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Field Medical System and Battlefield Emergency Care in Finland –the Present and Future

The aim of this presentation is to present the battlefield medical care changes in the Finnish Defense Forces (FDF). First I will describe common battlefield injuries in the field. Then I will outline practice of battlefield medical care. After that the FDF field medical system will be shown and at the end the future challenges are introduced. This case study is based in an article in 2014 (1).

Finland

Finland is a Nordic country in Northern European nation bordering Sweden, Norway and Russia with a population of 5.5 million. Helsinki is the capital city of Finland. Finland is a parliamentary republic with a central government based in Helsinki. Finland has one of the world's most extensive welfare systems, one that guarantees decent living conditions for all residents, Finns, and non-citizens. Finland is a top performer in numerous metrics of national performance, including education, economic competitiveness, civil liberties, quality of life, and human development. Finland ranked first in the world Human Capital Index in 2016 (2).

Why Conscription in Finland?

Finnish Defense Forces is conscript based army. General conscription guarantees Finland's military security. All Finnish men between the ages of 18 and 60 are liable for military service. Women can apply for voluntary military service. All men must either do military service or non-military service. As Finland is not a member of any military alliance, it is prepared to defend its territory relying on its own resources. General conscription generates enough resources for the Army, Navy and Air Force to act effectively in times of war and crises. Conscription is a cost-effective way of generating a large and capable reserve. Our reservists possess skills acquired through military service and life in general that can be used to defend the country. Every man must attend a call-up the year he turns 18. Where and when a conscript will serve is determined during the call-up. If a conscript is not fit for service, he is exempt from peacetime military service. A conscript may serve later if he has a good reason to postpone his service. Military service lasts 165, 255 or 347 days. Non-military service lasts 347 days. After conscripts have completed their military service, they go into the reserve. Reservists can be ordered to attend refresher trainings and, when required, to defend Finland with arms (3).

Recent Report of Battlefield Care

Recent reports from casualties in Iraq and Afghanistan suggest that upwards of 95% of battlefield injuries have survived when prompt care and triage are implemented promptly, utilizing air transport to advanced level treatment facilities within the golden hour following initial trauma: triage, antibiotic use, blood banking techniques, use of wound adhesives and hemostatic bandages, tourniquet use, and Hemostatic resuscitation. The concept of triage, or prioritization of wounded in an attempt to maximize survivors, was first introduced by the French in World War. After implementation of these techniques in the Korean and Vietnam conflicts, triage became standard practice world-wide in civilian trauma care. Other major advancements commonly attributed to wartime experiences include: antibiotic use blood banking techniques, use of wound adhesives and hemostatic bandages, tourniquet use, and hemostatic resuscitation (4).

International Crises Management (ICM) of FDF

The International experience gained in the Finnish Defence Forces Crisis Management tasks cannot be directly made use of in field medicine. The high rate of use of protective equipment used in crisis management affects injury profiles, where there are a higher number of lower extremity injuries, since injury profiles are different. Indirect fire and airborne fire is widely used in the Finnish battlefield, as a result of which the proportion of upper body injuries increases. The use of a tourniquet is in fact almost exclusively used for the treatment of life-threatening hemorrhages (amputations and crushings) If the operational situation is critical, and if a wound and its bleeding cannot be staunched, a tourniquet can be set to treat a

bleeding limb that is potentially life-threatening. The use of a tourniquet successfully requires that its necessity is properly assessed. The FDF does not currently have this ability. There is currently a shortage of medical personnel and medical NCOs, which means that expectations are too high in comparison to the current knowledge and resources. In the lead NATO crisis management personal security has improved survival but increased the number of serious limb injuries (1).

Combats Against Hypothermia

Field medicine combats against hypothermia. Low body temperature is defined as a state where the internal temperature of the body, core temperature, is less than 35C. This state already leads itself, if left untreated, to the loss of lives and is an important, if not crucial additional factor of war trauma. Hypothermia is a physiological warning sign, which adds to overall mortality. Prevention of hypothermia could reduce the utilization of field medicine resources and thus improve the patient's survival on the battlefield (1).

