

How We Teach Military Medicine to Medical Cadets at Phramongkutklao College of Medicine

Suthee Panichkul MD*,
Ram Rangsin MD*, Pote Aimpun MD*,
Mathirut Mungthin MD*, Panitan Pradubpongsa MD*,
Danai Heebthamai MD*, Wirote Areekul MD*

* Department of Military and Community Medicine, Phramongkutklao College of Medicine, Bangkok, Thailand

Phramongkutklao College of Medicine has a unique curriculum for “Military Medicine.” Military Medicine involves prevention, threat assessment, evacuations and clinical management of diseases and injuries resulting from military occupational exposures. The Military Medicine curriculum covers all the entities of knowledge of Military Sciences, Combat Medical Skills, Military Preventive Medicine, Military Applied Physiology and Military Contingency Medicine. The highlight of the curriculum is “Operation Petcharavut” that represents simulated battlefield operations, involving multidisciplinary clinical integration and military regulation. In this course, medical cadets review all the knowledge that they have learnt and in addition, Medical Platoon leader strategies, Advanced Cardiac Life support and Phramongkutklao Traumatic Life support, crucial medical practices. Medical cadets would experience simulated patients with minimal injuries to critical wounds and complications including combat stress syndromes in various situations, from advancing to retreating units and from Battalion Aid Station to Division Medical Operations Center, whether during day or night.

Since the medical cadets experience all Military Medicine courses from the second to the sixth year class and pass all medical knowledge-based examinations, Phramongkutklao College of Medicine expects all graduates to be excellent in not only all standard requirements of the medical professional set forth by the Medical Council of Thailand but also ready to serve the nation effectively in the Royal Thai Armed Forces.

Keywords: *Advanced cardiac life support, Military medicine, Military contingency medicine, Phramongkutklao traumatic life support, Integration*

J Med Assoc Thai 2009; 92 (Suppl 1): S140-4

Full text. e-Journal: <http://www.mat.or.th/journal>

Phramongkutklao College of Medicine is the only institute in Thailand that creates military doctors accordance with His Majesty King Bhumipol's initiative^(1,2). The graduates from Phramongkutklao College of Medicine must be able to serve in the Royal Thai Armed Forces during both peace and wartime with insight, morals and the professional attitudes of a military doctor. Department of Military and Community Medicine is one of 18 departments, achieving this purpose⁽³⁾. Phramongkutklao College of Medicine has

a unique curriculum that no other medical schools have, namely, “Military Medicine”.

Military Medicine involves prevention, threat assessment, evacuations and clinical management of diseases and injuries resulting from military occupational exposures⁽⁴⁾. During wartime, military physicians not only have to encounter environmental hazards under combat operations but also evacuation sequences and medical logistic supplies have to be properly managed. Other than that, military physicians have to prevent all other diseases, including disease and non-battle injury (DNBI), the most common cause of illness, and to promote the health of the Royal Thai Armed Force personnel at the maximum strength to be ready for operations. In peacetime, military physicians

Correspondence to: Panichkul S. Department of Military and Community Medicine, Phramongkutklao College of Medicine, 315 Rajwithi Road, Rajthewi, Bangkok 10400 Thailand. Phone: 0-2354-7600 ext 93681. E-mail: sthpanich@hotmail.com

have to experience other major tasks of prevention and treatment of diseases in both personnel and their families.

Course Design and Course Structure

In order to meet the multiple demands placed on military physicians, the curriculum of Phramongkutklao College of Medicine has to cover all the entities of knowledge of Military Medicine, consisting of Combat Medical Skills, Military Preventive Medicine, Military Applied Physiology and Military Contingency Medicine (Operation Petcharavut).

The curriculum of Military Medicine starts in the first semester of the second-year and expands the vast body of knowledge until the last semester of the sixth-year, which is composed of many subjects such as Military Science I, Military Science II, Military Science III, and Military Science IV.

