will enable us to achieve greater things for the RSN, so that we can continue to defend our waters and protect our every day.

I would like to thank every doctor and medic (past and present) who has helped build NMS into a credible medical force that can support the wide spectrum of RSN operations. We can indeed be proud of what we have achieved.

MILITARY MEDICINE INSTITUTE

The mission of the Military Medicine Institute (MMI) is to sustain and enhance the health of the SAF forces, in peacetime and war, through the provision of primary and specialist healthcare as well as emergency medical care. These are delivered through a network of medical centres, dental centres and specialist clinics run by NSF, NSMen, Defence Executives, as well as civilian medical staff. MMI is also the governing body for healthcare policies, medical classification and health promotion in the SAF.

To safeguard the health of our soldiers, MMI constantly benchmarks itself against standards in the public healthcare institutions and takes alignment with established clinical practice guidelines. MMI employs a medical governance system that taps on the expertise and experience of eminent senior doctors in the public sector, in the form of advisory boards and visiting consultants. This ensures that MMI delivers the best medical care to our soldiers, while keeping up with the changes in the healthcare landscape. Other initiatives, such as the Physician Partnership Programme, where experienced civilian family physicians are deployed in selected medical centres to provide mentorship to NSF MOs, and the SAF Cardiac Fitness Centre, where a partnership with National Heart Centre Singapore

has enabled expeditious access to world-class specialist cardiac investigations and care, have also integrated MMI with the nation's larger healthcare ecosystem.

While primary and specialist healthcare optimises the health and deployability of each soldier, the provision of swift and robust emergency medical care allows for tough and realistic training. In this area, MMI medical centres are always on standby to respond to medical emergencies that may arise during rigorous military training. To maintain the proficiency of medical personnel, medical centres conduct frequent resuscitation drills and refresher training. Modern medical facilities and resuscitation equipment, mirroring those in government hospital emergency departments, further serve to strengthen the trust and confidence of the soldier and the public.

In caring for our soldiers, MMI faces unique challenges, as well as opportunities.

Every soldier is a Singaporean son, brother, husband or father. Given the conscript nature of NS, taking care of the serviceman frequently involves managing his family as well. This is especially the case with NSF, where anxious parents often ask more questions than the patient himself. Nonetheless, it is in MMI's interest to reassure all parents that a robust medical system is in place to take care of their children, for our

servicemen's commitment to the nation's defence stems partly from their family's support.

Every year, more than 20,000 young Singaporean males are enlisted into NS, and they go on to become NSMen who return for In-Camp Training for the next ten or more years. This constantly replenished "captive" audience represents an excellent opportunity for health promotion. By encouraging healthy lifestyles such as eating right, smoking cessation and reduction in obesity, MMI's health promotion efforts play a big role in the health of a large proportion of Singaporeans. Through imbibing practices that can stay with these NSMen for their lifetime, we hope to reduce the eventual burden of chronic diseases on the nation. ♦

PROFILE



TEXT BY

SLTC (DR) LIM HOU-BOON

SLTC (Dr) Lim Hou-Boon holds the appointment of Commander of the MMI. He is an aviation medical officer who joined the SAF in 1995 under the Local Study Award (Medicine) scheme. SLTC (Dr) Lim is also an ophthalmologist who practises at the Singapore National Eye Centre.

Legend

1. Resuscitation and treatment facilities in the new generation medical centres.

