Medical Support to Light Footprint Operations

Why smaller operations require a different approach to medical support

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RAND EUROPE

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Project objectives and methodology

RAND Europe was commissioned by the European Defence Agency in October 2015 to conduct a study on Light Footprint Operations (LFO). The overarching goal was to provide the European Defence Agency (EDA) with the analytical means to identify new ways of providing effective medical support to LFOs in the context of Common Security and Defence Policy (CSDP). The study forms part of the EDA's wider support for developing European defence capabilities, promoting Defence Research and Technology and armaments cooperation and promoting its role as a key facilitator for the development of the capabilities necessary for the CSDP.

LFO is a concept not currently found in EU doctrine, despite a number of recent EU missions being characterised as: involving a limited number of personnel deployed with no host nation support; seeking to leave less of an infrastructure footprint; and estimated to be less in duration than more traditional military operations. The smaller operational footprint has implications for the type and scale of medical support provided. While LFO missions have the size of a battalion or less, so far all EU missions that have not had support from the country of deployment, have deployed medical support for more traditionally defined medical capabilities (Role 1 and Role 2 medical treatment facilities (MTFs). These capabilities are designed to support larger military formations in both permissive and hostile operating environments. Due to this apparent mismatch between the medical population at risk in small operations, and the current medical support options available, the EDA determined that there might be a space for alternative approaches to medical support. As LFOs do not formally exist in current EU or NATO doctrines, there is no finalised description of medical support to these operations.

RAND Europe's study thus analysed key elements of LFOs and identified required doctrinal changes, resources and skillsets necessary to reach appropriate level of medical support for LFOs.

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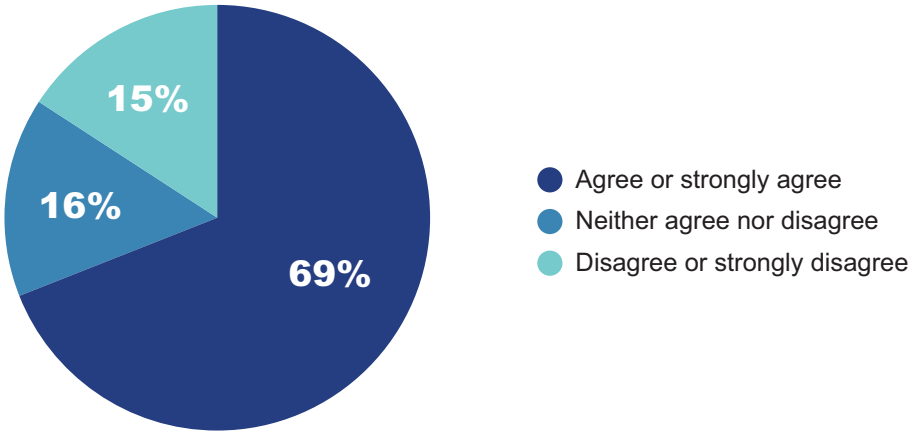
Figure 1. Survey responses to 'Smaller operations require a unique type of medical support provision'



To investigate these areas, RAND Europe deployed a selection of methodologies that included concept development, case study analysis, literature reviews, stakeholder and expert interviews, an expert workshop with the participation of the EDA medical personnel, surveys, the development of scenarios and feasibility assessments.

Table 1. Overview of methodologies deployed[1]

	Document analysis	Case-study analysis	Stakeholder interviews	Literature review	Stakeholder workshop	Internal analysis	Survey
WP1: Light Footprint Operations	✓	✓	✓		✓	✓	
WP2: Capability Analysis	✓		✓		✓	✓	✓
WP3: Options development and feasibility assessment	✓			✓		✓	(✓)
WP4: Harmonisation and standardisation			✓	✓		✓	(✓)
WP5: Development of recommendations						✓	

[1] A tick ✓ indicates that a particular methodology was applied directly for that phase of the project. A tick in brackets (✓) indicate that previously conducted data informed a particular phase.

Main findings

Overall, the study findings highlight a number of issues and challenges associated with the provision of medical support to LFOs in a European CSPD context.