Military Science I is a two-week noncredit course in both theory and practice taken during the second year of medical cadets training. These will introduce them to and provide their first exposure to military life. The medical cadets will be in combat training with and without weapons. They will learn how to use a map and compass during day and night, and how to communicate with other units by field radio. They will study military strategies, security and regulations. As a part of Military Medicine, medical cadets will learn how to administer first aid in the field,

and how to use stretchers effectively, which is the only transportation for patients on the combat front line. These processes will be taught by experienced veterans of the infantry and medical corps of the Royal Thai Army at Chulachomklao Royal Military Academy, Nakorn Nayok Province. There is an elective course for this second year. The airborne operation course is an elective noncredit five-week course. The airborne operation school, special warfare centre is responsible for the training (Table 1).

Military Science II is a two-week noncredit course for the third year students. The military instructors train the students outside the home stations about shooting, gun adjusting, shooting at night, using a map and compass during day or night, patrolling, escaping, testing mental strength by cliff climbing, rappelling from a 34-foot tower, handling explosives, besieging and inspecting. Moreover, the main content of this year are Combat Medical Skills, starting from patient approach, casualty sorting, bandaging, stop bleeding, splinting and immobilization, patient transportation and basic cardio-pulmonary resuscitation (CPR), which is a Medic's duty. Then an one full week of field training will be held to expose the students to a real combat and field operation consisting of eight stations: day and night mobilization, day and night Medic first aid, Nuclear Biological and Chemical warfare first aid, evacuation and referral system, battalion aid station and division medical operation center. These

Table 1. Course of Military Medicine in pre-clinic

Course	Credits	Year	Weeks	Details of course
Military Science I	-	2	2	<ul style="list-style-type: none"> - Combat with & without weapons - Use map and compass during day and night - Communicate with other units by field radios - Military strategies, security and regulations - First aid in the battlefield - Transportation for patients on the combat front line - The airborne operation course (Elective course)
Military Science II	-	3	2	<ul style="list-style-type: none"> - Combat with & without weapons - Use map and compass during day and night - Patrolling, escaping, testing mental strength by cliff climbing, rappelling from a 34-foot-tall tower, handling explosives, besieging and inspecting - Patient approach, casualty sorting, bandaging, stop bleeding, splinting and immobilization, patient transportation and basic CPR - Day and night mobilization, day and night Medic first aid, Nuclear Biological and Chemical warfare - First aid, evacuation and referral system, battalion aid station and division medical operation center

processes will be taught by experienced veterans of the infantry and medical corps of the Royal Thai Army at Chulachomklao Royal Military Academy, Nakorn Nayok Province (Table 1).

Military Medicine III is a three-week course of two credits for the fifth year students. The course emphasizes theories of Military Preventive Medicine and Military Applied Physiology, the latter dealing with environmental hazards which alter the physiology of soldiers in the field including immersion injuries, barotrauma and altitude illness, nuclear, biological and chemical injuries, lightning and electrical injuries, heat and cold injuries, bites and stings, eye injuries and conserving vision, noise and impairment of hearing and vestibular dysfunction, circadian rhythm and dysrhythmia, military dermatology, blast injuries, missile-caused wounds, multiple injuries and sport injuries. Military Preventive Medicine is a course about field sanitation of both fixed and mobilized units including field water supplies, toilets and vector control, prevention and control of diarrheal diseases, infectious diseases commonly found on the front line: malaria, scrub typhus, trench fever, etc, and personal hygiene in the field. These processes will be taught by instructors from Phramongkutklao College of Medicine, Phramongkutklao Hospital, and the Preventive Medicine Division of the Royal Thai Army Medical Department (Table 2).

Military Medicine IV (Operation Petcharavut) is a three-week course of two credits for the sixth

year medical students. This course that will prepare medical cadets for their future lives as military doctors. In fact, the course has just been developed during the last four years based on original curriculum of the Military and Emergency Medicine Department of the Uniformed Services University of the Health Sciences (USUHS), Bethesda, Maryland, United States of America⁽⁴⁾. Phramongkutklao College of Medicine sent faculty members from various departments to observe and attend this course at the USUHS and the course was established at Phramongkutklao College of Medicine, modified according to their highly valuable recommendations.

