MCDC Cycle 2019-2021 Project Report:

Medical Modular Approaches:

Medical Modular Approach-Employment (MMA-Emp)

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MEDICAL MODULAR APPROACHES – EMPLOYMENT

A HANDBOOK FOR A MODULAR APPROACH TO MEDICAL SUPPORT

Multinational Capability Development Campaign

2019 – 2021

Distribution

Project Participants and Roles

Focus Area Project Lead(s): the Czech Republic

Contributing nations: Finland, Germany, the Netherlands, Norway, Romania, the United Kingdom, the United States, European Defence Agency (EDA) and the NATO Military Medicine Centre of Excellence (MilMed CoE).

The Multinational Capability Development Campaign (MCDC)

The MCDC is a solution-focused analytical and developmental initiative led by the Joint Staff of the United States Department of Defense (DoD) evolved largely from the NATO-led Multinational Experiment (MNE) programme. Initiated in 2001, the NATO MNE programme supported experimentation in a variety of areas through a series of Multinational Experiments culminating with MNE 7 in 2011-2012. Following the success of MNE 7, the U.S. DoD continued to build the forum through a 5-year campaign consisting of three, two-year cycles as the Multinational Capability Development Campaign. MCDC aims at creating the conditions for collaborative development and assessment of concepts and capabilities addressing critical shortfalls or concerns of the participating nations.
The MCDC Theme for the 2015-2021 cycle is “Interoperability for Future Combined Joint Operations.” Modular Medical Approaches – Employment (MMA-Emp) is one of the nine projects comprising the 2019 – 2021 campaign cycle. The project is executed under the leadership of the Czech Republic.

Linkages

Multinational Capability Development Campaign (MCDC) Executive Steering Board (ESB) recognized high importance to carry out completion of the MMA concept of employment (CONEMP) of medical modularity, which was initially identified as a goal for 2017-2018.
On March 21, 2019 ESB finally endorsed, that the 2019/2020 MCDC Medical Modular Approaches – Employment (MMA-Emp) project would be conducted as a SD 1.1265 Project, dedicated to address solutions how to mitigate recognized shortfalls of deployable medical capabilities within NATO/EU area of responsibility.

Analysis and development activities in the MMA-Emp projects are closely linked to on-going concept and capability development efforts in NATO and EU, but MMA-Emp is also building upon Conceptual Framework for a Medical Modular Approach to Medical Support document developed by nations and organisation involved in MCDC MMA 2017-2018 cycle. The continuation gives the same stakeholder a unique opportunity to continue and evolve the MMA documents which provided a conceptual basis for capability and doctrine development based on modularity of multi-national medical support capabilities. The handbook is also closely tied to NATO's Smart Defence Initiative (SDI) project 1.1015 addressing pooling and sharing of Multinational Medical Facilities and the EDA Multinational Modular Medical Unit (M3U) project which seeks to apply the principles of modularity to European Union (EU) member nations' support to EU operations.

PREFACE

With the end of the Cold War in 1995, western nations and the North Atlantic Treaty Organization (NATO) entered a new era in security and defence. No longer defined by the persistent threat of major conflict between near-peer competitors, the focus of planning and operations shifted to other missions and threats across a broader spectrum, including such efforts as peace-keeping, nation building and assistance to humanitarian relief operations.

Defence planning today is based upon several factors which demand levels of flexibility, adaptability and responsiveness necessary to respond to a dynamic strategic and operational environment characterised by:

- Hybrid warfare,
- Advanced reconnaissance - weapons and information systems technology,
- Extension of the battlespace beyond traditional and conventional norms,
- Need for increased efficiency/cost-effectiveness due to economic factors, and
- Need to integrate with non-traditional assets and resources.

Accordingly, medical planning has experienced the need for a shift to more dynamic, responsive and bespoke capabilities to support rapidly evolving demands. Several factors complicate this:

- Limited interoperability between nations and even between providers,
- Rigid, ineffective or inefficient command and control (C2) systems,
- Limited civil-military interoperability, and
- Limited experience in the employment and integration of medical modules.

In 2015, NATO initiated its Smart Defence Initiative (SDI) in part, to address these challenges, seeking to revitalise a 'culture of cooperation' to 'operate and maintain capabilities' with a view to efficiently and effectively harmonise requirements, pool and share capabilities, set priorities and coordinate efforts. The EU undertook similar efforts through the European Defence Agency (EDA). In 2016, NATO and the EDA agreed to co-leadership of this project under the Multinational Capability Development Campaign (MCDC) to address potential for pooling and sharing of medical resources through a Modular Medical Approach (MMA). The support and involvement of nations and organisation under the lead of the Czech Republic help continuation and evolvement of MMA by transforming the conceptual work into handbook under the Modular Medical Approach-Employment (MMA-Emp) project.

The MCDC-MMA project explored the requirements for and potential challenges associated with modularisation and integration of medical elements to meet demands of current and future missions in this increasingly diverse and demanding environment. This document is the result of the analysis and exploration into the conditions, problems and requirements associated with providing assurance of standards in the patient journey from point of injury to definitive care. This work provides a basis of a concept for a modular approach to medical planning and service provision. It has been developed through analysis of requirements, identification of potential solutions, assessment of risk and supporting experimentation.

Supporting documentation and project artefacts are archived and available by contacting the MCDC National Director of via the All Partners Access Network (APAN) at www.apan.org. Additional information on this programme is available through the NATO MCDC National Director or the EDA MCDC National Director.

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Vitezne namesti 5

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PART I

INTRODUCTION

Consistent effort has been expended by NATO to build a basic framework for medical modularization since the Strategic Concept for the Defence and Security of the Members of NATO was adopted in November 2010. In previous campaigns, NATO and the EU had independently developed project plans to build buy-in for MMA among their member states. Since the projects' initiations, NATO's Smart Defence Tier 1.1015 "Pooling & Sharing Multinational Medical Treatment Facility (ROLE2)" and EDA's "Multinational Medical Modular Unit (M3U)" identified similar challenges and capability gaps relating to MMA. Likewise, the EDA and the NATO Centre of Excellence for Military Medicine located in Budapest, Hungary have established an open information exchange to ensure MMA efforts avoid duplication among overlapping member nations.

In 2015, NATO initiated its Smart Defence Initiative (SDI) in part, to address these challenges, seeking to revitalize a 'culture of cooperation' to 'operate and maintain capabilities' with a view to efficiently and effectively synchronize requirements, pool and share capabilities, set priorities and coordinate efforts. The EU undertook similar efforts through the European Defence Agency (EDA).

Improvement of medical support to operations has been a recurring theme of the 2015-20 campaigns. In the 2015-16 cycle, the Medical Interoperability in Coalition Operations (MEDICO) project established a firm foundation based on rigorous review of extant medical doctrine resulting in development of a draft "Memorandum of Understanding (MOU) for Co-Operation for Common Operations of Multinational Modular Medical Treatment Facilities (M3TF)". Building upon this in the 2017-18 cycle, the Medical Modular Approach (MMA) project defined organization, procedures, and requirements and standards enabling highly adaptive M3TF organization based on modularity; a concept based on the ability of medical capabilities to separate and recombine increasing flexibility and responsiveness.

Outputs from the 2017-18 cycle have established the conceptual basis for modularity in medical support to be worked out in the follow-on cycle. Eight nations (CZE, DEU, FIN, GBR, NLD, NOR, ROU and USA), supported by EDA and MILMED COE recognized high importance to carry out completion of the concept of employment (CONEMP) of medical modularity, which was initially identified as a goal for 2017-2018 and agreed to take over leadership of the 2019-20 MCDC MMA-Emp cycle. Under the lead of the Czech Republic, the project addressed solutions for how to mitigate recognized shortfalls of deployable medical capabilities within NATO/EU areas of responsibility by developing a handbook in order to enforce and improve the medical planning process of an M3TF.

This initiative leveraged parallel lines of effort within NATO, the EDA, the Nations and other international organisations as necessary. This MCDC project tried to maximize returns on individual investments, while fully respecting fiscal property by keeping such investments within each organisation's and nation's boundaries.

1. Purpose

The purpose of the MCDC MMA-Emp Project is to implement MMA CONEMP into respective documents, in order to:

- Enable the development as well as operational employment of medical capabilities based on output defined module,
- Enhance effectiveness in pooling and sharing of scarce medical support resources,
- Ensure that medical support is optimised for the tasks it will be required to perform,
- Avoid unnecessary deployment of assets and tailor the medical footprint to only that what is required,
- Facilitate the development of an organisational structure which will make medical support more flexible, adaptive and resilient,
- Support joint reception, staging, onward movement, and integration (RSOMI) and interoperability of contributions from different providers, and
- Rearward movement staging and dispatch (RMSD).

MMA-Emp Handbook aims to provide an operational tool for:

- Development, procurement and provision of defined modular contributions from different providers (this includes Troop Contributing Nations (TCNs), Civil Organizations and/or commercial contractors (TCNs/providers in text),
- A modular organization of medical capabilities within a modular, multi-national, inter-agency, cross-organizational end-to-end medical support system,
- A modular configuration and enhancement of medical assets, treatment facilities and units,
- Coordination and RSOMI/RMSD of medical capability modules within a multinational cross organisational end to end medical support system, and
- Simple, flexible plans, clear, concise orders and procedures, in order to minimize misunderstanding and confusion.

2. Goal

The medical modular approach concept employment provides a guidance of MMA modules´ utilisation, in order to gain an overall better understanding how to optimise complex matrix functions of highly flexible, multi-nation, mission-tailored modular treatment facilities. These medical units and facilities will adhere to a dependable deployable standard, rather than the current model whereby ad hoc capabilities are cobbled together to support a major operation, to guarantee the best medical practices are employed, and patients are afforded a complete continuum of care from battlefield injury to post-surgical recovery in home.

MCDC MMA Emp Handbook is providing guidance to those involved in health service support employment within defence planning, operations and exercises. The successful planning, execution and support of military operations require a clearly understood and widely accepted doctrine, and this is especially important when operations are to be conducted by multinational or coalition forces.

Short-term Goal (2019-2020 Cycle, extended 2021): utilising MMA CONEMP in order to produce a MED Commanders´ tool for identifying gaps, challenges, and/or other interoperability issues of MMA-Emp in (predeployment/deployment/redeployment) phases of the Role 2 Basic M3TFs preparation. The goal of the 2019-2021 MCDC Medical Modular Approaches – Employment project is to produce a set of guidelines to aid the medical planning process by

identifying and mitigating risks inherent in delivering multinational medical capabilities outside of Lead Nation (LN) and Framework Nation (FN) constructs. These will not be prescriptive but illustrative of the scope of issues that will need to be considered, both physical and conceptual, to ensure that any multinational modular medical facility functions safely and effectively, meeting the assurance standards of all nations involved in its federation.

Mid to long-term Goal (2021-2022): Design testing and validation of the MMA Emp Handbook.

MMA-Emp will provide an executable model to enable pooling and sharing of medical capabilities from different providers as well as a flexible construct to tailor an end-to-end medical support system through an optimisation of the medical system lay down. As a result, MMA-Emp will enhance medical support effectiveness and resilience throughout the spectrum of combined and joint operations. Enhancements will be achieved through reductions in the medical footprint required to ensure medical and overall logistics support. MMA-Emp will address major shortfalls in personnel and resources, achieve interoperability at the M3TF level, and standardise preparation, equipping, manning and deployment of medical modules.

3. Documents related to a modular approach for medical support

Some ideas, aspects and principles of MMA concepts and projects found their way into doctrinal and even policy documents. Examples for international doctrinal documents reflecting some aspects of modularity in medical support are:

- MCDC Cycle 2017-2018 MMA Project Report: Conceptual Framework for a Modular Approach to Medical Support,
- AJP-4.10(C) Allied Joint Doctrine for Medical Support,
- AJMedP-9 Multinational Medical Support,
- AMedP-9.1 Modular Approach for Multinational Medical treatment Facilities,
- AMedP-9.2 Guidelines for a Multinational Medical Unit,
- AMedP-1.7 Capability Matrix, and
- Comprehensive Health and Medical Concept for EU-led Crisis Management Missions and Operations.

INTEROPERABILITY DIMENSIONS EXPLANATION

The MCDC MMA 2017/2018 project identified four dimensions of interoperability in the Multinational Medical Modular integration:

- Human: concerning potential interoperability issues resulting from differences in language, cultures, or other non-medical issues. Also this may include: education, common terminology, training differences, staff interoperability, personal interaction, establishing and meeting training requirements, normalization of national and cultural differences in medical practices etc.;
- Procedural: concerning medical or organizational procedures, this may include: NATO standards, policy, doctrine and directives, Standard Operation Procedures (SOPs), Standard Operation Instructions (SOI's), lack of common terminology, chain of commands, etc.;
- Technical: concerning medical equipment and supporting systems interoperability, this may include hardware, medical equipment, connection, interfaces, etc.;
- Information: concerning interoperability issues associated with the transmission, reception and understanding of official and unofficial communications necessary to effectively integrate modules, this may include: technology systems and software applications to communicate, exchange data, and use the information that has been exchanged, Command, Control, Communication, Computers and Information (C4I), timeliness, comprehensiveness, access, acceptance, etc.

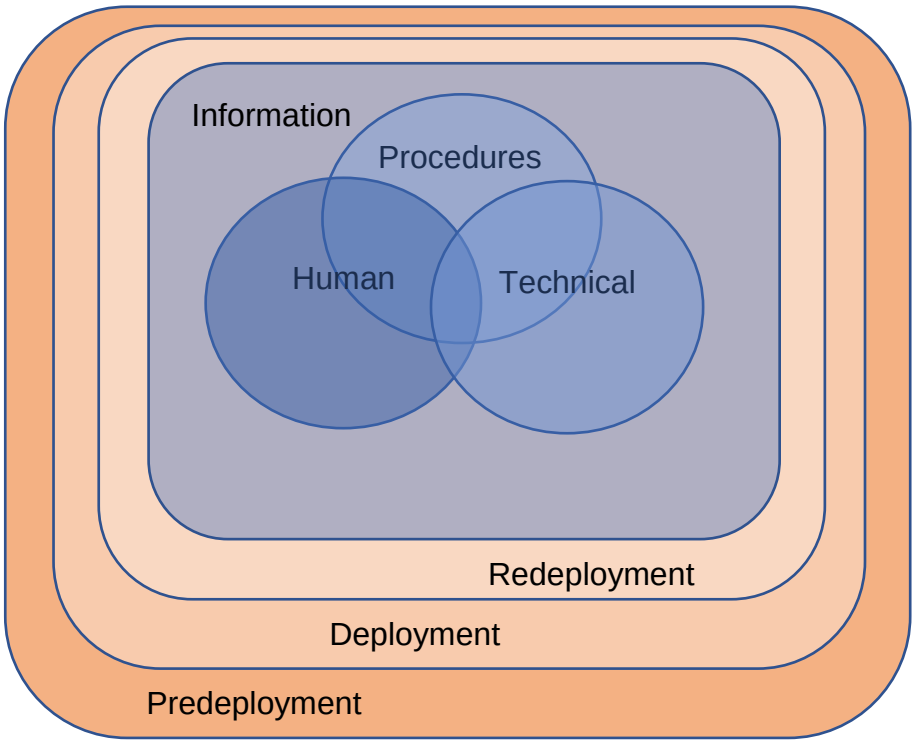

Figure 1 ***Scope of MMA-Emp project showing four-dimension integration across the deployment cycle.***

The MMA-Emp Project has refined this to three dimensions, with the fourth (information) cross-cutting all others. Therefore MMA-Emp will focus on three main dimensions, the procedural, human and technical; all of these are underpinned by the information dimension. Successful integration of these dimensions, across the all phases of the deployment cycle, will enable the safe deployment of a truly multinational modular medical facility (Figure 1).

Success, however, cannot be taken for granted and the generation of any multinational modular medical facility needs careful and thorough planning. The MMA-Emp (MCDC Cycle 2019/2021) developed this, using Role 2B capability as an example, and generated a planning tool that any coalition of nations can use to support their operational planning process.

1. DOTMLPF-I Explanation

Taking in consideration chances and benefits but also challenges and obstacles related to a capability-based modular organisation of medical units, treatment facilities and assets, in order to develop an Operational Medical Support Tool, related to modularity.

This MMA-Emp Handbook reflects the results of workshops, observations and findings from experiments as well as lessons from exercises and operations. It provides doctrine, organisation, training, materiel, leadership, personnel, facilities and interoperability (DOTMLPFI) related conclusions and recommendations for the development and provision, for pooling and sharing, employment and coordination of capability based medical support modules within the framework of an M3TF (Role 2B and higher).

Identifying and addressing the DOTMLPFI characteristics of the MMA-Emp is an essential precursor to development of a concept for employment as due consideration should be given to each dimension. The DOTMLPFI construct is widely recognized and accepted as capturing the elements for both concept and capability development and use of the framework is beneficial.

Doctrine

Agreed common approaches to the development and application of doctrine is a key to its success. Nations develop their military medical capabilities in line or accordance with national health legislation, systems and policy. Doctrinal alignment is critical to achieving the desired levels of interoperability across the operational dimensions and functions.

Organization

The organization of medical support capabilities must be optimised in order to generate and sustain the medical effects required to support the commander's mission.
Organisational structure of the end-to-end medical support system must reflect the organisation and responsibilities nations/providers are willing to provide commanders to facilitate adaptive response to operational need. Traditional military hierarchical structures need to be transformed into more federated, networked and self-synchronizing structures which provide the flexibility and adaptability necessary to address the dynamics of the future operational environment. Such self-synchronizing structures enable implementation of the MMA providing adaptive organisation and command and control.