A definition of Light Footprint Operations is proposed

Given that there is no doctrinal definition of an LFO in EU or NATO doctrines, the study team developed a new definition from a combination of a literature review and expert interviews. The definition was developed to be consistent with existing EU policies and doctrines and considered LFOs as both a concept of operations and practical approach to operations. It also considered factors identified by the research and scope requirements set by the EDA that capture the unique challenges for LFOs. The proposed definition is as follows:

> A mission that has a limited number of personnel, operating in a permissive or semi-permissive environment, without host nation support (HNS), operating autonomously, with a scarcity of basic infrastructure, over extended lines of communication and less than 12 months in duration.

Current medical support practices to operations are varied

In order to identify current practices of medical support provision, the project investigated three case studies: EUTM Mali, EUTM Somalia and UN MINUSCA. All these missions were assessed due to having characteristics that corresponded with the definition of LFOs. These case studies showed that while there are robust standard operating procedures, agreements and doctrinal requirements of medical capabilities in place, each national medical treatment facility or element works to its own national clinical standard. At the same time, these standards could be open to interpretation with a common clinical governance framework being required to better enable multinational cooperation. Medical personnel categories were not always the same across missions, and different responsibilities and role definitions were associated with particular roles. For example, the medics were seen as having a critical role in the provision of immediate and intervention care within the 10–1–2 timeline[2], but there exists no commonly agreed definition from the EU or NATO and no common standard of training and certification. In addition, while surgical capability is vital for certain injuries, the study showed that the more common use of the deployed surgical capability was to conduct an appendectomy or minor surgery to treat cysts and abscesses. Finally, the most common medical issues for missions include gastroenteritis, respiratory illness, muscular skeletal (including sports injuries and road traffic accidents), dermatological and environment-specific illnesses, rather than issues related to military operations.

European medical support capabilities differ depending on country priorities

Different medical support capabilities exist in Europe today. However, there is currently no capability overview available that demonstrates