TCCC

The central principle of the FDF's medical care is to take advantage of reservists' civilian training. They are further trained to work in battlefield conditions, using the FDF equipment. Battlefield first-aid training does not correspond the international Tactical Combat Casualty Care TC3 or TCCC operations and it should not be equated to these operations when assessing its performance. However, combatants', fighter pairs' and squads' combat first-aid training is given according to TC3's tactical principles. Combatants are allocated a personal emergency kit for the implementation of the care they provide. Battle Rescuers' treatment equipment is additionally used in the future by at least all the troops performing light infantry duties, but also by other troops (1).

Practicing Battlefield Medical Care in FDF

Among other things, coniotomy as emergency airway opening is an operation performed by professionally trained medical personnel and Special Forces, and identifying and triggering of pressure pneumothorax is part of a battle medic's training program. It is of course self-evident that the forces have available to them, for the purpose of stopping life-threatening hemorrhage, for example new models of tightening ties and external, bleeding clotting hemostatic bandages (1).

Modularity and compatibility make flexible tactical use of medical force possible for all of the Services. This facilitates development, training, maintenance and interchangeability. High performance medical modules can be pro portioned out to troops formed according to task and need, such as battle squads and groups. Places of medical care are referred to as clinics or treatment stations, depending on the type of medical equipment available to them. Clinics or treatment stations have either M05 or MOD80 compliant equipment. Model 2005 (M05) compliant equipment is either emergency clinic or emergency treatment station medical equipment. Operational forces are equipped with the latest medical equipment. Some other forces are equipped with reformed medical material. Field medication has shifted from static activities to more a dynamic modus operandi as well as diverse cooperation. Medical treatment equipment is transferred flexibly from place to place in accordance with the requirements of emergency care (1).

The same emergency measures cannot be carried out in the field as in civilian emergency care. For example, trauma patients can often not be intubated if a follow-up cannot be ensured. Medical measures should be performed during evacuation. The number of paramedic measures is more limited than in civil emergency care. Emergency care medications should be administered to the mucosa more than intravenously, as in the example of a "fentanyl lollipop" that the patient can suck on. In addition, medications can be administered in the field by intramuscular injection and in to the bone, so the patient does not always have to be given drugs intravenously (1).

Evacuation

The early stage of patient evacuation is still a challenge to field medicine. Evacuation in its early stage is always coordinated by the military leader, or as part of other activities of a fighting force. If necessary, the military leader appoints a suitable combat vehicle to support the evacuation. A well-formed medical intervention plan, as part of a battle plan, forms the basics of the evacuation (1).

MEDEVAC

Under special circumstances Army transport helicopters (NH-90), Air Force transport aircraft (C295M) and naval vessels can be used for the rapid transfers of medical teams, medical equipment, and patients. For medical rescue tasks, where necessary, they are equipped with medical equipment that has been designed in collaboration with civilian experts of emergency care. Battle area field medicine is strong in Finnish troops. The newly renovated field medical system also includes surgical performance and meets international requirements (1).

Future Challenges

In THE past years FDF has greatly invested in medical simulation. You can find high fidelity simulators in every garrison, and FDF's a special advisory unit in the Centre of Military Medicine is able to borrow one for those who will need one in their practices. Because of the lack of time in medical personnel's training it is important that their training is as effective as possible. By using high fidelity simulators, transportable blood packs etc., medical personnel can train many different procedures that they cannot train without these simulators. In the future the focus of advanced training will be on prolonged field care. Young conscripts usually are not comfortable nursing patients, taking care of patients' intimate hygiene, nutrition and other mundane-maneuvers. With the simulators you can also train basic care.

My Motto is "If It will not work on a bright, summer day, and under normal circumstances...
So how can we think, it would work in the dark, in winter or in emergency conditions
So, Educate and Train".

References

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4. Kashuk, JL., Peleg, K., Glassberg, E., Givon, A. and Kluger, Y. Potential benefits of an integrated military/civilian trauma system: experiences from two major regional conflicts. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* (2017):25:17, 2-6. DOI 10.1186/s13049-017-0360-6.