Training

TCNs/providers are responsible for training medical personnel and modules prior to deployment. For the Medical Modular Approach this implies the individually-provided modules are assumed to be trained and qualified for their task. In order to provide medical support at best medical practice level, additional training is critical to enabling harmonisation of procedures and drills among several modules. This training and harmonisation should make sure all differences in procedures, equipment or standards will be discovered and understood so all the possible issues can be solved, and risks can be mitigated.
The MMA enables deployment of end-to-end medical systems to support any type of operation in any environment. A reliable modular medical system requires modules able to cooperate, collaborate or integrate with modules of other nations or organizations. Respective training of these modules should focus on the necessary level of flexibility to prepare modules for cooperating effectively in a JIMP environment.

Materiel

Materiel (equipment, supplies, maintenance, etc.) includes all items necessary to equip, operate, maintain, and support medical capabilities within the end-to-end medical support system. The materiel must be optimised to operate effectively in multinational operation and mission in order to provide a concrete linkage between requirements and resources together with increasing emphasis on joint interoperability.

Leadership

Leadership at all levels must create conditions where mutual respect and trust among TCNs/providers will be generated through factors such as understanding and respect.
For MMA to be successful, there is a need for leadership that facilitates necessary shifts in culture, mind-set, and force development planning and operational execution. Leadership encompasses responsibilities and authorities. At the political-strategic level this includes TCN/provider responsibility to assure standards of care equating to best medical practice for their troops.

Personnel

There are no commonly agreed standards for the number, education/training level, or qualifications of personnel defined for modules. What is defined is the output/effect the module is expected to deliver or provide. It is the responsibility of nations/providers to provide the respective skill mix to deliver the medical effect.
In a flexible and agile environment personnel need to adapt to the environment demands in the same way as the whole system. An end-to-end medical support system based on medical modular approach can only be as agile and flexible as its personnel.

Facilities

Facilities (a base, camp, buildings, structures, air, maritime or other type of platform) encompass provision of real-life support and shelter. Facilities need to be mission-tailored and allow integration or separation of medical support modules. They should be compatible, sustainable, secure and adaptive to the changes in the JIMP environment. Traditional support and sustainment principles define responsibilities for higher to support lower, for left to support

right and supported to supporting. This traditional military concept may be challenged applying the MMA, necessitating modules to adapt to the supported capability.

Interoperability

In a medical system based on Multinational Medical Approach, the level of interoperability is of great importance. As all participating modules will follow procedures and standards set by the respective nation/provider, harmonisation among these procedures is required for the MMA to succeed. The expected performance output of each module should be clearly defined to identify and address both gaps and overlaps between the modules resulting from differing procedural standards. All possible issues resulting from gaps over overlaps should be solved and the possible risks should be mitigated.

2. Information dimension - complementarity

Information is a cross-cutting dimension that supports and enforces the other three dimensions (human, procedural and technical). Information dimension of interoperability significantly influences and underpins all three phases. Its cross-cutting and combining functions play significant roles and contribute to decision making by supporting the M3TF with the whole range of data from basic module communication (simple messages exchange) up to transferring confidential data or an overarching medical CIS/operational CIS system. The information completeness, timeliness and accuracy during each phase must support M3TF tasks.

The M3TF Commander must identify the requirements and nations should support and provide adequate communication and information systems (CIS) for tentative Courses of Action (COA). The estimation should also address the adequacy and security of networks used to manage, store, manipulate and transmit operational and logistic data. From the beginning, the CIS may be a limited resource, which will require detailed planning to ensure the appropriate level of communications resource allocations available to maintain visibility. Initial phases of a predeployment and deployment may not have the robust communications network required for extensive use of information systems. Deploying CIS early provides a system that enables the M3TF Commander to develop visibility of the force. In addition, throughout the process of predeployment/deployment/redeployment, the role of cyber defence must be considered in order to allow reinforcing M3TF resilience against possible cyberspace incidents.

All phases - predeployment, deployment and redeployment are reliant on information. Each phase requires a different set of information. A dedicated medical C2 structure must support and be capable of planning, executing, controlling, supporting and auditing the full spectrum of medical support functions within M3TF. The medical system should seamlessly provide all resources required to support treatment within M3TF, evacuation and flow of information from initial point of wounding, injury or sickness via M3TF through evacuation to definitive treatment and final disposition. Facing a lack of information can hamper fulfilling mission tasks or can lead to failure. In each checklist the basic set of questions related to the information dimension is added.

3. Human dimension

The next part of the chapter will focus on the human dimension, which has been defined as:

'The human dimension is about leader and fellowship, social and communication skills but also professional flexibility which are essential to ensure effective teamwork and cooperation and to overcome language barriers as well as different standards in education, training and credentialing'[1]

As a given, it can be stated that a system can only be as strong as its weakest link. Every link in a system should be reinforced equally to strengthen the system as a whole. In a medical system, as described in the Medical Modular Approach, this implies all recognized dimensions should be reinforced equally to be able optimise the medical system in its functioning.
For the human dimension this reinforcing will bring different kinds of challenges, compared to the other dimensions. Where in a technical dimension, challenges can be solved by technical solutions (like buying or creating new equipment), or in the procedural dimension challenges can be solved by mutual agreement to have or write procedures, the human dimension has a very complex element in it: the human being. While technical or procedural solutions can be physically created by humans, solutions in the human dimension can only be created by influencing human mind or human behaviour, which might need different approaches for every typical group of persons or maybe even for individuals. It might be this kind of complexity of the human dimension compared to the other dimensions, that makes a lot of operational planners forget (or ignore) the importance of human factors. As Elm, Gualtiere, & McKenna (2008) concluded: "*people are included as part of the definition of a system, but their role in that system is generally poorly specified, and the focus of the (system) engineering effort is on the technology components*"[2].
For a multinational medical modular system to be effective, it is necessary to make sure interoperability is guaranteed in all dimensions of the system. Interoperability can be described as "*the ability of a system to provide services to and accept service from another system for them to operate effectively*"[3]. Understanding the complexity of the human dimension is necessary to be able to create human interoperability. Doing so is a prerequisite for designing an effective modular system as interoperability on other dimensions will most likely function less effective without an effective human dimension. Handley (2013) concluded after a study on human interoperability, that by understanding and incorporating human interoperability requirements, the resulting system design can more effectively support collaborative tasks across technological environments to facilitate timely responses to events[4].
To create human interoperability in a multinational modular system, it is necessary to facilitate an environment in which humans with different backgrounds will have the ability to operate effectively. It will require an environment in which people can accept, cooperate, communicate, trust and respect, regardless of the possible differences of intangible phenomena, like for instance culture, with huge impact on behaviour. These "soft barriers" in the human dimension must be overcome in order to make any multinational modular system work effective as a whole.

[1] MCDC Cycle 2017-2018 project "Medical Modular Approaches"
[2] Elm. W., Gualtiere, J., & Mckenna, B., (2008). Integrating cognitive systems engineering throughout the systems engineering process. *Journal of Cognitive Engineering and Decision Making*
[3] Jain, R., Chandrasekaran, A., & Erol, O. (2010). A system integration framework for process analysis and improvement. *Systems Engineering*
[4] Handley, H.A.H,. (2013). A Network Model for Human Interoperability. *Human Factors*

During a study and experimentation on human interoperability at the Naval Postgraduate School (Monterey, California)[5], barriers of several types have been recognized that often afflict the effectiveness and efficiency with which organisational entities interact:

- Policy barriers: differences in policy (legal, political, medical) may prevent partners in a multinational environment from collaborating effectively.
- Structural barriers: differences in organization structure may disturb interfaces, or effectively disable them, through which interaction between partners should occur.
- Process barriers: differences in procedures for sharing information, for making decisions, in tasks or responsibilities which make systems of the collaborating partners incompatible.
- Data interoperability Barriers: when data input cannot be used by another party because of difference in type of data or language.
- Cultural barriers: Culture is one of those phenomena having huge impact on people's behaviour. Culture is to a human collective, what personality is to an individual. It is "the collective programming of the mind which distinguishes the members of one human group from another" (Hofstede, 1984)[6]. Differences can lead to a lack of trust, misunderstanding, behavioural conflicts, leadership differences, and many more challenges in collaboration.
- Cognitive and affective barriers: differences in knowledge and skills or mutual acceptance of each other's potential, which can hamper developing mutual trust and other requirements of relationships to collaborate efficiently and effectively.

Within every recognized and described barrier, aspects of human interoperability are afflicting the efficiency and effectivity of the interaction. For the MCDC Medical Modular Approach Employment Human Dimension, two steps will be made to create a usable format for the MCDC MMA-Emp Handbook: step 1 diverging to get a maximum of information, step 2 converging the information to create overview. This way organizational barriers will be transformed into groups of tangible human aspects, based on human character.

[5] Gallup, S., Freeman, J., Murch, R., Smith, T., Moore, H., Glynn, A., & Cholton, J. (2008) Human Interoperability; experimentation to understand & improve the human component of complex systems

[6] Hofstede, G. (1984). *Culture's consequences: international differences in work-related values*

This process is visualised in the following figure:

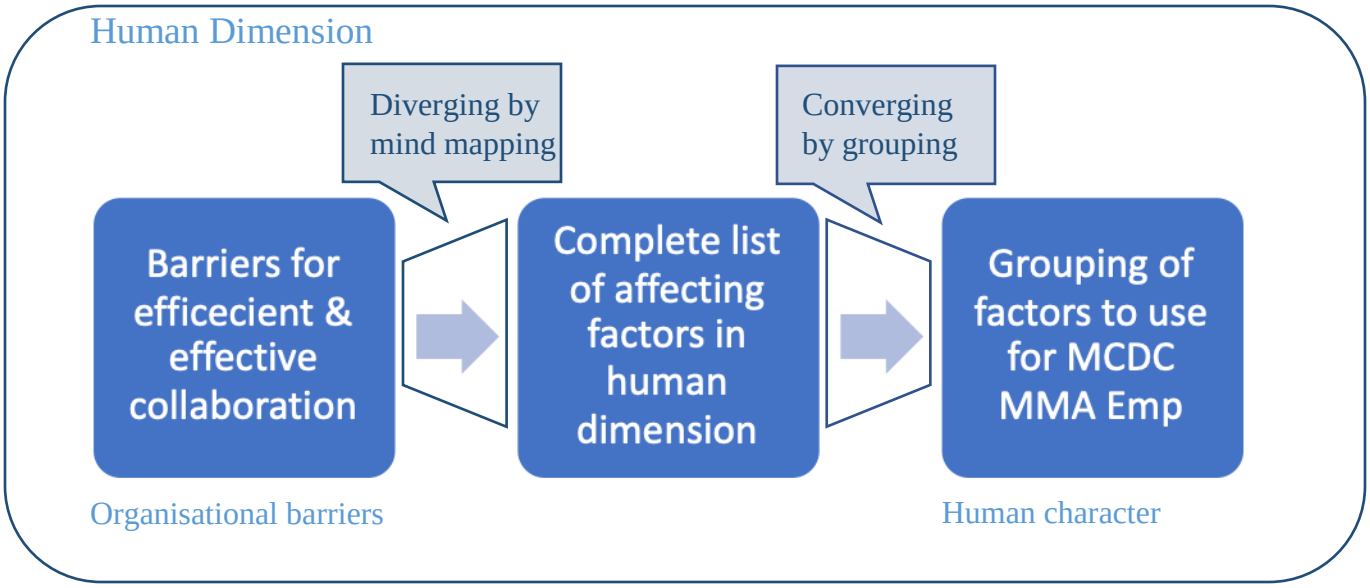

Figure 2 Process of creating MCDC MMA Handbook for Human Dimension by diverging and converging

As a first step the barriers, described by Gallup et al (2008), are used as the fundament of creating a mindmap, trying to get an overview of human aspects that might hamper interoperability in a multinational medical environment resulting in a complete as possible list of factors in the human dimension.
Secondly this list will be grouped to create an easy understandable working document to use for recognizing, mitigating or solving all possible human constraints during predeployment, deployment and redeployment of a multinational medical unit.
After the grouping of all mentioned aspects, the complete description of understanding, mitigating or solving the possible constraints within the human dimension will be described in further detail in the respective chapters for predeployment, deployment and redeployment.

Step 1: Diverging organisational barriers to human aspects
Based on the foundation of the described organisational barriers, a creative process of mind mapping creates a list of human factors affecting the efficient and effective collaboration in a multinational medical environment. This list will never be complete, as human aspects can differ for every individual or group of individuals. However the list, and the complete MCDC MMA-Emp document, can be used as a tool to recognize the major issues in the human dimension of medical modular approach and can always be adjusted during any planning process.

The mind map is shown in the next figure:

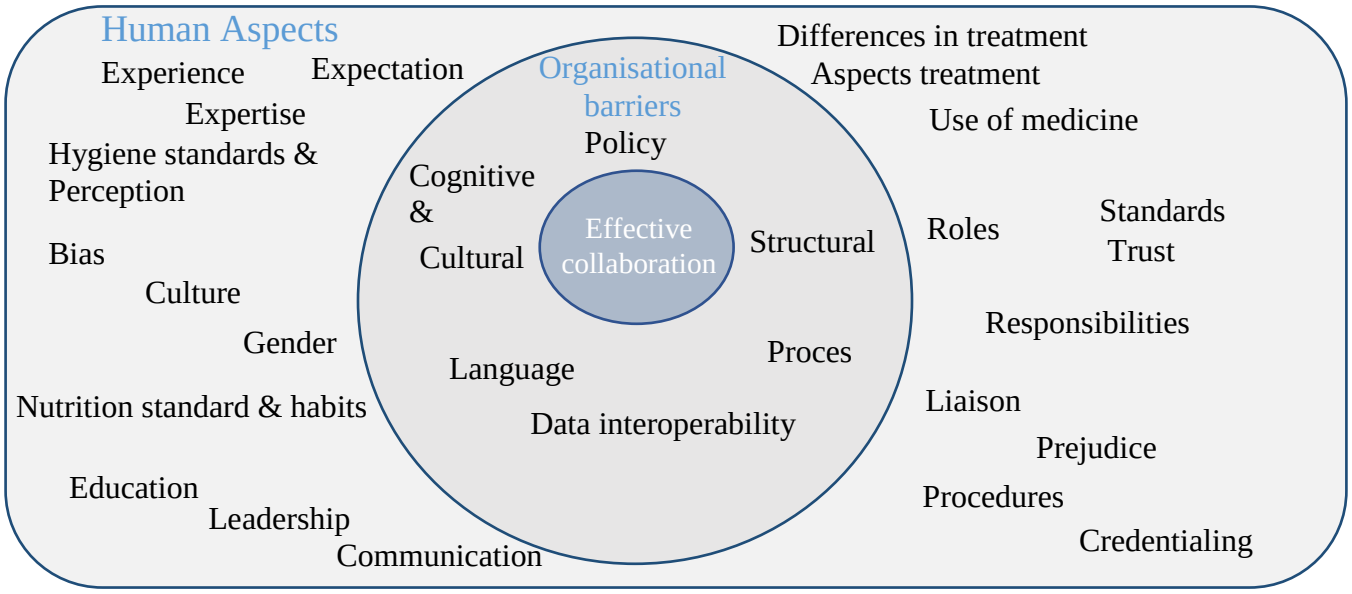

Figure 3 Mind map of Human factors

Step 2: Converging the human aspects by grouping:

To create a working tool for planners or commanders for the respective phases of deployment of a medical unit, the list of human factors has to be usable and logic. The result of the mind map is a collection of human aspects. An assessment of all factors and grouping them on similarity in human characteristics, leads to a manageable number of groups. These groups will be the foundation of the working tool for the MCDC MMA-Emp Human Dimension.

The assessment of the working group resulted in five groups:

The first group is "*Qualification and Language*", covering all aspects of the ability to communicate in the professional working area. There is a strong relationship between school/university education and language skills. Comparable education or language skills help in understanding qualification levels within other countries, building up a corporate identity and evaluating differences in medication use or patient treatment of participating nations.

The second group is "*Leadership and Command*", describing all aspects of different ways of leading organisations as well as national regulations. When personnel from different nations work in one facility at least some problems concerning leadership and command might occur. There has to be a common sense of what the different roles within the facility consist of, what national and international responsibilities are, and what the consequences of the Transfer of Authority are for these responsibilities.

As a third group "*Training and mutual trust*" will be described. Mutual trust is essential and based on awareness and acceptance of each other's competences, which can be increased by training. Getting acquainted with each other's procedures and standards is a prerequisite for a successful collaboration within a medical facility.

The fourth group is "*Culture, ethics and religion*", a mix of the most intangible human aspects which have significant influence on behaviour of individuals or groups of individuals. Within this group differences of treatment within different cultures should be considered, as well as the prejudices between the different cultures, and the bias personnel might have on groups based on culture, religion or gender.

The fifth group is "*Health and nutrition*". This group is based on differences in habits or type of food, alcohol consumption, amount of calories consumption per day, food preparing and -storing. There might be a different perception of health or hygiene, or standards of nutrition within a multinational environment. These differences can be as well in the medical profession or environment as in the personal sphere.

The grouping results in a schedule of groups and factors in the human dimension, shown in the next figure:

MCDC MMA-Emp Human Dimension	
Group	**Factors**
Qualification and language	Medication Language Skills Education Qualification Levels Credentialing
Leadership and command	Roles Responsibilities Leadership Liaison Communication
Training and mutual trust	Procedures Standards Trust
Culture, ethics and religion	Cultural treatment differences Prejudice vs. own experience Gender Bias
Health and nutrition	Nutrition standards Nutrition habits Hygiene standards Hygiene perception
Environmental standard	Environmental standards and aspects Environmental evaluation

Table 1 Schedule of Groups and Factors in the Human Dimension

The schedule with groups and aspects within the human dimension as shown above, will be used in Part II of the document to describe the possible constraints in the human dimension for the Medical Modular Approach during the predeployment, deployment and redeployment phases. In the Annexes of the document, the schedule will be used as the foundation for the Human Dimension part of the MCDC MMA-Emp checklist.