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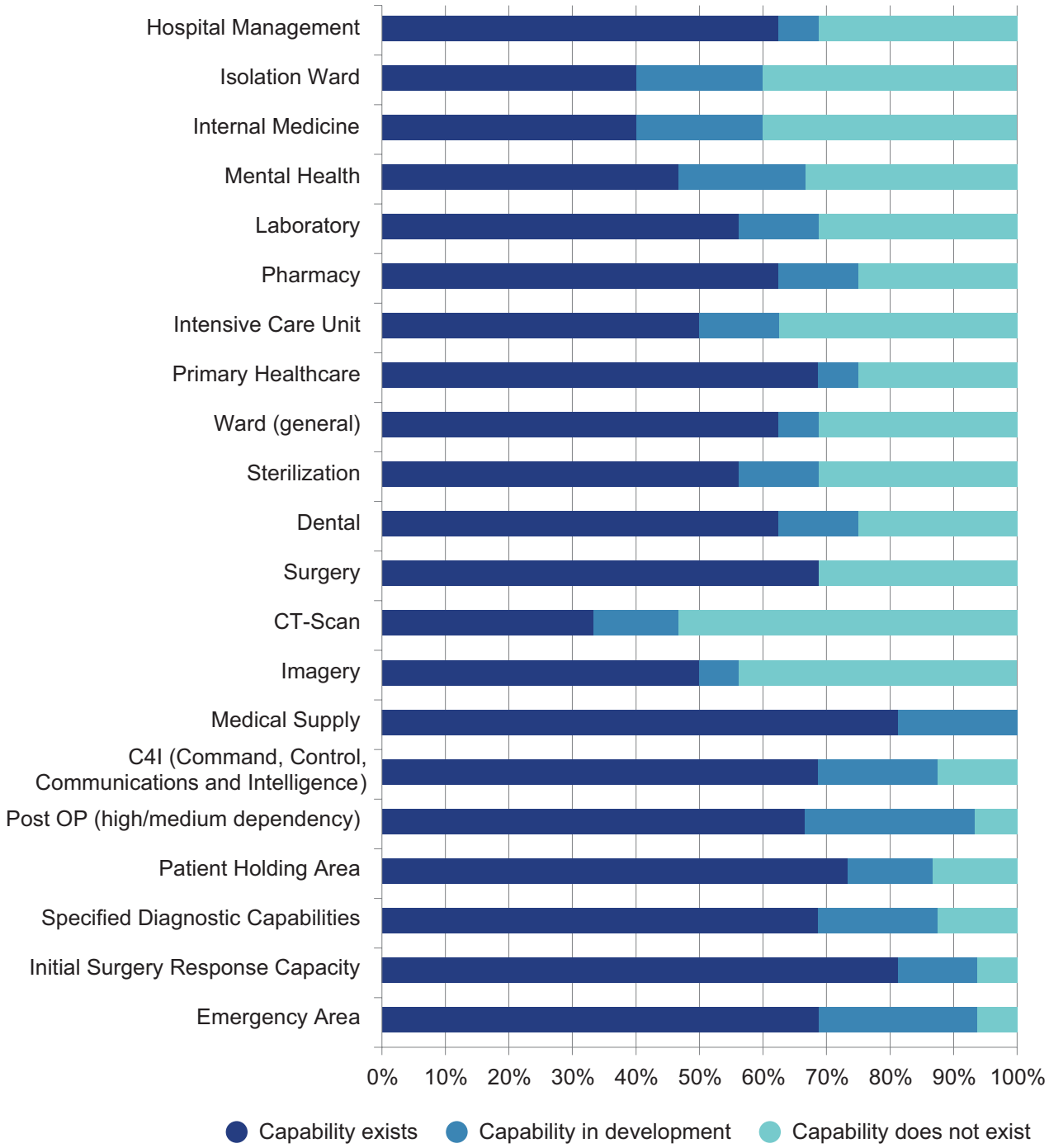
[2] The 10–1–2 timeline is a guideline to ensure that appropriate life, limb and functions saving treatment are provided within specific clinical timelines. It consists of **Enhanced first aid**, that is, immediate life-saving measures applied by personnel trained in tactical combat casualty care. Bleeding and airway control for the most severely injured casualties is to be achieved within **10 minutes** of wounding. **Damage control resuscitation**, that is, measures commenced by emergency medical personnel within **1 hour** of wounding; and **Damage control surgery**, that is, depending on the specific and individual requirement the aim is to be able to provide damage control surgery (DCS) within **1 hour**, but **no later than 2 hours** of wounding. SOURCE: UK MOD (2015) Allied Joint Doctrine for Medical Support. Edition B Version 1 with UK National elements.

Figure 2. Current EDA pMS Role 1 - Role 2 medical capabilities



the individual capabilities at a country or European level. Perhaps unsurprisingly, findings from the survey distributed to participating Member States (pMS) survey found that countries were more likely to have developed national medical capabilities (e.g. Role 1). The more complex or advanced the medical capabilities were, the more likely it was that there were gaps at a European level. While not necessarily linked, the survey respondents also expressed challenges with the skills retention and recruitment of medical personnel to the military life. It may be assumed that the variation of medical capabilities is likely in line with the individual nations' socio-economic development, the development of their Armed Forces and history and lengths of previous deployments.

Furthermore, the project team identified the main challenges in the provision of medical support to military operations faced by the respondents to the survey. Ten respondent countries indicated that the main challenge is the limited medical support capability available, allowing for the assumption that countries are facing pressures to prioritise missions and resources. More than half of the respondents considered high costs as the main challenge in the deployment of medical capabilities to CSDP missions. Half of the survey respondents indicated that the differences in training and experiences among the medical personnel are a significant issue for the EDA pMS at the moment.

EDA pMS are interested in standardisation and harmonisation among the EDA militaries and with civilian sector, but this needs to be acceptable to the practitioners on the ground

The study identified different cultures and expectations with regards to medical support provisions, variations in medical equipment and the harmonisation of medical equipment. Overall, the development of common standards was seen by the EDA pMS as a positive and mutual trust-building concept, allowing countries to have increased confidence in the medical support provided by other countries.