During the first two weeks of this session, medical cadets will review all the basic knowledge that they have learnt in addition to Medical Platoon leader strategies, Advance Cardiac Life support and Phramongkutklao Traumatic Life support, crucial medical practices. This is the highlight of the curriculum. Operation Petcharavut integrates all the knowledge from Military Science I to Military Medicine III or in other words, from service in a litter squad to treatment as a battalion surgeon or physician at the Division Medical Operations Center. Medical cadets will experience simulated patients with minimal injuries to critical wounds and complications including combat stress syndromes in various situations, from advancing to retreating units and from Battalion Aid Station to Division Medical Operations Center, whether day or night. They will apply not only their

Table 2. Course of Military Medicine in clinic

Course	Credits	Year	Weeks	Details of course
Military Science III	2	5	3	<ul style="list-style-type: none"> - Dealing with environmental hazards altering the physiology of soldiers in the field - Immersion injuries, barotrauma and altitude illness, nuclear, biological and chemical injuries, lightning and electrical injuries, heat and cold injuries, bites and stings, eye injuries and conserving vision, noise and impairment of hearing and vestibular dysfunction, circadian rhythm and dysrhythmia, military dermatology, blast injuries, missile-caused wounds, multiple injuries and sport injuries - Field sanitation of both fixed and mobilized units including field water supplies, toilets and vector control, prevention and control of diarrheal diseases - Infectious diseases commonly found on the front line: malaria, scrub typhus, trench fever, etc., and personal hygiene in the field
Military Science IV	2	6	3	<ul style="list-style-type: none"> - Medical Platoon leader strategies - Advance Cardiac Life support and Phramongkutklao Traumatic Life support - Integrates all the knowledge from Military Science I to III

knowledge but also their intellect to solve the strategic problems, treat all the casualties and evacuate those patients back to the Division Medical Operations Center with the ultimate course objective of being to save everyone's life. The medical cadets will be evaluated by experienced physicians from all departments of Phramongkutklao Hospital for medical practice and by experienced faculty members on the combat frontline for leadership. These processes will be taught by instructors from Phramongkutklao College of Medicine, Phramong-kutklao Hospital, and the Preventive Medicine Division of the Royal Thai Army Medical Department, Medical Field Service School and alumni of Phramongkutklao College of Medicine (Table 2).

Outcome Measurement

For Military Medicine III, the medical cadets will be evaluated by using the multiple choice question (MCQ) tests. For Military Medicine IV (Operation Petcharavut) they will be evaluated by the experienced physicians from all departments of Phramongkutklao Hospital for medical practice. They have to pass the MCQ test as well as the objective structure clinical examination (OSCE) test from various scenarios. Furthermore, they will be evaluated by experienced faculty members on the combat frontline from the Medical Field Service School and the Royal Thai Army Medical Department instructors regarding leadership skills. All medical cadets are required to complete an evaluation and pass examination of both theory and practice. The minimum average time of attending class score of the medical cadets is 80%, failure to participate is grounds for course failure. Other feedback processes are provided to each group after completion of the individual scenarios.

Discussion

We describe military medicine courses for medical cadets of Phramongkutklao College of Medicine. The goal of the course is to prepare young physicians

to work in austere medical settings with the equipment currently available as military physicians^(5,6). Since the medical cadets experience all Military Medicine courses from the second to the sixth year and pass all medical knowledge-based examinations, Phramongkutklao College of Medicine expects all graduates to be excellent in not only all standard requirements of the medical professional set forth by the Medical Council of Thailand but also ready to serve the nation in the Royal Thai Armed Forces unconditionally as exemplified by our motto, "To be excellent in medical education, to be good doctors and gifted soldiers, for our beloved Motherland".

Conclusion

After completing all course requirements the medical cadets will gain critical knowledge, refine valuable skills and acquire professional attitudes. These necessary components are integrated in a traditional medical school curriculum for a career in military medicine. They will obtain and have the ability to provide effective medical treatment in a challenging environment.