4. Procedural dimension

This chapter will focus on the procedural dimension, which has been defined as:

'Concerning medical or organizational procedures and the level to which they inhibit or encourage seamless interoperability between modules of different nations. Procedural issues may include: NATO standards, policy, doctrine and directives, SOPs, SOI's, lack of common terminology, chain of commands, etc.' [7]

[7] MCDC Cycle 2017-2018 project "Medical Modular Approaches"

In producing the MMA-EMP handbook and planning tool (MCDC 2019-2021) the procedural dimension definition identified has been re-interpreted to include medical and organisational procedures. This chapter will start by reviewing contemporary source materiel identifying the scope of the procedural dimension and will then focus on how this relates to each phase of the deployment cycle.

Literature Search

To establish the evidence base on which to develop MMA-Emp, a review was undertaken of English language source literature which describe multinational medical approaches from either a theoretical or experiential viewpoint. This included academic papers and post-operational / post-exercise reports. In each case the procedural definition was used to filter results and focus analysis. Multiple keyword searches were carried out of academic databases which identified 424 articles of interest. These were manually reviewed (abstract only) resulting in eight relevant papers which were reviewed in full.
An overarching conclusion, which supports the output of the MMA-Emp project, is that whilst alliances between nations (such as NATO) and other multinational initiatives (bi-lateral / tri-lateral agreements) view interoperability as a key enabler to success, the medical system is one of the most difficult to do so, due to a greater range of disparities. Thematic analysis of the papers identified six areas of procedural consideration:

- Capability definitions,
- Operating procedures,
- Governance, assurance and regulatory issues,
- Culture and language,
- Command and Control, and
- Real-life support.

Capability Definitions

To ensure the successful deployment of any M3TF it is vital that all TCNs/providers share understanding about what level of capability is to be deployed, what its constituent parts (the modules) are and how this will be delivered. For example AJP-4.10(C) identifies three variants of the Role 2 M3TF; Forward, Basic and Enhanced. When other factors such as the environment into which the M3TF will be deployed (land or maritime domain) and national interpretations regarding capability and capacity are considered, it can be seen that the potential for misunderstanding from the outset is a real possibility.

Operating procedures

The purpose of M3TFs is to support the operations and missions by preserving and restoring their health. This is achieved by having clearly articulated and SOPs and guidelines, as well as having robust clinical governance and assurance processes in place. TCNs/providers will be used to their own operating and safety frameworks, but the cumulative effect generated by combining these will build clinical risk into the system. One example of variance is national rules regarding the use of blood and blood products on personnel. Differences in national practices, standards of education and tolerance of risk need to be identified and mitigated, although a pragmatic line must be drawn in order to not become constrictively prescriptive by seeking complete uniformity of practice, but to concentrate on the M3TF processes needed to ensure its safe and effective operation.

Governance, assurance and regulatory issues

It has already been identified that combining medical modules from different nations may generate varying risks or problems. Clinical governance and assurance provide the process to ensure that the patient care pathway provided by an M3TF is as safe as it can be and satisfies the national requirements of TCNs/providers. Each contributing nation will train, prepare and employ healthcare professionals in-line with their own regulations and scope of practice. Any differences between nations which cross departmental boundaries need to be identified and reconciled. For this to be effective, assurance processes and performance metrics need to be agreed prior to the deployment of a multinational modular capability.

Culture and language

It is self-evident that commonality of language and terminology is essential for the safe and effective integration of modules from different TCNs/providers. For NATO missions the default language will be English or French, however for M3TFs generated through bilateral or trilateral agreements between coalitions of willing nations, this might not always be the case. Agreeing on a common lexicon is likely to be more pressing as, for example, even with English speaking nations, drugs can be known by different pharmacological and proprietary names. Cultural considerations, although relevant to the procedural dimension, are not discussed here as it is more relevant to the human dimension.

Command and Control

In addition to having a clearly articulated capability statement to focus the development and deployment of an M3TF, it is essential for the overall command and control structure to be established (including the transfer of appropriate command/control authority). The coordinating instructions for intra-facility working and the relationship between TCNs/providers and their own national component commanders must also be established. This will encompass both procedural instructions and CIS requirements (in the technical dimension).

Real-life support

The consideration of real-life support was identified from post-operational/post-exercise reports. Despite the earlier (and supported in literature) claim that it was difficult to achieve interoperability in medical services, real-life experience shows that clinicians will work together to overcome differences in practice and difficulties in the compatibility of equipment and consumables used at the tactical level. What is often not considered in advance, and becomes vital for the deployment of M3TFs, is the planning for which contributing nation will be responsible for power and lighting and how staff will be fed and accommodated. Leaders must ask, “How will modules from different nations be re-supplied? How will force protection be delivered?” Although outside of the medical sphere, these planning considerations and the procedures governing their provision need to be identified and addressed as part of the whole-force approach to the delivery of the M3TF.

Following review of the information sources during the scoping phase of the MMA-Emp project a series of deductions have been identified that will guide the development of a planning tool and provide the evidence-base behind it. They are:

- A clear statement of requirements is needed to fully articulate what the expected role/level of care of M3TF is before any discrete planning activity can be undertaken.

- The C2 architecture and associated transfer of national command/control authority must be established.
- SOPs must be developed for all cross-M3TF activities. Nations must agree/accept that intra-department (intra-module) SOPs are the responsibility of the TCNs/providers.
- A governance framework and performance metrics will be established to assure the delivery of healthcare across the M3TF to the satisfaction of all TCNs/providers. Where care delivery is contained within the remit of one nation (where other nations may not be able to assure practice), then it will ensure that its practices are acceptable and compatible to the other nations.
- A common lexicon is developed for use within the M3TF.
- Real-life support arrangements are as important as clinical considerations. They include (but are not limited to):
    - Force protection
    - Accommodation
    - Feeding
    - Ablutions
    - Power and lighting
    - Resupply and other logistical support (e.g. laundry, fuel)

Having established the scope of the procedural dimension through a review of available literature, this section will now consider how this is applied to the different phases of the deployment cycle.

5. Technical dimension

This chapter will focus on the technical dimension, which has been defined as:

'The technical dimension should provide clear understanding of equipment specifications and user instructions, of supply and maintenance requirements, compatibility of systems as well as of functional output and effects, and is essential to overcome technical differences through transformation, conversion, professional expertise or mind-set'[8]

The availability of medical equipment and materiel, even of seemingly insignificant items, can be of vital importance. The medical logistics system must contain expertise for the possible and likely implications of medical materiel support shortfalls and delays and be capable of responding to short notice clinical demands.

[8] MCDC Cycle 2017-2018 project "Medical Modular Approaches"

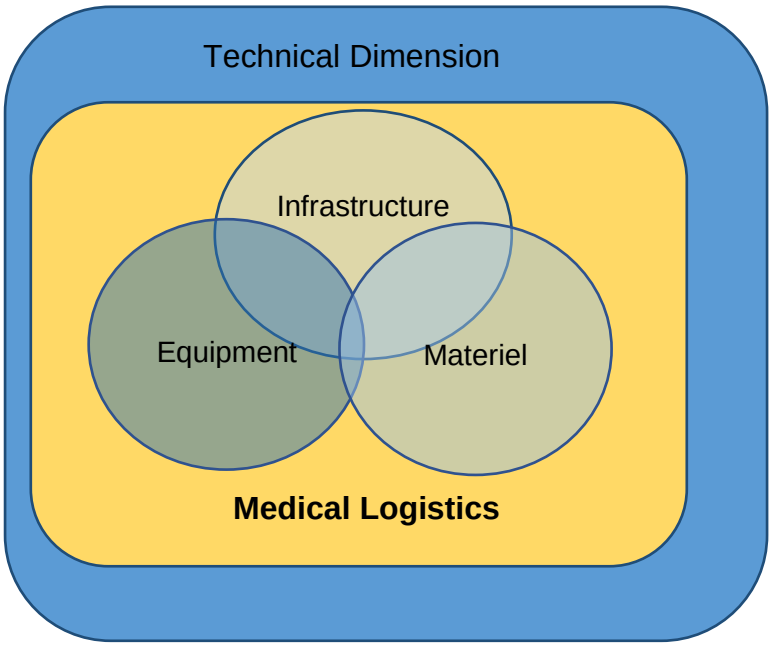

Figure 4 Scope of MMA-Emp project Technical dimension showing integration within Medical Logistics function

Main areas related to the technical dimension are equipment, materiel and infrastructure. Contributions from different providers may have different specifications, standards and technical requirements.

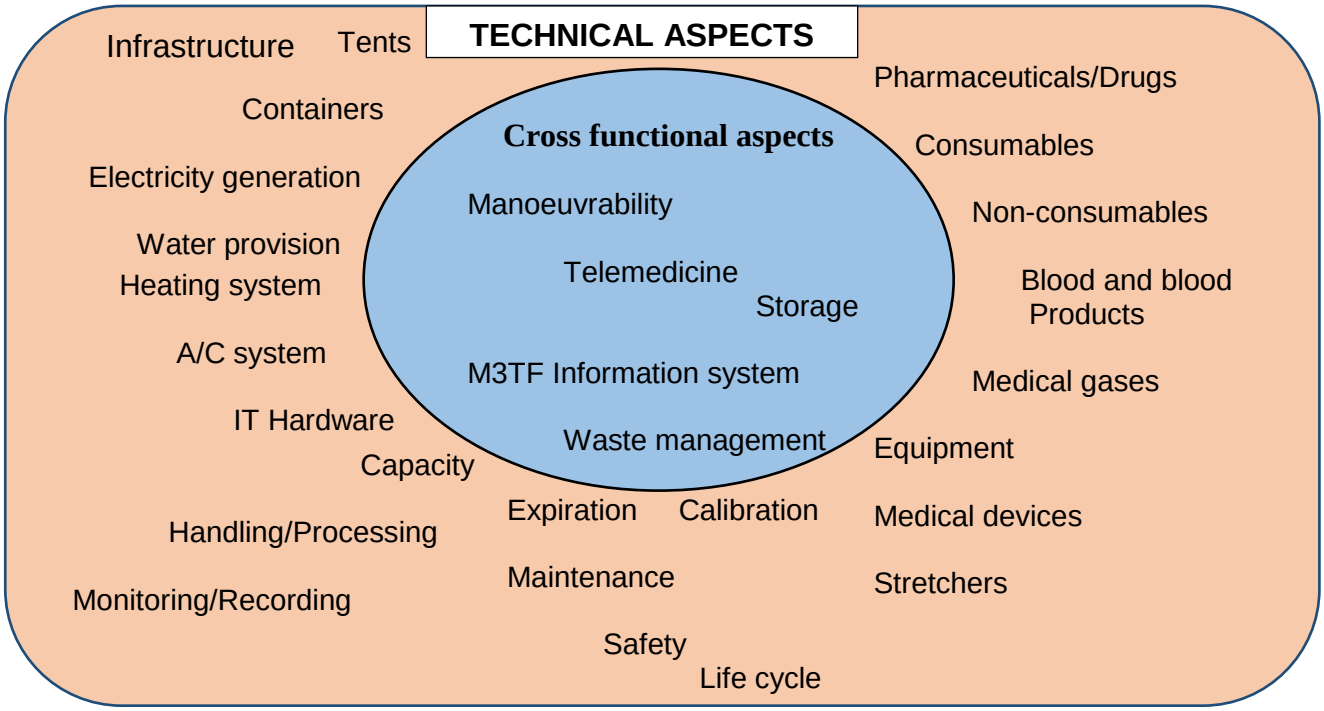

Figure 5 Mindmap of Technical factors

Equipment and Materiel

Equipment and Materiel also includes maintenance and supplies. They are necessary to equip, operate, maintain, and support medical capabilities within the end-to-end medical support system. The materiel must be optimised to operate effectively in multinational operation and mission in order to provide a functional linkage between requirements and resources.

The modular approach does not necessarily require common equipment and materiel. However, equipment and materiel used in an M3TF must be able to interact, connect and communicate, exchange data and services. Materiel, equipment, maintenance and/or supplies from different providers, military as well as civilian ones, must ensure a defined functional output/performance.

- Equipment and Materiel should be compliant with best medical practice and compatible with modules from other providers.
- Equipment and Materiel differences should not impact the transfer of patients, information or materiel exchange between modules, maintenance and sustainment of medical equipment, or procurement and distribution of medical supplies.
- Whenever possible the standardized procedures for the exchange and labelling at all levels within a theatre of operations should be established[9].

Infrastructure (Facilities)

Integration of and interaction between medical modules impose challenges on an M3TF. Modules must be compatible, sustainable, secure and adaptive to the changes throughout of all phases of operation.

MCDC MMA-Emp Technical Dimension	
Group	Factors
Medical Materiel and Supplies	Stretchers Consumables Non-Consumables Pharmaceuticals/Drugs Blood and blood products Expiration Exchange
Medical Equipment	Calibration Maintenance Safety Life Cycle
Infrastructure	Tents, containers and adapters Water connections, quality and capacity Electricity connections, voltage, outlets Back-up electricity system Heating System and A/C system CIS means incl. IT Hardware
M3TF Information System	Medical Software Network

[9] AMEDP-1.12 Medical and Dental Supply procedures

	Lexicon (language)
Telemedicine / Telehealth capability	Dedicated Hardware, Software, Bandwidth
Waste Management	Collection system (storage, bags and boxes) Deployable incinerator
Storage capability and capacity and sustainment of stocks	Capacity Capabilities
Transportability/Manoeuvrability	Transport means Special equipment

Table 2 Schedule of Groups and Factors in the Technical Dimension

Having established the scope of the technical dimension through a review of available literature, standards, and other sources these findings will be applied to the different phases of the deployment cycle.

6. Information dimension

The complementary information dimension is gaining more importance in today´s battlefield. The information interoperability is anticipated to have a significant impact on patient care. Creating an M3TF or any medical support system existing of modules from different providers based on the Medical Modular Approach necessitates clear communication, common understanding and straightforward sharing of information data and expertise. The (near) real-time information exchange between M3TF modules, an overarching medical CIS/operational CIS system as well as robust personnel and logistical systems are critical components. Compatibility of systems or at least accessibility of the lead system for all participants is indispensable. The lack of a common structure and interface can jeopardise M3TF tasks and in the end, also the patient care.

True interoperability is not possible without the shared use of the Knowledge Management process (figure 6 below) across all participating M3TF nations.

The data transmission, exchange and sharing information in a secure IT environment (classified or unclassified) should be the primary aim of all participating nations integrating M3TF.
Versatile network for transmission supporting the proper decision making process should include:

- MEDINTEL,
- MEDOPS,
- Operational C2,
- Patient flow information,
- Telemedicine and telemonitoring[10],
- Logistic system,
- Exchange and transmission of data within M3TF and between different modules.

[10] AMedP-5.3 Development and implementation of telemedicine system

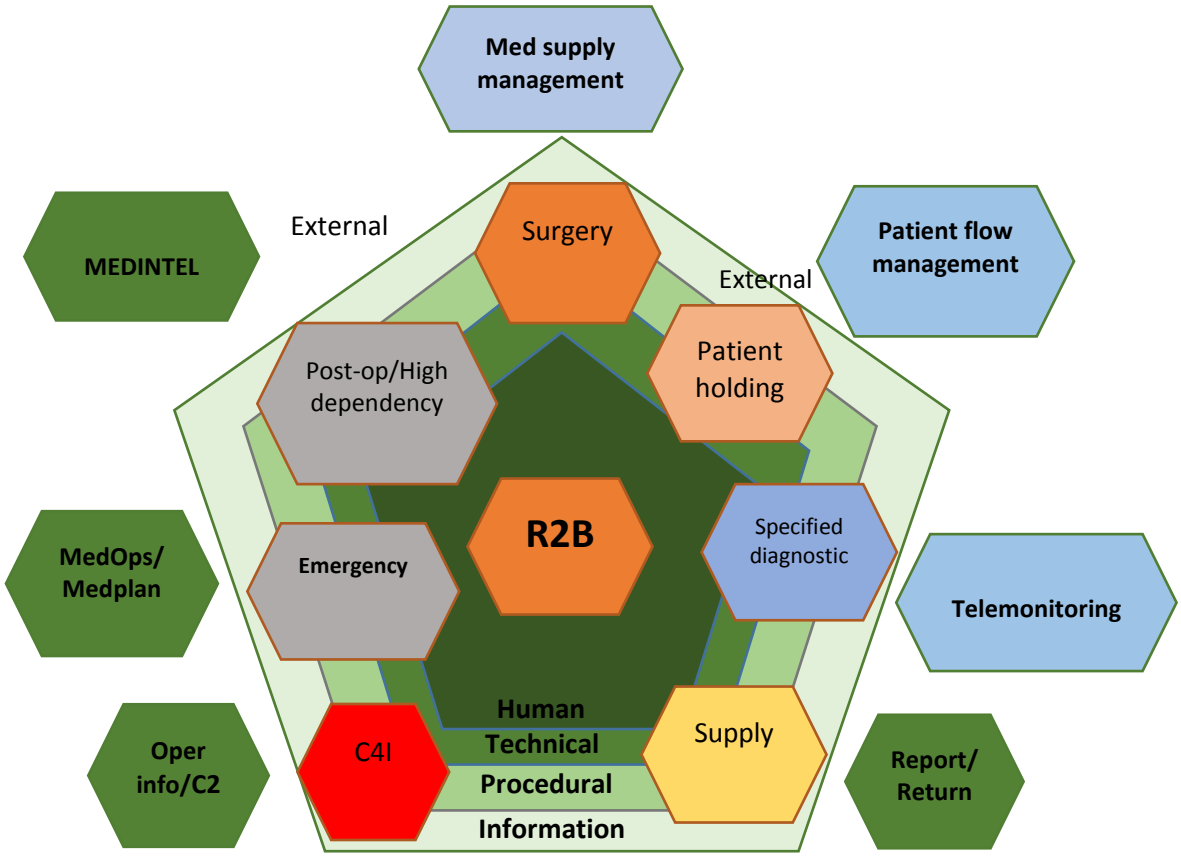

Figure 6 Information as one of the dimension of capability

The strategic goal of an M3TF involves ensuring interoperability from the moment when military operations start. This commitment will be realized through dedicated communication networks, must support respecting the chain of command and is be able to respond to the commander's battle rhythm during each phase of an operation.