However, while the standardisation and harmonisation of requirements provide opportunities and the basis for joint research and development and procurement, it may also cause some challenges. The study found that there is an appetite for solutions to encourage interoperability and standardisation, not just with other countries, but with the civilian sector too. At the same time, it was recognised that standardisation solutions need to adhere to the national laws of the member states and international laws and regulations.

Standardisation may encounter resistance from medical personnel, as it could be perceived as a means of control and imposing limits on what is perceived as the autonomous nature of the profession. It is therefore necessary to use standardisation that is based upon clear rationale and acceptable to the medical practitioners in the field. Standardisation of technology should not affect the quality of the care that can be provided by the medical personnel and the effectiveness and efficiency of the procedures.

New technologies can improve the resilience of soldiers and enhance medical support for LFOs, but further development and monitoring is required to ensure that they are fit-for-purpose during military operations

Technology may assist in cases where the deployed medical personnel is missing, injured or killed, or as a means of providing capabilities that are not available on the ground through the application of, for example, telemedicine options, diagnostics and decision support, robotics and Artificial Intelligence (AI). Experts have identified a number of issues where technologies could be particularly important

for military operations, which include: securing airways; haemostasis and blood transfusion issues; and point of care diagnostics. The importance of technology in improving medical training and the use of genomics and gene editing to improve the soldier resilience were also noted among future applications.

Regarding the introduction and application of new technologies into military field medicine, the study identified a number of challenges related to the use of and over-reliance on new technologies in an operational environment. These are:

- a false sense of security and capacity due to the presence of advanced technologies
- ethical and legal implications related to consent, level of care, sharing of personal information, capability, prolonged field care and evacuation;
- an overreliance on enabling factors, such as communication lines
- technologies only being applicable to technologically savvy users
- medical technologies not being applicable to the tactical requirements of a mission, such as the footprint; and
- uncertain risks related to the use of autonomous and semi-autonomous robots.

Although it is recognised that there are opportunities for greater cooperation between military and civilian medicine for either provision of medical support or specific technological developments, a number of concerns were raised.

- Concerns about sharing personal patient information with civilian and private companies.
- Concerns that there are fundamental differences in the way technologies are used in military and civilian sectors.
- Concerns that the civilian sector would not develop technologies that address specific military needs and address the standards of application.

Medical support feasibility assessment

In order to develop recommendations, the project team carried out a feasibility assessment for medical support for four different LFO scenarios developed for the purpose of this study. For each of the scenarios ranging from military training and advice in a subtropical climate to peacekeeping in a tropical climate, options for the provision of medical support were developed and assessed against the following client-agreed criteria: degree of multination cooperation, timelines, size of deployed footprint, meeting operational requirements, and dependency on medevac. Based on the calculated wounded in action (WIA) and disease and non-battle injuries (DNBI) rates in permissive and semi-permissive environments, the study developed options for the lowest possible capacity that can be generated for medical capabilities for LFOs.

The assessment found that current operational guidelines dictate that care up to Role 2 is likely required in-theatre for LFOs. However, experience has shown that EU countries are willing to accept some risk of not meeting operational guidelines when risk is low and populations are small. When the EU makes the determination to take on this risk, mission medical planners will put measures in place to provide care as quickly as can be managed without incurring the burden of deploying a facility in-theatre. In some cases, it could be a valuable option to deploy an ATLS-trained physician rather than an entire Level II facility.

There are several capabilities that are a necessary part of deployed medical support. Generally agreed to be fundamental to Role 1 care are: Primary care and Preventative Medicine; First Aid; Casualty Handling, Triage

and Evacuation. Fundamental to Role 2 care are: Surgery Including DCR/DCS and Routine Surgery, and Post-surgery Care; and, Patient Holding.