References

1. History of Phramongkutklao College of Medicine. 25th year Anniversary of Phramongkutklao College of Medicine. 16 June 2000: 6-7. (in Thai)
2. Speech of His Majesty the King Bhumipol to Mahidol University. 29 August 1973.
3. Handbook of 6th year Medical Cadet in Military Medicine Department of Military and Community Medicine, Phramongkutklao College of Medicine.
4. Military-unique curricula. Bethesda, MD: Uniformed Services University of the Health Sciences; 1989.
5. Langenbach M. Curriculum models in adult education. Malabar, FL: Krieger Publishing Company; 1993: 193-208.
6. Army medical department regulation part of ordering competence of army medical students of Phramongkutklao College of Medicine, 1991.

เราสอนวิชาเวชศาสตร์ทหารให้กับนักเรียนแพทย์ทหาร วิทยาลัยแพทยศาสตร์พระมงกุฎเกล้า
อย่างไร

สุทธิ พานิชกุล, ราม รั้งสินธุ์, พจน ेमพันธ์, มติรุทธ มุ่งถิ่น, ปณิธาน ประดับพงษา, ดนัย หีบท่าไม้, วิโรจน์ อารีย์กุล

วิทยาลัยแพทยศาสตร์พระมงกุฎเกล้าเป็นโรงเรียนแพทย์แห่งเดียวในประเทศไทย ที่จัดการเรียนการสอน
เนื้อหาวิชา เวชศาสตร์ทหาร (Military Medicine) อยู่ในหลักสูตรด้วยโดยมีเนื้อหาวิชาวิทยาศาสตร์การทหาร,
ความรู้พื้นฐานทางการแพทย์ทหาร, เวชกรรมป้องกันทหาร, สรีรประยุกต์ทางทหาร, และเวชปฏิบัติการยุทธ
โดยเฉพาะในส่วนของภารกิจภาคสนามหรือ “ปฏิบัติการเพชรอาวุธ” ซึ่งเป็นการผสมผสานวิชาทางการแพทย์
และวิชาทางทหารเข้าด้วยกันแบบบูรณาการ โดยนักเรียนแพทย์ทหารจะต้องทบทวนความรู้เดิมที่ได้รับการเรียน
การสอนมาไม่ว่าจะเป็นเนื้อหาในเรื่อง การช่วยชีวิตผู้ป่วยอุบัติเหตุ, การช่วยผู้ป่วยเจ็บจำนวนมาก, และการช่วยชีวิต
ชั้นสูง รวมถึงลักษณะการเป็นผู้นำหน่วยทหารทางการแพทย์ นักเรียนแพทย์ทหารจะได้รับประสบการณ์ในการฝึก
กับผู้ป่วยสมมติ ซึ่งมีลักษณะการบาดเจ็บที่แตกต่างกันตั้งแต่บาดเจ็บไปจนถึงบาดเจ็บรุนแรงและการฝึกกับผู้ป่วยที่มีภาวะ
เครียดในสนามรบในรูปแบบต่าง ๆ ไม่ว่าจะเป็นในสถานการณ์ใด ๆ เช่นการส่งกลับผู้ป่วยจากที่พยาบาลกองพันไปยัง
ที่พยาบาลกองพลทั้งกลางวันและกลางคืน จากประสบการณ์การเรียนการสอนที่นักเรียนแพทย์ทหารได้รับจาก
วิชาเวชศาสตร์ทหารตั้งแต่ชั้นปีที่ 2 จนถึงชั้นปีที่ 6 ตลอดจนการได้รับการฝึกปฏิบัติจริงในการฝึกภาคสนาม
“ปฏิบัติการเพชรอาวุธ” มีส่วนสำคัญเป็นอย่างมากในการเสริมสร้างให้นักเรียนแพทย์ทหารวิทยาลัยแพทยศาสตร์
พระมงกุฎเกล้า มีความพร้อมที่จะจบเป็นแพทย์ทหารที่สามารถปฏิบัติหน้าที่ด้านการแพทย์ทั่วไป และสามารถที่จะเป็น
ผู้นำหน่วยสายแพทย์ที่ดีให้กับหน่วยต่าง ๆ ของกองทัพไทยได้