Achieving the goal requires that information ensures interoperability at all levels (ROLE 1, 2, 3, 4) and across all dimensions: human, procedural and technical. The foundation for this level of collaboration can only be provided if sufficient information sharing arrangements have been agreed to by all relevant contributors**.**

Having established the scope of the information dimension through a review of available literature, standards, and other sources these findings will be applied to the different phases of the deployment cycle. Despite the importance of the information domains, due to its cross-cutting functions the individual aspects are incorporated into checklist of all three dimensions.

PART II

1. CHAPTER - PREDEPLOYMENT PHASE

1.1. Predeployment introduction

For the purpose of the handbook, the predeployment phase begins when the commander receives the 1st order and the planning process has started. The predeployment phase continues until the start of physical deployment - the relocation of forces from a national location to an assigned area of operations. The operation depends on cooperation, coordination, effective planning and liaison to achieve the objective through most effective use of resources.
Considering all dimension requirements for the development of an M3TF, it is necessary to begin with a set of assumptions. This is required to separate planning activity that would be undertaken as part of the overall operational planning process (albeit with some medical input) and planning undertaken by medical planners at the tactical level to ensure the safe and effective deployment of an M3TF.

These assumptions are:

a) The M3TF is being generated for a planned/established operation rather than a contingent capability.
b) The medical/operational estimate has been undertaken and has established:
    - the requirements for an M3TF,
    - the level/role of care that is to be provided,
    - the modules required to deliver the capability, and
    - the anticipated duration of requirements.
c) The command and control architecture has been established and that TCNs/providers have agreed to transfer authority of command/control of their personnel.
d) TCNs/providers (and their module contributions) may or may not be identified at the start of the medical planning process.

These assumptions, which are common to all phases, provide a baseline for medical planning activities (within the scope of MMA-Emp) to be undertaken, accepting that some procedural work will need to be completed beforehand (as part of the operational planning process and so out of scope for MMA-Emp). The mission requirements define the scope, duration, and scale of deployment operations.

1.2. Human dimension

Setting up a multinational mission referring to the human dimension, the M3TF Commander has to gain and consider a huge variety of information of whom he will be working with. The commander has to consider the aspects of human interoperability within the facility. The first step would be to identify the different nationalities that will be represented in the facility as well as in the medical environment during the deployment. The national identity, the cultural background, the languages, the national or local habits, will all be of influence during the second step that would be the consideration of the identified groups of these human aspects.

To describe the identified human factors, five groups are described in Part 1, Chapter 1, being:

- Qualification and language.
- Leadership and command.

- Training and mutual trust.
- Culture, ethics and religion.
- Health and nutrition.

Qualification and Language (H1)

The variety of national medical education levels and their content have to be evaluated before going to the mission and common standards have to be set on an overall agreement. It is highly important that all participants agree to the standards for fast and effective work.

The next factor to be considered, are the possible differences between qualification levels of personnel in the same function. For instance, do OR-nurses from the different countries have the same type of qualifications? Overlaps, as well as gaps, between the qualifications of personnel within the facility need to be assessed and risks resulting from this need to be mitigated.

Credentialing for specific specialisation can be different in participating countries. Based on legal aspects within the respective countries, personnel can be allowed to perform different type of activities within their profession. Differences should be made aware, gaps identified and risks mitigated.

One of the first aspects of qualification and language in this group to consider is differences in use of medication. Between countries there are differences in the use of medication. Differences to be considered are the strengths of different types of medicine, the amounts of medicine a physician will prescribe, the differences in type of medicine prescribed for the same diagnosis, the duration of a prescription or who is allowed to prescribe and hand out certain type of medicine.

In most multinational missions, English will be the common language however this might differ in specific mission areas. It is important to be clear on the mandatory language skills (**H1.2**) for the mission. For personnel it should be clear at what level they must be able to speak/read/understand the language, especially for the professional use.

Based on differences between the countries, it needs to be considered, whether personnel are trained in a different system of patient treatment. Protocols might be different which can lead to gaps during the treatment leading to risks of patient safety. These differences must be identified in the pre-deployment phase and measurements have to mitigate possible risks.

Leadership and Command (H2)

In the predeployment phase the commander needs to identify possible differences of described roles and problems that might occur. In the respective national medical facilities a set of standardized roles for the M3TF needs to be created and approved by participating nations, in such a way, that personnel from all nations are able to accept and fit in.

Responsibilities during predeployment phase should be divided into national responsibilities, lead nation responsibilities and individual responsibilities. After Transfer of Authority (ToA), in principle the responsibilities are for the lead nation to assign. The lead nation must set the required set of standards for personnel in an early phase (for instance level 1 preparation, vaccination, physical and dental fitness, hygiene awareness, first aid and weapon

qualification...etc.). It is national responsibility to achieve required standards before ToA. Mutual understanding of the responsibilities is crucial for successful collaboration.

Personnel from different nations/providers might be familiar with one leadership style rather than another. Leadership in national military or medical organizations can be based on very hierarchical systems on the one hand, versus very flat organization on the other hand. The perception of ranks and differences in cooperation between ranks can be quite different between nations. Leadership within an M3TF must take the differences into account, awareness is the key. Differences can be overcome by mutual training or teambuilding.

During the predeployment phase it might be difficult to have direct access to all personnel that will be part of the M3TF during the mission. Having a liaison for a group of personnel within a specific country can be a consideration for structuring communication in this phase.

Consideration should be given to communication both verbal and nonverbal. Language and tone should be considered when communicating with those from other cultures and backgrounds in order to maintain good understanding and team cohesion.

The first team meeting with all international crew members is a sensitive moment that can be fundamental for the rest of the mission. Based on the commander´s initial interaction with the personnel, the team building process can be accelerated, delayed or inhibited.
Show yourself as the leader, open, willing to talk and also explain things, answering questions and willing to participate in solving problems if they occur. Explain how you intend to lead the team. It is essential to know whom you are working with, what their strengths and what their weaknesses are, what they fear and what they are happy with. Do not lose the personal contact in the team, always motivate, be thankful and do not criticize in a very harsh way. Be strong enough to excuse yourself if you make a mistake. This does not weaken your position. Lead as you like to be led. Do not play a role. Be yourself.

Training and Mutual Trust (H3)

By deploying personnel from different countries in one M3TF, it is realistic to assume the procedures personnel are trained to work with will be different. These differences can lead to misunderstanding, miscommunication, lack of mutual trust, and other risks of mistakes within the facility. Team training creates mutual understanding of the M3TF procedures. This is highly advisable and will create a higher level of trust and understanding.

There can be differences in used or accepted medical standards between several participating countries. These differences might occur for different reasons like training level, national care structures or national regulations. For multinational collaboration the differences in standards must be determined in the predeployment phase and if possible a mutual standard should be made.

For any type of cooperation or collaboration, mutual trust is an essential factor based on acceptance of possible differences in training, habits, culture, and of accepting each other’s competencies. Without trust, any multinational modular approach will lead to failure.
Trust can be gained by mutual training, getting to know and understand each other’s competencies. The commanding personnel should be aware of any lack of trust between groups of personnel, possible expectations groups of personnel might have towards others, or possible experiences based on earlier cooperation.

Culture, Ethics and Religion (H4)

It is necessary to identify differences between the nations taking part in your mission team. Based on national or cultural background there can be cultural treatment differences. After assessing the possible differences, comparable and common standards must be made. Differences can be for example, in war surgery, where some nations or cultures tend to amputate a severe lower leg injury rather than spending hours and hours to save as much of the leg as surgeons with another background would tend to do. Differences might also occur in rehabilitation or pain treatment, for example the use of painkillers versus acupuncture. These differences should be taken into account as well, both from point of view of the medical personnel and that of the patients.

Based on experiences in multinational environments, cultural norms and prejudice, there can be mental reservations against being treated by medical personnel from a particular participating country. If these prejudices exist, it is advised to find out how and where they originate from and whether experiences are based on some provable facts or examples. While setting up a team a commander should spend some time talking to the personnel after presenting all the nations to find out how the personnel thinks, if are there any prejudices in working together with other people or nations. Take some time to discuss and try to minimize fear, uncertainty or prejudices that might appear.

In any team there are risks for issues in gender acceptance. In a mixed team, based on diversity and multinationality these risks are even higher. There can be problems of gender acceptance, with female officers or NCOs in leadership roles. All other kinds of diversity can lead to lack of acceptance like homo-, bisexuality or transgender background. Cultural or religious background can be a cause of the differences in acceptance. Possible lack of acceptance can include colleagues as well as patients. Commanders should be prepared for argumentation and discussion if this situation occurs and find a convincing solution to ease situations that might happen.

When creating a multinational and diverse M3TF to work according to the principles of the MMA, personnel may have a certain amount of bias. The bias can include other´s and one´s own way of working, other level of professional standards, or other issues. Most important for the commander is to find out whether the bias will influence cooperation. If so, is this a risk and how should the risk be mitigated? It should be assured, that the level of professional standards of the medical outcome, are similar. If possible, try to draw the whole team together before going on the mission. If not, assemble the team as early as possible and discuss possible differences or problems.

Health and Nutrition (H5)

Every nation or culture has its own typical nutrition standards. Differences might be related to the way food is prepared (fried/cooked/boiled, spiced or not), to the amount of food the average person consumes a day (number of calories), to the type of meal people consider as a standard for eating at a certain time of day (hot food, cold food for breakfast, lunch or dinner), or some types of food that might be forbidden in some nations/cultures/religions or for medical reasons. In the predeployment phase all differences should be defined to ensure food provision can cover all needs.

Besides the common nutrition standards in countries, regions or cultures, there might also be differences in nutritional habits. The moment of the day of consuming lunch or dinner can be

very different (lunch and dinner in southern Europe starts approximately two hours later then in northern Europe) as well as the time consuming lunch or dinner will take. The habit of drinking alcohol will be different between groups of personnel in a multinational environment. While alcohol is completely forbidden for some, others will have an accepted habit of drinking wine at lunch. Even the type of coffee (espresso versus filter brewed) can be different and be of influence of working atmosphere.

For preparation of food there might be differences in national regulations for hygiene standards. Some countries might have (preventive medicine) personnel being responsible for inspections of the system based on their national regulations. Regulations might cover kitchen hygiene, water purification systems, minimum required number of toilet/shower per person, allowed number of persons in a sleeping facility, etc.

Working in a multinational environment might also cause differences in hygiene perception. Where regulations do not prescribe minimum hygiene standards, personal perception will set the standard. It is advisable to be aware of the possible differences between those perceptions, based on part of the world personnel origins and the situation they are used to in their home country.

Environmental Standard (H6)

The implementation of environmental aspects, relative to infrastructure planning (building the M3TF), must be taken into account throughout all stages of an operation. Whenever possible, it is optimal to conduct an environmental evaluation in order to identify any known environmental issues (e.g. contamination, hazards, and environmentally sensitive sites).

1.3. Procedural dimension

This section will separate procedural considerations by where in the predeployment cycle they are relevant to, not where they should be addressed in the planning process. All procedural arrangements should be considered in the predeployment phase where the time and space for development exists.
In the predeployment phase the following procedural activity should be undertaken:

- M3TF Commander validation of the MLN (Medical Lead Nation) assessments and plans,
- Undertake a capability review as part of C2 architecture identification, population and communication to TCNs/providers,
- Identify where cross-department (module) and whole-M3TF activity is undertaken and generate standardized operating procedures to manage these,
- Establish the governance and assurance architecture/plan, and
- Prepare to support higher echelons with informational procedures.

M3TF Commander Assessment and Plan (P1)

The M3TF Commander is responsible for adhering to and supporting key assessments and plans made at the MLN level. In the predeployment phase these include coordination of Health Service Support (HSS) and Force Health Protection (FHP) initiatives, applicable considerations for HSS and FHP planning and operations and assessment of medical leadership with applicable medical advisors. M3TF Commander´s validation of these key assessments and plans permits for initial alignment of the M3TF's capabilities with that of the MLN leadership.

Capability Review (P2)

The capability requirements of different MTF, and in some parts, the overall medical system, are recorded in multiple documents and standards. One set of capability requirements sub-divide and describe e.g. in NATO AJP4.10(C), Comprehensive Health and Medical Concept for EU-led Crisis Management Missions and Operations or United Nations Medical Support Manual.

The overall capability of an M3TF is based on the capabilities of its functioning parts and working processes and not by its capacity. In order to plan and verify the capabilities multiple review tools have been developed[11].

Intermodularity and SOPs (P3)

Modules´ SOPs need to be available for every module. These need to include all prerequisites and caveats, which might have impact on connectivity to other modules. The intra-modular processes should be reviewed as early as possible. There are readily usable tools (some editing may be required for military use), that can be used both for the whole medical facility and single modules. As an example, NATO AMedP-1.6 provides guidance for development of such a (military specific) tool, if necessary.

Intermodular Review (P4)

The main issue/area of risk with medical care provision within an M3TF lies with the interaction between separate modules. For example, the core processes of surgical care provision cannot be sustained within one (surgical) module, but overlaps nearly always with other modules such as intensive care units and wards. Logistical and pharmaceutical processes are other examples of separate supporting processes. There is wide overlap between medical processes and technical and human dimension and processes; as such, these cannot be separated in practical approach.
In order to prepare M3TF-level SOPs, the modules´ SOPs need to be reviewed and the transitions between modular processes considered and tested. Any possible inconsistencies need to be identified, mitigated and, ideally, resolved.

In the predeployment phase, it is required that all intra-modular SOPs and patient safety procedures are given to all TCNs to review. In order to validate the inter-modular processes a clinical walk-through, Table Top Experiment (TTX), and during the integration phase, a live exercise (LIVEX) is advisable.

Pan-M3TF SOPs (P5)

M3TF-level SOPs are essential to ensuring optimal modular interoperability. Through review and collaboration with TCN Modules' Senior Medical Officers, the M3TF Commander must identify and resolve any and all procedural capabilities and conflicts. Module SOPs should be written from the end users perspective and be standardized.[12] At a minimum, module SOPs must be assessed for interoperability gaps. When conditions permit, the M3TF Commander and TCN Modules' Senior Medical Officers should ensure the proper completion of a patient case-

[11] e.g. AMedP-1.6 Medical Evaluation Manual, U.K. Care Quality Commission manual
[12] To include: header, purpose, scope, references and related documents, definitions, roles and responsibilities, procedures (major steps, individual action steps within each major step and clarifying notes), appendices, revision history and approval signatures (https://www.thefdagroup.com/blog/a-basic-guide-to-writing-effective-standard-operating-procedures-sops).

based process TTX and evaluation, testing the interoperability of existing module SOPs. The resultant interoperable M3TF-level SOPs must clearly detail each module's processes as well as the transitions of patient care and movement between modules. Attentiveness to the effectiveness of each SOPs is crucial. Lessons learned will dictate the SOPs' modifications in the Deployment and Redeployment Phases.

Governance and Assurance (P6)

It is accepted that by combining modules from different TCNs/providers (which includes personnel, equipment, consumables and practice guidelines) builds risk into a medical system whose overriding priority is to eliminate it. Therefore, the requirement to ensure that care delivered by an M3TF is safe and effective demands that a comprehensive clinical governance framework is established, and a robust assurance process employed.
Different assurance frameworks are available, military and civilian, national and international, any of which could be adapted for use within a modular medical M3TF. Examples include: the U.K. Care Quality Commission's five key questions of all inspected services and the U.S. Center for Biotechnology Information's areas of consideration.

The U.K. Care Quality Commission's five key questions of all inspected services:	**The U.S. Center for Biotechnology Information's areas of consideration:**
a. Are they safe?	Alert Fatigue, Health Personnel
	Benchmarking
	Clinical Audit
b. Are they effective?	Credentialing
	Facility Regulation and Control
	Guidelines as Topic
c. Are they caring?	Near Miss, Healthcare
	Potentially Inappropriate Medication List
d. Are they responsive to people's needs?	Professional Review Organizations
	Professional Staff Committees
	Public Reporting of Healthcare Data
e. Are they well-led?	Time Out, Healthcare
	Total Quality Management
	Utilisation Review

Whereas the choice of tool is a decision made by the MLN, it is essential that whatever healthcare governance framework put in place is robust, and able to answer the fundamental question, 'Is care delivered within the M3TF safe and effective?' The assurance of medical force protection and the patient care pathway, from admission to discharge, is required, not only to satisfy the operational commander, but also the TCNs/providers who will expect care to be delivered in a way consistent with that from their own single-nation M3TF.