Requiring Role 2 care to be provided for all LFOs may be the best policy. However, explicitly discussing how EU missions might accept risk in cases where resources for Role 2 care is not available, enables medical planners to make better decisions when required. At Role 1 facilities, providers are not currently uniformly trained, or required to be trained, to perform advanced lifesaving procedures. In emergencies, they are responsible for casualty care, triage, and evacuation. If member states are going to assume risk in some cases, it may be desirable to reduce risk through additional training for deploying providers, without incurring the high resource burden of deploying a Role 2 facility. Providing advanced trauma life support procedures/advanced cardiac life support (ATLS/ACLS) capability in-theatre provides better medical support to deployed forces than an alternative of no care available beyond typical Role 1 capabilities.

Table 2. Feasibility criteria

Primary	Secondary	Tertiary
Degree of multinational cooperation	Cost	Political will
Timelines	Available capability	Deployment flexibility
Size of deployed footprint	Dependency on new technologies	Threshold for fitness
Meeting operational requirements	Degree of upskilling required	Delivering contribution to wider security and stabilisation
Dependency on MEDEVAC	Level of risk taken by the operational commander	

Main recommendations

The study identified six main recommendations, each of which has implications for policymakers in the area of provision of medical support to LFOs.

Introduce changes to current EU doctrine

The study showed broad support for a unique approach to medical support during smaller operations, which would include specific medical support provisions. However, as the current EU Medical Doctrine does not recognise operations of different scales or a definition for LFO, the main recommendation is to address this doctrinal gap. The results of the study provide evidence for substantive changes to the current EU doctrine on medical support, the 'Comprehensive Health and Medical Concept for EU-led Crisis Management Missions and Operations.' The main recommendation is incorporating LFOs into the future revision of the EU Medical Doctrine (expected in 2017) thus making a clear requirement for medical support provision for LFOs and seeking to facilitate overarching harmonisation and standardisation of medical support practices.

Improve harmonisation and standardisation for greater interoperability between forces medical support

The study recommends focusing on opportunities to develop an overarching harmonisation and standardisation of medical support practices for all pMS, providing medical support to LFOs. An overarching EU Operational Patient Care Pathway could set out, in detail, the clinical requirements for EU missions, setting a common standard and framework, and providing a set standard of clinical requirements against which both planning and provision can be based. This would clarify the expectations, standards and timeframes when applying medical support during operations involving the pMS, and also enable the easier exchange and transfer of equipment and personnel from different units and countries.

Reconsider the concept of Roles and options for potential modularisation

The study found that the challenges faced by current practices of medical support indicate that the current Role system in medical planning may not be best suited for LFOs. The Role formations are designed and intended for larger military formations and are therefore arguably too expensive and capability intensive for the medical requirements for an LFO. The Role concept should be reconsidered and incorporate views on potential modularisation of units, such as a Forward Deployed Surgical Unit.

Consider opportunities for multinational cooperation in the development and deployment of new technologies

There is scope for developing new technologies that could be deployed to benefit medical support in a military context. Currently, the development of new technologies appears to fall in two approaches. First, building on existing technologies and making them fit for military operations or increasing the functionality, reducing its weight, size, or improving its capability. Second, developing radically new technologies in areas not

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already being explored. In order to achieve technological innovation, the study found that a partnership among several actors would be most effective. The study recommends that nations find opportunities to collaborate in order to identify and pilot new technologies.

There is some caution recommended with regards to the deployment of new technologies in providing medical support. For instance, the study found a number of risks that are related to the military becoming increasingly reliant on technologies in operational environments. To address these concerns the study team proposes that the EDA establishes a forum on ethical, legal, doctrinal and practical implications of increased use of new and disruptive technologies in military operations.

Seek to develop and nurture engagement and cross learning between the military and civilian medical community

Finally, the study found a number of crossovers between military and civilian medical community in the domains of training of medical professionals and the make-up of deployed medical staff, medical practices of information sharing and medical technologies. To address the synergies and concerns, the team suggests that EDA assumes a role in trust and cooperation building among the stakeholders. There are a number of lessons that can be learned across the communities which would benefit the medical support provision. Furthermore, the EDA could further explore how the civilian military skill sets and experiences could benefit both communities.