Informational Procedures (P7)

Framing of medical communications systems and intelligence is undertaken at the MLN level, however the M3TF Commander must ensure the M3TF is prepared to support the following:

- Collection of medical lessons learned data that provides operational documentation and results for change to current plans and policy,

- Establishment of a health surveillance capability to monitor disease and environmental hazards,
- Receiving of products associated with the joint intelligence preparation of the operational environment (JIPOE),
- Maintenance of situational awareness through coordination of medical information with (where applicable) the medical leadership, Senior Medical Officer, multinational units, and other agency medical support personnel,
- Coordination of medical consultation services for the MLN, to include telemedicine (where applicable),
- Optimisation of communications equipment compatibility, standardization of radio frequencies, reports formats, treatment protocols, and requirements for equipment with TCN modules,
- Utilisation of a standardized operational and medical terminology reference guide to facilitate the synchronization of health support efforts and minimize misinterpretation between TCN modules,
- Establishment and maintenance of medical records of M3TF patients, and
- Collection and forwarding of medical statistical data pertinent to the Theatre of Operations.

The predeployment phase allows for M3TF Commanders to best shape their organization's processes and anticipated deployment phase activities. As with all military operations, lessons learned from previous operations should be considered. The caveats to that practice are the shared understandings that no one health care organization has all of the best processes and that potentially short pre-deployment phases will most likely see further refinement early on in the deployment phase.

1.4. Technical dimension

All essential requirements and other requirements set out by nations must be applied including any reference to "minimizing" or "reducing" risks. It is necessary to take into account the technology and best practice existing at the time of M3TF design, including the economic considerations compatible with a need of a high level of protection of health and safety.
Technical dimension issues may be affected by already existing national laws and multinational standards and regulations (i.e. NATO, EU, and UN), policy, doctrine and directives, SOPs, SOIs as well as by missing common terminology.
Technical specifications, caveats, and restrictions of all modules must be provided in a standardized format to the coordinating authority. Where technical equipment and CIS components cannot be connected or integrated, the integrating asset, treatment facility or medical unit should provide the respective functionality to the integrated modules.

Medical Materiel and Supplies (T1)

Medical materiel used in an M3TF must provide patients, users and third parties with a high level of protection and also attain the performance levels attributed to them by the manufacturer. Medical materiel must meet requirements to ensure that all items are safe and perform as intended.

Days of Supply (DoS) must be considered in order to provide reliable support to an M3TF and to cope with any potential supply chain distraction which can occur and cause significant delay in the processing of goods. Those factors like customs clearance (causing potential delay) or physical transport (size, weight, etc.) must be considered.

Pharmaceuticals, consumables, non-consumables should be labelled in accordance with (IAW) their Marketing Authorisation (MA). Special attention must be paid to processing of blood and blood products, and medical gases. Storage capacity and specific requirements are to be identified. Expiry dates of all items must be visible and regularly checked.

The compatibility and interchangeability of stretchers will secure the ability to attain the movement of patients. Standardized stretchers are required to minimize patient or casualty reloading[13].

Medical Equipment (T2)

The exchangeability of medical equipment must be considered from the beginning. The results must ensure that the developed M3TF is fully interoperable with all the equipment used.
Whenever it is possible, user manuals in English or other agreed language should be provided for all equipment electronically and/or in printing. Life supporting devices must be capable of operating independently from the central power system with batteries and electrical connector(s) in order to cope with any interruption of the power supply.

Medical equipment used in an M3TF must provide patients, users and third parties with a high level of protection and also attain the performance levels attributed to them by the manufacturer. Medical equipment must meet legal requirements to ensure they are safe and perform as intended. Equipment which requires regular checks provided by authorised technicians must have valid certificates ensuring its safety, accuracy and reliability. Their expiry dates must be monitored.

Maintenance and ability to repair possible damages and/or breakdowns by authorised technicians equipped with appropriate spare parts must be considered, including taking into account the required storage capacity and/or supply chain.

The lifecycle management of medical equipment in regard to the planned duration of the deployment must be considered. The equipment which is close to the end of its lifecycle should not be deployed.

Infrastructure (T3)

Infrastructure planning must follow the phases of the operations planning process and be balanced amongst a variety of demanding military factors in order to achieve operational sustainability. Suitable planning for infrastructure/place of deployment is of importance in order to provide protection and quality of life conditions to its own forces and the whole M3TF, while minimizing life cycle costs and the impact on the local population and environment. Infrastructure planning must meet the operational requirements.

Assembly of standard functional tents and/or containers must ensure that all possible differences i.e. height of floors, size of connections, etc. will be mitigated. Especially passages and connections between containers and tents must ensure ease of movement within M3TF. Where it is necessary, appropriate adapters are to be used.

[13] STANAG 2040 Stretchers, Bearing Brackets and Attachment Supports

The projected water network must be able to provide a reliable, sufficient and sustainable water supply in the required quality and safety[14]. Water connections must prevent leakage and contamination. The water capacity must meet M3TF requirements. The quality of water must be in line with the agreed standards.[15]

The electricity grid must be able to provide a reliable, sufficient and sustainable electricity supply in the required quantity and safety. The total projected consumption of the M3TF´s electrical appliances must be identified in advance in order to ensure that the overall generating electric power supply will be sufficient. The requirements for power supply (i.e. voltage) preventing damage or malfunction of equipment must be considered. A back-up electricity system for supplying of modules and critical medical equipment in urgent situations must be planned. Outlets for medical devices should be labelled. The outlets should have a visible indication of intended operational conditions in order to show if they are switched on (power on).

The heating, ventilation, and air-conditioning (HVAC) system must be able to provide reliable, sufficient and sustainable working conditions. It should be able to mitigate differences between national modules with the ability to control airflow, temperature, and/or even humidity throughout the M3TF and especially its critical modules.

The Communication and Information System (CIS) including hardware must ensure effective communications and efficient information flow (selected data exchange) within an M3TF and at all hierarchical levels as needed (tactical, operational and strategic). The Information Technology (IT) and communications capabilities must be compatible and interoperable. IT infrastructure must meet information security requirements. All subsystems must provide basic services tailored to the needs of the mission and function. The hardware equipment such as servers, connections, printers, terminal workstations and the equipment that is needed for maintaining the CIS system operational status must be interoperable.

M3TF Information System (T4)

The hospital information system must reflect that the medical records fall under medical confidentiality due to their sensitive nature and are under uniform protection of medical records and personal information. If deployed, the software elements – operating system, databases and applications, the logical storage and the client core and functional applications should be interoperable. The medical records must be held in a secure system ensuring that they will only be seen and used by authorised medical staff. The medical records' functionality should provide secure storage, controlled access, prompt retrieval, and resources to review medical records. The possibility to use officially recognized office tools by M3TF staff must be ensured. In order to mitigate potential language difficulties, a language lexicon should be available.

Telemedicine / Telehealth (T5)

From the beginning of structuring CIS, nations must take into account the telemedicine aspects. Dedicated hardware and software must be identified as well as the increased bandwidth that will be required to support the use of telemedicine capabilities.

[14] AMedP-4.9 Requirements for water potability during field operations and in emergency situation
[15] AMedP-4.9 Requirements for water potability during field operations and in emergency situation

Waste Management (T6)

An appropriate waste management plan and system must be built in a way that does not have a negative impact on the environment nor human health. Waste management is the collection, transport, treatment, or disposal of waste materiel with the aim to ensure a healthy and sanitary environment. The whole process of dealing with sewage, waste disposal (storage, bags, and boxes) and cleaning services must be defined, and the respective responsibilities assigned to the nations. Special focus must be put on disposal of hazardous waste within an M3TF. A deployable waste incinerator should be considered.

Storage Capability and Capacity and Sustainment (T7)

The necessary storage capabilities and capacities for pharmaceuticals, medical gases, blood and blood products, consumables, and medical equipment and devices are identified and ensured. They must meet legal requirements and be in line with the labelling specifications of the manufacturer. Requirements for specific storage conditions (e.g. controlled drugs) must be identified and allowing their monitoring and recording. The Good Distribution Practice (GDP) must be followed, such as i.e. temperature and humidity control, etc. The storage, handling, and disposal of all pharmaceuticals, medical products, blood and blood products must be defined.

Transportability/Manoeuvrability (T8)

The M3TF must allow at any time to be disassembled, transported and re-assembled. The following facts must be provided: what transport means are necessary to move the modules, what time and manpower is required to assemble and disassemble the modules, what special equipment and precautions are to be taken into consideration (i.e. fragility of CT module, etc.).

2. CHAPTER - DEPLOYMENT PHASE

2.1. Deployment introduction

The ability to rapidly deploy robust and mobile military forces for the full range of the operations and missions where and when required by the nations pose challenges on medical services of TCNs/providers. The medical services must be able to sustain such forces for prolonged operations, at strategic distance and in austere environments.
The availability of a mission ready M3TF and an ability to deliver them at the right time, to the right place and in the right order is essential. This in turn requires structures, systems and procedures for the effective deployment of an M3TF.

The capability to deploy an M3TF rapidly to the Theatre of Operation and subsequently integrate the M3TF into the joint force as directed by the operational commander is critical. Deployment planning is an integral element of the operations planning process (OPP) and should be conducted from the outset of an operation. The mission requirements define the scope, duration, and scale of deployment operations. Deployment must be focused towards clearly defined and commonly understood objectives among the M3TF's contributors.

2.2. Human dimension

The deployment phase is, from human dimension point of view, the phase in which the personnel from all participating nations will actually be working and living together. It is the phase in which all the efforts of preparing for a successful collaboration, needs to result in a flawless execution. In the perfect world all the possible misunderstandings based on differences in language, culture, standards, regulations or habits are recognized and controlled by intensive mutual preparation. In reality however, a successful multinational modular collaboration within an M3TF will still need focus and attention for each identified group of human factors.

Qualification and Language (H1)

Although the working population of the M3TF are all qualified speakers in the agreed common language, there will be groups of individuals sharing a common national language of their own. It is very common as a part of human nature; people will switch to their national language within their groups. This could be a reason for individuals to be excluded from conversations. It is up to all personnel to maintain the social standard of using the agreed common language in groups. It is up to the command to make sure there is a discipline to use the agreed common language in any professional situation.
During predeployment all the differences in qualifications, use of medication, individual regulations of work, and other procedural differences have been identified. In the perfect situation the command has come to a common set of standards and operating procedures. However, the proof of the pudding is in the eating. During the deployment phase, the agreed standards, protocols and procedures have to be evaluated continuously and adapted if necessary. Standards set in the predeployment phase must be shared as early as possible with all participating nations on mission. During facility setup, leaders should evaluate if standards are matched by all team members with short meetings every evening. These meetings are the foundation to become a team. Use team building measures.

Leadership and Command (H2)

During the deployment of an M3TF, the challenge in leadership will be based on the diversity within the facility. Leadership will need to continuously balance between leadership styles, being the glue keeping the system together and in the same time being the oil necessary for keeping the motor running smoothly.
The predeployment phase gave the leadership time to get familiar with the different needs for leadership and/or commanding styles. The deployment phase will challenge the senior leaders to act as needed. The leadership within a team of multinational and multicultural personnel needs to be as similar for everybody as possible, but as different as necessary. For that matter, a situational or adaptive leadership style would be required.
Because of the multinational character of an M3TF the senior leaders will have to make sure all different national regulations are respected. To be able to do so, the senior leaders need to work in close coordination with all participating nations, if necessary via liaison officers (LNOs).

Training and Mutual trust (H3)

During the deployment phase, training must be an ongoing process. Particularly, events which are not part of a daily routine need training to ensure all personnel are familiar with the procedures and protocols. These include (but are not limited to) MASCAL situations, CBRN events, and contagious patients. A training routine will preserve or even increase the mutual trust that has been created during the predeployment phase. Training effort can be focused on protocols and procedures within the module (intra modular), the compatibility of the procedures between the modules (inter modular) and the exchangeability of personnel or parts of modules (cross modular).
In a multinational environment the differences in national regulations can cause differences in deployment regulations. Personnel might be deployed for different periods of time resulting in individuals or groups of personnel rotating in or out during the deployment. Teams within the modules, or the complete teams manning the modules, will be changing continuously during the deployment. Training is necessary to maintain the desired standard of cooperation and mutual trust.

Culture, Ethics and Religion (H4)

During the predeployment phase, differences based on national/personal ethical backgrounds as well as culture or religions should be assessed. Common standards, procedures and protocols can be established. Gender-based values or issues should be discussed and resolved. National, cultural and religious differences must be respected throughout the deployment.
Successful cooperation is based on clear mutual agreed and accepted procedures and standards, as well as on mutual respect and acceptance. It is the important role for leadership to make sure all personnel are able to live according to their own cultural or religious regulations, and on the other hand work according to the common and agreed standards. It is an important role for everyone on the team, and for the M3TF Commander to ensure and to stimulate; to live and work with mutual respect for each other and each other's background.
It is very important for leadership, to supervise the situation from the beginning. At the start of the mission, the M3TF Commander and their deputy should conduct several informal meetings, even icebreakers, familiarizing mission members mutually. Talking points in the introduction of all team members might be as follows:

- Who am I (social/professional CV, volunteered or sent by order, family background)

- What kind of specific medical education do they have (specialist what special skills and experience)
- Are there any religious accommodations needed?
- Motivation, expectations and fears going in the mission
- Food/special diet needed?
- Physical/mental health potential limitations (This point should be discussed under private circumstance not in the group)

Be aware of your team members´ religious practices, motivation, nutrition, actual stress or injuries that could influence work performance. In this phase talk to all team members under private circumstance and gain your own impression of all persons in the team.

Health and Nutrition (H5)

A thorough assessment of nutrition standards and habits in predeployment phase will lead to a nutrition system in which the specific needs for all individuals can be met (e.g. special food related to kosher aspects, gluten free, etc.). During deployment phase this might take a complex logistic chain for sustainment of the system. Because of possible differences in nutrition needs or habits, it is desired to have as flexible a system as possible. If this is not possible explain why not and try to solve problems or at least minimize them.

Because of the possible differences in hygiene standards, the set standard during deployment must be as high as possible[16]. A lower standard of hygiene will not be acceptable for those who are used to high standards. The standard for food and water safety and defence, kitchen operation, sanitation, lodging accommodation, and so on should be acceptable by all TCN. The leadership must be clear on the standards and have a system to check and guarantee the standards.

For the leadership it is necessary to stay in close contact with personnel to make sure no groups are forgotten in the system, preventing dissatisfaction and unrest.

2.3. Procedural dimension

This section will identify key procedural health care activities commonly executed during the deployment phase of multinational operations. In the deployment phase the following procedural activity should be undertaken:

- Mass Casualty Situations (MASCAL) (P1.1 - P1.4).
- Patient Movement (P2.1 – P2.4).
- Health Care Records Management (P3.1 – P3.5).

Mass Casualty Situations (P1)

Procedures for handling mass casualty situations must be established. Particular emphasis is placed on the flexibility of medical units to respond to sudden changes in the casualty situation. Successful management of a MASCAL is a complex task where success relies as much on well-practiced logistics and communications as it does on skilled medical treatment. The MLN Chief Physician and M3TF Commander must ensure the effective triage, communications, transportation, and emergency management, Patient Movement (PM), and MEDLOG management aspects of the mass casualty plan are thoroughly rehearsed. Additionally, the

[16] AMedP-8.15 Casualty Care and Basic Hygiene for all military personnel

MLN Chief Physician and M3TF Commanders must ensure psychological support is provided and present to support affected patients as well as staff members both during and after the situation.

Patient Movement (P2)

The theatre Patient Movement (PM) policy, known in some nations as a holding policy, is the key to balancing the treatment capability available at each level of care against the required medical PM assets. The provision of resources will be coordinated by the operation/mission planning staff but will be comprised of assets from a number of sources, including HN support. Theatre medical PM requires careful planning and an acquisition and cross-servicing agreement. Typically, PM from point of injury to Role 1 is each nation's responsibility. PM from Role 1 to Roles 2, 3 and/or 4 is a shared responsibility. Standing agreements may already cover support arrangements between TCNs. Establishing the PM policy is a command decision of each nation. Medical and logistic staffs will advise. The MLN Chief Physician will provide recommendations and monitor the established patient policy as executed by M3TF Commanders.

TCNs bear ultimate responsibility for ensuring the provision of health care to their forces allocated to multinational operations. This may be discharged in a number of ways, including agreements with other nations or the appropriate multinational planning staffs. The operational commander is responsible for intra-theatre PM. This may include the movement of MNFs, neutrals, and even detainees. M3TF Commanders must pay close attention to medical obligations for detainees and dislocated civilians, dictated under international law.

It is critical that the M3TF Commander supports effective PM during multinational operations through closely coordinated and mutually supportive efforts of their personnel, carefully balancing mission requirements while contributing to the total theatre PM effort. PM Communications System Support, crosses the Procedural, Technical and Information Dimensions. A responsive communications system is essential to the conduct of PM. The operational commander should establish a system that

- Integrates the available capabilities of the PM system.
- Synchronizes its application.
- Prepares to employ air, land, and sea forces to achieve PM objectives.
- Supports the operational requirements of medical information management as it relates to patient accounting and reporting, medical regulating, and patient in-transit visibility.

National evacuation systems (e.g. U.S. TRANSCOM Regulating and Command & Control Evacuation System) for managing tactical aeromedical evacuation (TACEVAC) must be visible to the operational command, either by providing liaison officers or by providing national electronic information systems and login details to appropriate personnel within the operational headquarters. This ensures that bed management, patient regulation and transfer from airfield to M3TF are properly coordinated. M3TF Commanders must use directed available evacuation systems for PM monitoring, forecasting, and planning in support of fixed and deployable operations. Use of such evacuation systems enables:

- In-transit visibility.
- Transport to bed solutions.
- Planning, coordination, allocation.
- Data analysis.
- Decision support.

- Patient safety module.
- The ability to extract/analyse PM data.

Evacuation systems must meet patient medical treatment needs by matching medical treatment capabilities and beds to available transport and maintains historical information and in-transit visibility on all patients moved in the PM system.

Health Record Management (P3)

The term 'health record' is used to describe the collective and systematic documentation of a single patient's medical history and care. Constituent parts of a patient's health record may be written, physical (X-ray films, scans, laboratory test results etc.) or digital (such as an integrated electronic health record (iEHR)). In practice, the record is likely to be a combination of all of these mediums. Within an M3TF the "lead" nation has responsibility to ensure that an effective health record management system is put in place, which satisfies the legal requirements of their, and other TCNs/providers, legal requirements.
Ideally M3TF medical staff will be able to access a patient's military health record and past medical history, either by enabled CIS compatibility with contributing nation's electronic health record systems, or by the use of paper medical history summaries carried by individual personnel. This will ensure continuity of care as well as a degree of tailoring treatments more to an individual's need.
On admission to an M3TF a patient should be given a unique identifying (hospital) number. This should be used consistently throughout the patient's treatment within the facility (both before and after their identity/service numbers are known). On discharge the M3TF hospital number and record must be reconciled with the individual's military health record. The choice of which medical forms to use will be the responsibility of the medical commander, in consultation with the TCNs/providers.
Whatever format the health record within an M3TF takes, it is important that their completion follows a set of well-defined guidelines to ensure its integrity in providing an unambiguous account of a patient's treatment which can immediately, or at a later date, be incorporated into their own medical health record. These are:

- **Contemporaneous.** Health records should be completed as soon as possible, while events are still fresh in the mind and to inform subsequent treatments.
- **Clear and legible.** The M3TF will have an identified language (usually English). Medical personnel hand-writing notes are to ensure that they can be read afterwards by others and that correct spelling/abbreviations are used.
- **Correct.** It is important that unique identification numbers are used consistently and throughout a patient's treatment to ensure that records are correctly ascribed to the correct patient. This is especially important if there are "common" surnames within the population of TCNs/providers, or where their spelling is different to that experienced by other nation staffs**.**

On Discharge, the patient's health record remains the responsibility of the M3TF lead nation; to keep accessible in case of subsequent re-admission and ultimately to store and archive. Each nation will have its own legal requirement directing how long a health record should be kept. The M3TF lead should ensure that each contributing nation's legal position is known and adhered to. It is also the LN responsibility to provide a list of health records held which relate to other nation's personnel, including how these can be accessed.

Each patient should also be provided with (ideally) a copy of their health record relating to admission to an M3TF, either in electronic or paper format. If this is not possible, as a minimum, a summary of treatment should be provided. This will include:

- Personal Information. Surname, forenames, service number, rank, nationality, sex, date of birth, service/branch.
- M3TF Information. Name, lead nation, location, contact details of M3TF.
- Medical (clinical) information:
  - Date of admission / discharge.
  - Site of injury / illness, mechanism of injury / illness.
  - Relevant past medical history.
  - Report of physical examination.
  - Report of surgical procedure and findings (if any).
  - Diagnostic and therapeutic orders.
  - Observations made during patient's admission.
  - Reports of actions and findings (Laboratory tests, radiological procedures, surgical procedures etc.).
  - Conclusions, including final diagnosis.
  - Recommendations for further treatment if necessary.
  - Final disposition of the patient (date returned to duty, transferred to another hospital (indicate which hospital) or died).
- Authentication. The health record should be authorised by the medical commander, or their nominated senior clinician, before discharge or transfer to another M3TF. This should include the signature and contact details of the officiating officer and the date recorded.

Patient records must be kept secure and confidentiality maintained. Patient care is indeed the M3TF Commander's primary deployment phase activity. Timely patient movement, effective management of MASCAL situations and accurate documentation in patient health records are essential to optimal in-theatre care and both post-deployment phase patient and operational assessments.

2.4. Technical dimension

The transition from predeployment to deployment phase is critical in assuring the combination of all activities – movement to the theatre; RMSD of the M3TF in connection with the technical dimension. The medical logistics in collaboration with general logistic support must ensure for arriving M3TF that appropriate and systematic actions are taken. Participating TCNs should have confidence that contributing medical modules and infrastructure work in harmony together and provide the required level of medical care. The identification of specific shipping/handling requirements up to full integration of a whole M3TF must ensure that medical equipment and materiel, infrastructure and facilities will be properly managed throughout the supply chain. Thus, loss or damage of medicines or medical equipment carries inherent risk to operational capability. The division of responsibility for M3TF supplying among TCNs must be established.

Common Funding (T1)

The common funding agreed by countries can improve the supply of an M3TF and easing the reimbursement between the participating nations. It can also strengthen the required level of supply chain, helping to facilitate smooth, timely, responsive, and effective deployment and force sustainment.

Medical Materiel and Supplies (T2)

Establish a medical supply management system, including its storage capacity. These must be able to handle the provided pharmaceuticals, medical consumables, non-consumables and medical gases as well as blood and blood products. The coordination and distribution must be under supervision of a pharmacist technician or pharmacist. All products throughout the supply chain, including the shipping and transport must apply to the labelled conditions for storage. Cold chain integrity across the supply chain must be controlled, preferably by means of electronic logs that are shipped along with the respective items.

Medical Equipment (T3)

All the equipment and supplies must be maintained to the required level of functionality and serviceability in order to ensure safe and secure work and living environments including expecting performance. A Maintenance Program for all medical equipment and infrastructure in support of the M3TF must be implemented. The exact storage requirements for medical equipment and other materiel must meet the Original Equipment Manufacturers (OEMs) instructions.

Infrastructure (T4)

The combined infrastructure and the whole facility including different medical equipment and supply of M3TF participating nations will require the adequate medical logistics as a key multiplier of success.

Waste Management (T5)

The Deployment site waste management system must be conducted to minimize the harmful effects of waste on human health and the environment. An integrated waste management system includes the management of the entire waste process, including generation, storage, collection, transportation, resource recovery, treatment, and disposal. It must employ several waste control methods based on the waste hierarchy (avoidance, reduction, recycling, reuse, recovery, treatment, and disposal). The effective waste management generated by the force and based on assessment of the mission variables must be properly managed.

M3TF Information System (T6)

The M3TF must establish and maintain adequate communication capabilities that shall be compatible and interoperable to exchange selected data within AOO including a communication plan that clearly describes how the effective communication covers MEDEVAC, units, MEDAD team and any other designated and authorised entities. Lines of communication shall demonstrate that they can keep medical confidentiality while transferring medical data between organising structures (e.g. Patient Evacuation Cell, statistical data).Telemedicine/Telehealth capabilities, including reach-back capabilities should be supported by M3TF information systems.

Storage Capability and Capacity and Sustainment (T7)

Inventory Management for custody and control of any inventory of supplies must be established and utilise proper management principles and processes. The M3TF must properly record and archive records of consumption, materiel purchases and/or stock levels/inventories. Local

provisions could help potentially overcome logistical shortfalls and decrease the amount of equipment and cargo that must be deployed (e.g. transit authority, security, power requirement generation, transportation, and infrastructure). The identified shortcomings could be overcome by bilateral or multilateral support agreements (formal or informal) prior to the deployment of an M3TF to the AOO.

Transportability/Manoeuvrability (T8)

The M3TF must allow at any time to be disassembled, transported and re-assembled. The following facts must be provided: what transport means are necessary to move the modules, what time and manpower is required to assemble and disassemble the modules, what special equipment and precautions are to be taken into consideration (e.g. fragility of the CT module), etc. The movement plan must be developed at the beginning of deployment (i.e. which module will be moved first and so on) in order to ensure early restoration of initial operational capability of the M3TF in the new location.

3. CHAPTER - REDEPLOYMENT PHASE

3.1. Redeployment introduction

Redeployment is the preparation for and movement of forces (units), manpower (individuals) and materiel from an AOO to follow-on designated home bases or any other location. The key to redeployment is that it should not be considered as retrograde movement, but in fact as a new deployment. Redeployment must involve force integrity so that units may be required anywhere, ready to provide the medical care. Redeployment disengages and relocates M3TF from an assigned AOO within the JOA to national locations.
The redeployment planning should be considered at the outset of an operation and continually refined as the operation matures.

3.2. Human dimension

For the human dimension, the redeployment phase will be focusing on activities based on ending human and functional relationships. During a deployment of an M3TF based on Medical Modular Approach, personnel from several modules and/or nationalities have been organized in a temporary structure with temporary functional relations. Examples of activities during the redeployment phase are ending the mission based command relations, returning to home base, resocialisation in home environment, after deployment mental care or support, evaluation for lessons learned.
Redeployment for the human dimension will probably differ among the TCNs/providers within the M3TF, whereas different nations have different rotation-policy. After having stated a fixed redeployment date for the personnel or the facility as a whole, it should be declared to all members of the team. It is essential to not declare only the redeployment date but also key redeployment functions:

- Detailed situation assessment (evaluate information from C2),
- Reduce medical capacity according to information gathered and evaluated,
- Always consider that situations are subject to abrupt change e.g. diseases, incidents, medical support in transition phases etc., and
- Conduct regular personnel interactions.

Qualification and Language (H1)

During the deployment, personnel have been working in a multinational professional environment. Depending on nations´ regulations, the performed work during the deployment could result in registration points for their professional qualification. M3TF Commanders might have to officially declare by certificate, the time and type of work the personnel have been performing. For every nation there might be different regulations or required commander's certificates. It is up to the commander to have the overview of possible requirements and to make sure all personnel receive what they specifically require.
According to supervision and team meetings starting in the deployment phase, the M3TF Commander has frequent contact with all members of the team. When the redeployment date is set, each national representative must formalize what their national after action report must consist of, so the required information can be provided on time.

- Direct the nations´ team representatives to give a detailed review of each person in their (multi)national team concerning medical and personal performances. It should at least give an insight in the elements to sustain and to improve.

- The M3TF Commander is able to compare their own impression with this review, use parts of this review for their own reports and furthermore give feedback on the national review from the perspective of the M3TF as a whole,
- Differences in the reviews should always be discussed with the nations' representatives, and
- If possible, handover all reviews and evaluations personally before departing the AOO.

Leadership and Command (H2)

In the predeployment phase, there will be a ToA from home nations command to the command of the deployed M3TF. In the redeployment phase this transfer will be the reversed transfer. Command will return to the home nation's structure.

It is a part of good leadership to ensure personnel receive performance evaluations. An international evaluation form will be utilised where available. A national evaluation can be made by the national leadership IAW national regulations.
In the redeployment phase the M3TF Commander needs to review and stipulate the objectives identified in the predeployment phase and achieved or not achieved in the deployment phase. The M3TF Commander must also identify differences of described roles, problems and solutions that occurred during the predeployment and deployment phases.

Training and Mutual Trust (H3)

When deploying personnel from different countries in one M3TF, the team training is essential in order to gain mutual understanding and trust. Therefore mutual procedures and medical standards have been coordinated and agreed upon. These mutual standards have been trained accordingly in the predeployment and deployment phases.
During the redeployment phase these mutual standards must be re-evaluated and shared across TCNs/providers, so the information can be referenced in preparation of similar future M3TF deployments.

Culture, Ethics and Religion (H4)

During the predeployment phase the differences based on national/personal medical ethical background, culture or religion were informally assessed. Common standards, procedures, and protocols were set. Ethical or gender based values or issues were discussed and addressed. Although national, cultural and/or religious backgrounds have been identified, differences may still remain.
During the predeployment and deployment phases coping with these cultural, ethical, religion similarities and differences were evaluated. The focus in the redeployment phase will be on the effect of all undertaken measures to cope with these similarities and differences.
Did the personnel of the M3TF feel accepted, respected and appreciated within their organization? Were personnel needs respected throughout the whole deployment? Were the introduction of M3TF-members, (informal) meetings, icebreakers, familiarization efforts, and religious days effective to create mutual trust and understanding so the M3TF functioned as intended? Was the leadership of the M3TF, due to their cultural, ethical and religion awareness, able to manage diversity and promote cohesion?

Health and Nutrition (H5)

In the redeployment phase the leadership of the M3TF must evaluate whether the health and nutrition standards were met during the deployment phase. Were all health and nutrition standards respected and if not, what measures were taken?
For the leadership it is necessary to stay in close contact with their personnel to assure no groups are forgotten in the system, preventing dissatisfaction and unrest to happen. Additional attention in this phase is needed by the leadership of the M3TF to uphold the agreed standards. Personnel who are accustomed to different standards will have to adapt to agreed standards during the mission and will have to make the transfer from these standards back to their national standards upon return. In this phase additional effort from the leadership is needed to maintain and guarantee the high health and hygiene levels until the redeployment has taken place.

3.3. Procedural dimension

This section identifies key procedural health care activities commonly executed during the redeployment phase of multinational operations. In the redeployment phase the following procedural activity should be undertaken:

- Continuation of Theatre Health Surveillance,
- Force Health Protection during RMSD, and
- Medical Logistics Collaboration.

Continuation of Theatre Health Surveillance (P1)

The health surveillance begun in the predeployment phase must continue through the deployment phase, the redeployment phase and beyond. The M3TF Commander must ensure continued adherence to the HSS plans and orders directed by the MLN Chief Physician in order to provide early identification, prevention, neutralisation, minimisation, avoidance or elimination of health threats.

Force Health Protection during RMSD (P2)

FHP measures (beyond theatre health surveillance activities) continue through RSMD planning and execution. The M3TF Commander must be prepared to collaborate with and follow the MLN Chief Physician's plans and orders for potential support of aerial port and sea port debarkation functions. If the M3TF is departing theatre without replacement, the M3TF Commander must continue to support minimum operations during retrograde operations in preparation for departure from theatre. If the M3TF is departing theatre with follow-on replacement, the M3TF Commander must effort synchronized transfer of force health protection capabilities into the operational Commander's force and/or the incoming M3TF.

3.4. Technical dimension

The transition from deployment to redeployment phase is critical in assurance of synchronization of closing operational capability and disassembling of the M3TF. In the technical dimension the redeployment planning is mostly related to the transfer of infrastructure, equipment, and materiel from AOO to home base. Moving the forces with accompanying infrastructure, equipment, and materiel still must ensure keeping the operational status required to execute the mission. The desired end state after redeployment of the M3TF capability is its restored readiness to deploy to future operations which requires the reconstituting and cross-levelling of supplies and equipment.

Medical Materiel and Supplies (T1)

The basic inventory should be conducted in order to identify medical materiel and supplies suitable for redeployment. Medical materiel and supplies should be consumed as much as possible before redeployment in order to reduce the overall logistics footprint. Only medical materiel and supplies with required level of safety and clear history is eligible for redeployment. Obsolete medical materiel and supplies must be disposed IAW a waste management plan. The excessive supply stocks can be redistributed to other allied M3TFs in AOO or granted to local government/authorities in support of national or mission interests and policies.

Medical Equipment (T2)

The inventory must be conducted to identify suitable medical equipment for redeployment in order to reduce the overall logistics footprint. Based on the inventory, a plan for disposal of obsolete and/or unrepairable medical equipment must be developed as well as a plan for maintenance actions in AAO or home base after redeployment. According to the national rules the medical equipment that will not be redeployed can be redistributed to other allied M3TFs in AOO or granted to local government/authorities in support of national or mission interests and policies.
The medical equipment identified for transport should be properly label and prepare for transport (e.g. palletisation and custom preparation).

Infrastructure (T3)

The inventory must be conducted to identify infrastructure for redeployment in order to reduce the overall logistics footprint. Based on the inventory, a plan for disposal of obsolete and/or unrepairable infrastructure must be developed as well as a plan for maintenance actions in the AAO or home base after redeployment. According to the national rules, the infrastructure that will not be redeployed can be redistributed to other allied M3TFs in the AOO or granted to local government/authorities in support of national or mission interests and policies. The redeploying M3TF must ensure that the place of its installation is returned to the initial state.

M3TF Information System (T4)

The LN or FN must ensure that all medical records are archived. The medical confidentiality of all data, their protection against damages as well as their prevention from abuse must be secured. The handover of medical records collected during the mission to the TCNs must be done IAW the TA.

Waste Management (T5)

In connection to the infrastructure liquidation, the site waste management should not be overlooked. The M3TF must follow the waste management plan. The waste management system (collection, transport, treatment, or disposal of waste materials) must be kept until the end of redeployment with the aim to ensure a healthy and sanitary environment. Special focus must be put on disposal of clinical waste within the M3TF. The whole process of dealing with sewage, waste disposal (storage, bags, and boxes) and cleaning services must be defined, and the respective responsibilities assigned to the nations.

Storage Capability and Capacity and Sustainment (T6)

During the redeployment the GDP must be followed, taken into account the transport conditions (e.g. temperature control, humidity control, cold and freezer capabilities, etc.). The storage, handling or disposal of all pharmaceuticals, medical products, blood and blood products throughout the redeployment phase must be defined.

Transportability/Manoeuvrability (T7)

Before the redeployment the timely interaction with the movement control cell is required in order to negotiate the transport requirements (e.g. size, type, loading on pallets, containers, and flat racks etc.). The M3TF must be re-assembled and transported in line with a movement plan reflecting the requirements for packing and loading for movement already identified during the inventory. All infrastructure, medical materiel and supply must be adequately packed for transport in order to be prepared for the custom inspections (if required).
The following facts are required: what transport means are necessary to move the modules, what time and manpower is required to assemble the modules, what special equipment and precautions are to be taken into consideration (e.g. fragility of CT module). As part of preparation for the transport the cleaning, washing, and disinfection must be provided. The consolidation of transported items must comply with the cargo standards. Packaging of hazardous cargo with any other cargo in the same container is prohibited.

SUMMARY

While the previous MCDC MMA cycle provided the Conceptual Framework for a Modular Approach to Medical Support paper, the Medical Modular Approaches – Employment cycle´s intention was to develop a concept of employment. Utilising such a CONEMP creates opportunities throughout the MCDC cycle for nations to further investigate and develop the specific areas. This MMA-Emp is a result of the effort, analyses and comprehensive approach of TCNs/providers.

The MMA-Emp handbook produces a set of pre, peri and post mission guidelines to aid the medical planning process by identifying and mitigating risks inherent in delivering multinational medical capabilities outside of lead and framework nation constructs. Given the basic concepts for the “lead nation” or “framework nation”, this handbook goes beyond them by describing the scope and specificity of issues that will need to be considered. These include both physical and conceptual issues in order to ensure that multinational modular medical treatment facilities (M3TF) will function safely and effectively, meeting the assurance standards of all nations involved in the operation. This handbook has attempted to define the majority of the areas for the consideration of M3TF Commanders to build and deliver a viable modular capability for any mission or operation.

It is the first step in a long process to deliver the required medical capability. The intention is to further test and validate the MMA-Emp handbook to determine if it can serve as an effective tool helping planners to prepare, deploy and redeploy Role 2 M3TFs.

Medical support should always comply with the best medical practice and the laws, rules and requirements set out in national systems or by international organizations. The standards of practice and care delivered during operations should be at least equal to that delivered at the home base. This MMA-Emp handbook is intended to contribute to the ultimate purpose of preserving and restoring health.

ANNEX A CHECKLIST

1. PREDEPLOYMENT

1.1. Human Dimension Predeployment Checklist

The **human dimension** is about leader and fellowship, social and communication skills but also professional flexibility which are essential to ensure effective teamwork and cooperation and to overcome language barriers as well as different standards in education, training and credentialing.				
Serial	Task	Phase	Complete	Comments
H1	**Qualification and Language**	Predeployment		
H1.1	Language Skills: What is the working/common language in the mission?			
	Are participants able to speak/read/understand - is an average language communication level needed (SLP)?			
	Medical education is in which language?			
H1.2	Education: Are there comparable medical education levels and content?			
H1.3	Qualification Levels: Identify differences between qualification level of personnel in same function? (For instance OR-nurse; same type qualification),			
H1.4	Credentialing: Legal aspects: are personnel in same function allowed to take the same actions?			
H1.5	Patient treatment including pharmaceuticals: Do they have the same protocols?			
	Identify differences in use of pharmaceuticals: strength, amount, type, duration of use, etc.			
	Who is qualified and allowed to prescribe and/or administer?			
H2	**Leadership and Command**	Predeployment		
H2.1	Leadership/Technical/Medical Roles: If there are differences in roles between nations, take appropriate precautions to identify working and described responsibilities of personnel within the facility.			
H2.2	Ensure mutual understanding of			

	responsibilities between nations: level 1 preparation, vaccination, hygiene awareness, first aid, physical and dental fitness, military training are met by all TCNs.			
H2.3	Leadership: Ensure understanding of differences in leadership style between nations and individuals.			
	Hierarchical organisation versus flat organisation?			
	Consider perception of ranks/positions and differences in cooperation between ranks/positions.			
	Assess the consideration of ranks/positions versus expertise in a country?			
H2.4	Liaison: Evaluate the need for LNO to communicate with specific group of personnel and/or nations.			
H3	**Training and Mutual Trust**	Predeployment		
H3.1	Procedures: Differences in way of working can hamper trust. Training mutual procedures will gain trust, mutual training in predeployment phase is highly advisable.			
H3.2	Standards: Are the accepted medical standards/treatment protocols comparable, if not where do they differ?			
	Ensure standards are acceptable for all.			
H3.3	Teambuilding: Trust can be gained by teambuilding, getting to know and understand each other. Has a level of trust been established?			
	Are the expectations of each other's training levels addressed?			
H4	**Culture, Ethics and Religion**	Predeployment		
H4.1	Cultural treatment differences: Identify any cultural differences in interpretation of treatment protocols.			
H4.2	Prejudice: Are there any mental reservations /reserves against being treated by medical personnel of a contributing nation?			

	Mitigate prejudices where possible.			
H4.3	Gender: Are there differences in acceptance of gender (i.e. treatment, acceptance of leadership)?			
H4.4	Bias: Are there opinions of others way of working, or others level of professional standards, influencing the cooperation, and if yes, was the risk mitigated?			
H5	**Health and Nutrition**	Predeployment		
H5.1	Are there differences in food preparation methods?			
	Are there differences in type of meal during the day?			
	Are there types of “forbidden” food?			
	Are there national differences in daily caloric intake?			
H5.2	Nutrition habits: Difference in moment of day and time a meal will take?			
	Use of alcohol normal or not? (No alcohol rule versus wine/beer during lunch).			
	Other food habits (type of coffee or tea)?			
H5.3	Hygiene standards: Are there differences in national standard of hygiene?			
	Will hygiene regulations be verified by inspections?			
H5.4	Hygiene perception: Identify differences in what is considered as hygiene standard, as well for living/working environment and personal hygiene.			
H6	**Environmental Standard**			
H6.1	Have environmental aspects relative to infrastructure planning (i.e. building and operating M3TF) been taken into account?			
H6.2	Was an environmental evaluation to identify any environmental issues (e.g. contamination, hazards, and environmentally sensitive sites) conducted?			

1.2. Procedural Dimension Predeployment Checklist

Interoperability and capabilities: Validation of the Medical Lead Nation Chief Physician's coordination of Health Service Support (HSS) and Force Health Protection (FHP) is completed by the M3TF Commander in order to ensure earliest collaboration between TCN (Troop Contributing Nation) Modules.				
Serial	Task	Phase	Complete	Comments
P1	**M3TF Commander Assessment and Plan**	Predeployment		
P1.1	Coordinate HSS and FHP initiatives.			
	Assess standardisation, interoperability, and interchangeability of medical capabilities and materiel.			
	Identify HSS and FHP operations that require collaborative joint planning between senior commanders, Services, Defence agencies, NGOs, international organizations, and HN and multinational participants as required.			
	Develop the medical plan and course of action (COA) analysis.			
	Coordinate Patient Movement (PM) plans with Transportation Commands.			
	Develop considerations for HSS and FHP planning and operations (where applicable):			
	• Hospitalization			
	• Patient movement			
	• MASCAL			
	• Transportation assets			
	• MEDLOG Support			
	• Preventive Medicine (PVNTMED), biosurveillance, and comprehensive health surveillance			
	• Patient reception area (PRA)			
	• Medical aspects of reintegration			
	• Blood management			
	• Impacts of the law of war and medical ethics			
	• Medical aspects to support personnel recovery			
	• Medical repatriation of partner nation patients			

	• Veterinary services (to include but not limited to food protection support)			
	• Dental services			
	• Combat Operational Stress Control (COSC)			
	• Medical communications system and intelligence			
	• Host-Nation support (HNS)			
	• Medical civil-military operations (MCMO)			
	MLN Assessment of Command HSS with TCNs/providers´ Chief Physician(s):			
	• FHP operations during joint RMSD phase of the joint/multinational force deployment (redeployment) process			
	• Coordinate membership and required medical liaison relationships to appropriate Command staff organizations			
	• Assist multinational partner forces commands in identifying HSS and FHP requirements or shortages and assign cross-service/international support where practical; conduct liaison with senior medical member of each TCN			
	• Coordinate with all other medical support activities in the JOA that may play a role in the mission to ensure unity of effort (including but not necessarily limited to: NGOs, international organisations, multinational medical units, HN medical assets, and other governmental departments and agencies and activities/interest in the public health sector)			
P2	**Capability Review**	Predeployment		
P2.1	Ensure the M3TF C2 arrangements are clearly understood by all TCNs/providers.			
	Ensure appropriate Command /			

	Control authority has been granted from TCNs/providers to the M3TF Commander.			
	Establish a regular forum where TCNs/providers can come together to discuss clinical processes and outcomes.			
	Ensure all TCNs/providers are kept informed regarding the wider operational picture and expected patient load (utilised as a rule during Deployment Phase).			
	Establish a management cell to provide overarching C2 to the M3TF.			
	Ensure the key clinical management positions (MEDDIR, Senior nurse, etc.) are identified, agreed and filled by TCNs/providers?			
	Establish how TCNs/providers will complete reports and returns to satisfy both M3TF and national reporting requirements.			
P3	**Intermodularity and SOPs**	Predeployment		
P3.1	Confirm existing SOPs include all prerequisites and caveats.			
P4	**Intermodular Review**	Predeployment		
P4.1	Review, consider and test modular SOPs for transitions between intramodular processes.			
	Identify, mitigate and resolve any inconsistencies.			
	Provide SOPs to all TCNs for review.			
	Validate inter-modular processes through a clinical walk-through, TTX and during force integration, a LIVEX (if possible).			
P5	**Pan-M3TF SOPs**	Predeployment		
P5.1	Review pan-M3TF SOPs with TCN Modules' Senior Medical Officers. Make necessary adjustments.			
	Ensure SOPs are written from end-user perspective and are standardised.			
	Conduct final patient-based process TTX.			
	Ensure the final versions are shared with all TCNs.			
P6	**Governance and Assurance**	Predeployment		
P6.1	Ensure systems, processes and practices safeguard patients from			

	harm.			
	Review and share SOPs to ensure that practice is consistent and acceptable to TCNs/providers.			
	Ensure that SOPs and clinical guidelines relating to the treatment of patients provide a consistent and robust patient care pathway.			
	Develop M3TF specific SOPs which direct how the facility will operate from a C2 perspective.			
	Ensure all personnel know how to access all SOPs and are aware of any differences in practice/procedure and how this is to be managed between modules.			
P6.2	Determine if M3TF is appropriately staffed with sufficient numbers of suitable healthcare professionals.			
	Ensure that the skill-mix of healthcare professionals deployed by TCNs/providers is correct to meet the capability requirement statement.			
	Identify and mitigate any professional regulatory or scope of practice issues that may impact M3TF operations.			
	Where applicable, confirm credentialing of M3TF clinical staff was undertaken.			
	Ensure medical and pharmacological terms and measurements are understood and used consistently within the M3TF.			
P6.3	Agree on a common lexicon of medical terminology.			
	Ensure that a common formulary is produced to standardize the identification of available pharmaceuticals.			
	Ensure patients admitted to the M3TF are protected by the prevention and control of infection.			
	Establish M3TF wide roles and responsibilities for infection control and hygiene.			
	Identify M3TF Waste Management Plan that determines how hazardous and clinical waste will be collected, sorted, stored and disposed of safely.			
P6.4	Determine process for reporting and			

	investigating adverse clinical events to continually improve clinical care.			
	Ensure all personnel understand how to complete and submit incident reports to the M3TF chain of command.			
	Appoint a single POC to record and investigate adverse incidents and disseminate findings/lessons within the M3TF.			
	Ensure that external safety alerts or recalls are managed by the TCNs/providers within the M3TF and that any effect on output is identified and mitigated.			
	Establish dietary program for patients in order to promote healing.			
P6.5	Identify and mitigate any specific national, medical and/or religious dietary requirements.			
	Identify if standardized consent of care is covered in existing MoU.			
	Ensure all personnel understand how consent to care is to be gained, recorded and handed-over between modules (where applicable).			
	Identify and mitigate any national or religious consent issues and communicate this to all TCNs/providers.			
	Where applicable, implement prescribed process for managing consent issues where the patient lacks capacity to do so for themselves.			
P7	**Informational Procedures**	Predeployment		
P7.1	Ensure the following informational procedures:			
	• Collection of medical lessons/learned data.			
	• Establishment of a health surveillance capability.			
	• Receiving products associated with JIPOE.			
	• Coordination of medical information.			
	• Coordination of medical consultation services.			
	• Optimisation of communications equipment			

	compatibility.			
	• Utilisation of standardized operational and medical terminology reference guide.			
	• Establishment and maintenance of M3TF patient medical records.			
	• Collection and forwarding of medical statistical data.			

1.3. Technical Dimension Predeployment Checklist

‘The **technical dimension** should provide clear understanding of equipment specifications and user instructions, of supply and maintenance requirements, compatibility of systems as well as of functional output and effects, and is essential to overcome technical differences through transformation, conversion, professional expertise or mind-set’				
Serial	Task	Phase	Complete	Comments
T1	**Medical Materiel and Supplies**	Predeployment		
T1.1	Ensure that overall composition of medical materiel, supplies and pharmaceuticals in each module supports the tasks of M3TF.			
	Ensure medical materiel and supplies used for diagnosis and treatment safeguard patients from harm. (compliance with applicable laws – certification, declaration of conformity, Marketing Authorisation)			
	Ensure a list of medications for prescribing and ordering will be available and is appropriate to the M3TF’s mission.			
	Ensure controlled substances are accurately accounted IAW with applicable law and regulation.			
	Ensure all medical equipment, materiel, supplies and medication user manuals are in common M3TF language (e.g. English, electronically and/or in printing).			
	Ensure designated medical personnel receive cross training on how to use assigned medical equipment, materiel, supplies and pharmaceuticals.			
T1.2	Ensure Quality System for Blood and Blood Products is identified (e.g. EU Good Manufacturing Practices (GMP) Directive 2003/94/EC Directive 2005/62/EC).			
	Validate procedures for storage, distribution and transportation of blood and blood products in order to ensure blood quality during the deployment.			

	Ensure medical gases supply chain and system is developed.			
T1.3	Ensure safety system of medical gas distribution system (certified valves, cylinders, pipes, and connections) within M3TF.			
	Consider availability of alternative sources of medical gases (e.g. local providers).			
T1.4	Ensure pharmaceuticals, medical materiel and supplies accountability (expiry dates of all items are recorded, registered, monitored and regularly checked) system has been established.			
	Consider marking medical equipment, materiel, supplies and pharmaceuticals IAW the Geneva Convention.			
T1.5	Utilise interoperable standard stretchers (e.g. NATO standard) within M3TF.			
T2	**Medical Equipment**	Predeployment		
	Ensure medical equipment used for diagnosis and treatment safeguards patients from harm.			
	Establish medical equipment accountability system.			
T2.1	Ensure medical equipment has required documentation (e.g. history, operation /use time, maintenance / repair registered, calibration).			
	Ensure life supporting devices are capable of operating independently from the central power system with their own batteries (if applicable).			
T2.2	Determine if the M3TF has authorised medical technician maintenance and repair capabilities.			
T2.3	Consider equipment lifecycles in regard to the planned duration of the deployment.			
T3	**Infrastructure**	Predeployment		
T3.1	Ensure M3TF structure consisting of different modules meet the			

	interoperability and safety condition (e.g. floor, entrances, windows, roofs).			
	The planning consideration for infrastructure/place of deployment meet the protection and quality of life conditions to own forces and the whole M3TF.			
	Consider marking the M3TF IAW the Geneva Convention.			
T3.2	Ensure that modules and tents allow smooth inter-modular movement of patients within M3TF.			
	If adaptors are needed, ensure that they are available.			
T3.3	Determine interoperability of water connections between different medical modules (e.g. container/tent) within M3TF.			
	Ensure M3TF water supply, connections and installations are inspected and (if applicable) certified.			
	Ensure M3TF sufficient water tank capacity for required minimum of Days of Supply (DOS).			
T3.4	Facilitate power supply plan development and approval.			
	Determine interoperability of M3TF power supply of different medical modules.			
	Ensure M3TF power supply, electrical connections and installations (e.g. container/tent connection, safety of electrical equipment, cables, and cable ducts) are inspected and certified.			
	Confirm that the power resources meet capacity demands (output).			
	Requirements for Amperes and Voltage are known and have been considered.			
	Ensure M3TF emergency power (back-up system) is available.			
	If possible, ensure outlets for medical devices are labelled showing their operational status (switched on/off).			
T3.5	Ensure heating, ventilation, and air-conditioning (HVAC) systems in			

	critical areas meet M3TF's requirements and hygienic standards.			
T3.6	Determine if M3TF hospital information system comply with national regulations and legal constraints of each contributing nation.			
	Determine interoperability of M3TF different communications equipment and means (HW, SW) in containers/tents in order to establish the functional connection.			
	Where applicable, ensure CIS/C4I capability to fulfil the assigned tasks efficiently and effectively within M3TF.			
T4	**M3TF Information System**	Predeployment		
T4.1	Ensure the overall M3TF hospital information system protects the medical records and personal information.			
T4.2	Ensure availability of administrative SW tools.			
T4.3	Language lexicon translation (SW) is available.			
T5	**Telemedicine / Telehealth**	Predeployment		
T5.1	Determine M3TF medical structure and equipment availability to perform telemedicine / telehealth.			
T5.2	Ensure M3TF communications bandwidth capacity to support planned telemedicine / telehealth.			
T6	**Waste Management**	Predeployment		
T6.1	Ensure medical waste collection is arranged.			
T6.2	Ensure medical waste treatment and disposal are arranged.			
T7	**Storage Capability, Capacity and Sustainment**	Predeployment		
T7.1	Ensure M3TF has an accountability system in place for the inventory, handling, and storage of medical equipment, materiel, supplies and pharmaceuticals.			
	Ensure medical equipment, materiel, supplies and pharmaceuticals are properly and			

	safely stored for product stability.			
	Ensure M3TF has sufficient medical gas storage for required minimum of DOS.			
T7.2	Ensure requirements for specific storage conditions are identified (room temperature and humidity control, cool and freezer capability, etc.).			
	Determine and ensure M3TF has appropriate capacity and conditions for storage of blood and blood products.			
T7.3	Ensure that established storage (warehouse) and supply chain meet the M3TF requirements.			
T7.4	Ensure sterilization, laundry and cleaning services are available.			
T8	**Transportability/Manoeuvrability**			
T8.1	Consider M3TF transport means (technical and human resources).			
T8.2	Determine M3TF ability to transport, move, or deploy (personnel, equipment, supplies) to the right place at the right time within AOO.			

2. DEPLOYMENT

1. Human Dimension Deployment Checklist

*´The **human dimension** is about leader an fellowship-, social and communication skills but also professional flexibility which are essential to ensure effective teamwork and cooperation and to overcome language barriers as well as different standards in education, training and credentialing'*				
Serial	Task	Phase	Complete	Comments
H1	**Qualification and Language**	Deployment		
H1.1	M3TF personnel are able to speak/read/understand the working/common language.			
	Is the common language used in the Medical treatment and registration and understandable to all users? If no, are interpreters available?			
H1.2	Differences in use of pharmaceuticals: strength, amount, type, duration of use, etc. are continuously evaluated and adapted, if necessary.			
	Personnel qualified and allowed to prescribe and/or administer pharmaceuticals are known and comply with the SOPs.			
H1.3	Are the medical education levels and content as defined in the predeployment clear to everyone and usable in daily practice?			
	Are the agreed standards, SOPs and protocols utilised?			
	Is there a system of improvement of the medical skills of the M3TF by additional education in place and functioning?			
H1.4	Are the identified differences between qualification levels of personnel in same function (e.g. OR-nurse) workable? Do they need refined or adjusted?			
H1.5	Credentialing - Legal aspects: are personnel in same function allowed to take the same actions?			
	Are adjustments necessary?			

H1.6	Patient treatment including pharmaceuticals: Are the predeployment agreed protocols used?			
H2	**Leadership and Command**	Deployment		
H2.1	Leadership/Technical/Medical Roles: Are the identified common roles between the nations and different working methods and responsibilities described workable?			
	Are identified risks due to the differences in working methods and responsibilities mitigated?			
H2.2	Mutual understanding of responsibilities between nations: level 1 preparation, vaccination, hygiene awareness, first aid, physical and dental fitness, military training etc. Are they understood and respected by all nations?			
	Is there frequent coordination with Senior National Representatives (SNRs) and/or LNOs of the TCNs/providers in order to address and respect national regulations?			
H2.3	Is use of different leadership styles needed?			
	Are the different leadership styles used effective?			
	Are there problems in the perception of ranks/positions and differences in cooperation between ranks/positions?			
	Is expertise, regardless of ranks/positions, appreciated and valued in the M3TF?			
	Do personnel have confidence in M3TF leadership?			
H2.4	Are M3TF personnel able to communicate potential issues/problems?			
	Is the communication between M3TF and nations effective?			
H3	**Training and Mutual Trust**	Deployment		
H3.1	Are SOPs regularly trained,			

	evaluated and improved?			
	Is additional training needed to familiarize “newcomers” with the SOPs?			
	Is there mutual trust in the SOPs?			
H3.2	Are the accepted medical standards/treatment protocols, given the identified differences in the predeployment phase usable to all personnel?			
	Do the agreed medical standards/treatment protocols lead to an accepted quality of medical care?			
H3.3	Were predeployment training level expectations adequate?			
	Did the teambuilding training result in better understanding and mutual trust?			
H4	**Culture, Ethics and Religion**	Deployment		
H4.1	Cultural treatment differences: Are any differences in interpretation of treatment protocols mitigated?			
H4.2	Prejudice: Did the training in the predeployment phase reduce or eliminate prejudices amongst personnel from different nations?			
	Are there any mental reservations /reserves against being treated by medical personnel of a contributing nation?			
H4.3	Are any differences in acceptance of gender (i.e. treatment, acceptance of leadership) mitigated? Do M3TF personnel and patients feel respected and appreciated?			
H4.4	Bias: If there are any opinions of different ways of working, that are influencing cooperation, have they been mitigated?			
H5	**Health and Nutrition**			
H5.1	Nutrition standards:			

	Are various food preparations/services available to support the specific needs of personnel/patients of the M3TF:			
	• type of meal during the day			
	• prevention of personnel and patients from being exposed to types of “forbidden” food			
	• reflecting national differences in daily amount of calories			
	Are the personnel and patients satisfied with the food services provided in the M3TF?			
H5.3	Are hygiene regulations/standards for the M3TF personnel and patients respected, maintained and inspected?			
H5.4	Hygiene perception: Are the agreed hygiene standards for living/working environment and personal hygiene maintained?			

2. Procedural Dimension Deployment Checklist

Key M3TF functions performed during the Deployment Phase include (but are not limited to): MASCAL, Patient Movement and Health Care Record Management. The M3TF Commander must ensure that all TCNs/providers are kept informed regarding the wider operational picture and expected casualty load including MASCAL, Patient Movement and Health Care Record Management.				
Serial	Task	Phase	Complete	Comments
P1	**Mass Casualty Situations**	Deployment		
P1.1	Refine MASCAL SOPs with MLN Chief Physician, including casualty management from CBRN incidents.			
	Regularly rehearse MASCAL procedures.			
	Ensure mental support personnel are present to support patients and staff during and after MASCAL situations.			
P2	**Patient Movement**	Deployment		
P2.1	Collaborate with TCNs on their PM policies throughout medical evacuation chain.			
	Establish/review/publish multinational PM MoU.			
	Utilise directed PM Communications System(s).			
P3	**Health Record Management**	Deployment		
P3.1	Ensure effective Health Record Management System complies with MLN and TCN legal requirements.			
	Ensure medical staff access to patients' medical history, either by enabled CIS compatibility with TCN Electronic Health Care Records System or by use of paper medical history.			
	Ensure provision and utilisation of the M3TF patient-unique identification codes.			
	Ensure health records are contemporaneous, clear, legible and correct.			
	On discharge, ensure patients are provided a copy of their health record that includes their personal information, the M3TF information, medical (clinical) information and authentication.			

3. Technical Dimension Deployment Checklist

MMA-EMP TECHNICAL DIMENSION DEPLOYMENT CHECKLIST

*'The **technical dimension** should provide clear understanding of equipment specifications and user instructions, of supply and maintenance requirements, compatibility of systems as well as of functional output and effects, and is essential to overcome technical differences through transformation, conversion, professional expertise or mind-set'*				
Serial	Task	Phase	Complete	
T1	**Common Funding**	Deployment		
T1.1	Determine if common funding is available to support multinational common costs and expenditures.			
T1.2	Ensure that all funds and expenses are properly accounted and reported.			
T2	**Medical Materiel and Supplies**	Deployment		
T2.1	Has a clear responsibility been established among nations for supplying the M3TF?			
T2.2	Are controlled substances accurately accounted for IAW applicable laws and regulations?			
T2.3	Are procedures for distribution, handling and transportation of blood and blood products validated (Quality System) and in place?			
T2.4	Ensure safety of medical gas distribution system (certified valves, cylinders, pipes, and connections) is maintained.			
	Are there any alternative sources of medical gases?			
T2.5	Are medical equipment, materiel, supplies and medication properly marked IAW the Geneva Convention?			
T2.6	Ensure a list of medications for prescribing and ordering is available and utilised.			
T3	**Medical Equipment**	Deployment		
T3.1	Are available authorised medical technician maintenance and repair capabilities system utilised.			
T3.2	Are equipment and supplies maintained to ensure a safe and secure work environment/patients safety and full functionality?			
T3.3	Medical equipment program (lifecycle) is managed by qualified			

	individuals.			
T4	**Infrastructure**	Deployment		
T4.1	Is M3TF properly marked IAW the Geneva Convention?			
T4.2	Do modules and tents allow smooth inter-modular movement of patients within M3TF?			
T4.3	M3TF is following the agreed safety, security and hygiene standards.			
T4.4	Water supply connections and installations (e.g. container/tent connections) are inspected and certified.			
	M3TF has sufficient water tank capacity for required minimum of Days of Supply (DOS).			
	Is alternative water supply available?			
	Is the quality of water in line with agreed standards and can be regularly checked?			
	Are water storage tanks protected and in secure locations?			
T4.5	Power supply, electrical connections and installations (e.g. container/tent connection, safety of electrical equipment, cables, and cable ducts) are certified and regularly inspected.			
	Do the organic and/or local power resources meet capacity demands (output)?			
	Does M3TF have a back-up power system available?			
	Is there an emergency lighting system in place?			
T4.6	Do heating, ventilation, and air-conditioning (HVAC) systems in critical areas meet M3TF's requirements and hygienic standards?			
T5	**Waste Management**	Deployment		
T5.1	Is a Waste Management Plan (or similar) updated based on mission conditions and requirements?			
	Does the Waste Management Plan also include the treatment and disposal of medical waste?			
	Does M3TF have the possibility to			

	arrange the alternative/local disposal of the medical waste?			
T6	**M3TF Information System**	Deployment		
T6.1	Does the overall M3TF hospital information system protect the health records and personal information?			
T6.2	Where applicable, does CIS/C4I capability ensure fulfilment of the assigned tasks efficiency and effectiveness within M3TF?			
T6.3	Are administrative SW tools available?			
T6.4	Do M3TF medical structure and equipment have the ability to perform telemedicine/telehealth?			
T6.5	Does M3TF communications bandwidth have the capacity to support telemedicine/telehealth?			
T7	**Storage Capability, Capacity and Sustainment**	Deployment		
T7.1	Does M3TF have an accountability system in place for the inventory, handling, and storage of medical equipment, materiel, supplies and pharmaceuticals?			
	Are storage conditions for pharmaceuticals and medical materiel in compliance with applicable requirements?			
	Are storage conditions checked, monitored and recorded (e.g. room temperature and humidity control, cool and freezer capability)?			
	Does M3TF have sufficient medical gas storage for required DOS?			
T7.2	Is there sufficient protection of medical gas tanks and/or cylinders and related equipment?			
T7.3	Does M3TF have appropriate capacity with proper conditions for storage and handling of blood and blood products?			
T7.4	Medical equipment, materiel, supplies and pharmaceuticals in each module can be replaced or replenished IAW developed plan.			
T8	**Transportability/Manoeuvrability**	Deployment		
T8.1	Does M3TF have a plan and			

	transport means (technical and human resources) to move (personnel, equipment, supplies) to the right place at the right time within AOO?			

3. REDEPLOYMENT

1. Human Dimension Redeployment Checklist

*The **human dimension** is about leader an fellowship-, social and communication skills but also professional flexibility which are essential to ensure effective teamwork and cooperation and to overcome language barriers as well as different standards in education, training and credentialing'*				
Serial	Task	Phase	Complete	
H1	**Qualification and Language**	Redeployment		
H1.1	Was a standard in prescribing/administering medicine/treatment achieved between TCNs during deployment?			
H1.2	Was communication between M3TF personnel in working language sufficient to meet mission objectives?			
	How did working language used in medical treatment and registration impact M3TF personnel collaboration?			
H1.3	Was knowledge shared among M3TF personnel to improve medical skills, standards, protocols and SOPs?			
	Were improvements in agreed routines, protocols and SOPs captured for future references?			
H1.4	Qualification Levels: Were any problems identified concerning different levels of education/ qualification/treatment measures during mission?			
	If yes, what should be considered in the Predeployment phase to minimise issues?			
H1.5	Credentialing: Were all personnel in same functions/responsibilities allowed and able to take the same actions?			

	What adjustments (if any) were made during the mission? What were the issues that had to be adjusted?			
H1.6	Patient treatment: Were the predeployment agreed protocols sufficient?			
	If no, what protocols were changed and why?			
H2	**Leadership and Command**	Redeployment		
H2.1	Leadership/Technical/Medical Roles: Were the agreed upon roles sufficient for the mission? If no, what adjustments should be made?			
H2.2	Were the responsibilities between nations: level 1 preparation, vaccination, hygiene awareness, first aid, physical and dental fitness, and military training met by all TCNs/providers, etc.? Were they understood, respected and fulfilled by all TCNs?			
	Was frequent interaction with LNOs utilised to respect national regulations and address any issues between specific groups of personnel?			
	What significant problems appeared during the mission and how were they addressed?			
H2.3	Leadership: Was the M3TF leadership well-prepared for the mission? Were any leadership style adaptions needed?			
	Were there issues in cooperation between ranks/positions? How were they mitigated?			
	Was expertise, regardless of rank, appreciated and			

	valued in the M3TF?			
	Were teambuilding efforts helpful in creating trust and cooperation within M3TF personnel?			
H2.4	What should be changed in Predeployment phase to enhance communication?			
H2.5	Were certificates and international evaluation forms filled out and given to the M3TF personnel?			
H3	**Training and Mutual Trust**	Redeployment		
H3.1	Were SOPs regularly trained, evaluated and improved?			
	Were there any trust related issues concerning SOPs?			
H3.2	Were the agreed medical standards/treatment protocols usable to all personnel?			
	Did the agreed medical standards/treatment protocols lead to an accepted quality of medical care?			
H3.3	What additional training was needed?			
	Did additional training result in better understanding and enhanced mutual trust among M3TF personnel?			
H4	**Culture, Ethics and Religion**	Redeployment		
H4.1	Cultural treatment differences: Were any differences in interpretation of treatment protocols mitigated?			
H4.2	Did the training and teambuilding efforts contribute to mitigate prejudices?			
	Were there any obvious reservations or open prejudices during the mission on the team or by patients treated by M3TF personnel?			

	If yes, what measures were taken?			
H4.3	Were issues in acceptance of gender mitigated (i.e. treatment, acceptance of leadership)?			
H4.4	Bias: How were any differing opinions of others way of working, or others level of professional standards that influenced cooperation mitigated?			
	What measures were taken to improve acceptance of a common way of working?			
H5	**Health and Nutrition**	Redeployment		
H5.1	What (if any) food preparation/service-related issues were experienced and how were they addressed?			
H5.2	Hygiene standards: Were the agreed hygiene standards for living/working environment and personal hygiene respected and maintained?			
	Were inspections to verify compliance on regulations conducted? If any problems were identified, how were they addressed?			
	Were hygiene levels constantly checked and maintained by M3TF leadership?			

2. Procedural Dimension Redeployment Checklist

Key M3TF functions performed during the Re- Deployment Phase include (but are not limited to): Continuation of Theatre Health Surveillance, Force Health Protection During Reverse Reception, Staging, Onward Movement and Integration as well as Medical Logistics Collaboration. The M3TF Commander must ensure coordination and completion of each.				
Serial	Task	Phase	Complete	Comments
P1	**Continuation of Theatre Health Surveillance**	Redeployment		
P1.1	Ensure continued adherence to the HSS plans and orders directed by the MLN Chief Physician.			
P2	**Force Health Protection During RMSD**	Redeployment		
P2.1	Be prepared to collaborate with and follow the MLN Chief Physician's plans and orders for potential support of aerial port and sea port debarkation functions.			
P2.2	If the M3TF is departing theatre without replacement, ensure continuation of minimum operations in preparation for departure from theatre.			
P2.3	If the M3TF is departing theatre with follow-on replacement, synchronize effort to transfer FHP capabilities into the operational Commander's force and/or the incoming M3TF.			
P2.4	Ensure appropriate personnel redeployment measures are followed (e.g. orders, weapons, health protections, etc.).			

3. Technical Dimension Redeployment Checklist

'The transition from deployment to redeployment phase is critical in assurance of synchronization of closing operational capability and disassembling of the M3TF. In the technical dimension the redeployment planning is mostly related to the transfer of infrastructure, equipment, and materiel from AOR to home base.				
Serial	Task	Phase	Complete	Comments
T1	**Medical Materiel and Supplies**	Redeployment		
T1.1	Has the inventory been conducted to identify medical materiel, supplies and pharmaceuticals suitable for redeployment?			
T1.2	Are controlled substances accurately accounted for IAW applicable laws and regulations?			
T1.3	Are procedures for storage and transportation of products validated to ensure their safety during the redeployment?			
T1.5	Monitor overall consumption of M3TF medical materiel, supplies and pharmaceuticals in order to reduce the overall logistics footprint.			
T1.6	Were obsolete medical materiel, supplies and pharmaceuticals accounted for and/or disposed of according to applicable laws?			
T1.7	Were eligible surplus medical materiel, supplies and pharmaceuticals identified and redistributed to other M3TFs in the AOO or granted to local government/authorities/NGOs?			
T1.8	Are transport containers or means containing medical materiel, supplies and pharmaceuticals marked IAW the Geneva Convention?			
T2	**Medical Equipment**	Redeployment		
T2.1	Has the inventory been conducted to identify medical equipment suitable for redeployment?			
T2.2	Prepare eligible medical equipment compliant with applicable laws for redeployment.			

T2.4	Was obsolete medical equipment accounted for and/or disposed of according to applicable laws?			
T2.5	Was eligible surplus medical equipment identified and redistributed to other M3TFs in the AOO or granted to local government/authorities/NGOs?			
T2.6	Has medical equipment requiring maintenance been identified?			
T3	**Infrastructure**	Redeployment		
T3.1	Has M3TF infrastructure been identified for redeployment?			
T3.2	Has M3TF site restoration been coordinated?			
T4	**M3TF Information System**	Redeployment		
T4.1	Ensure health records and personal information are archived.			
T4.2	Is handover of the medical records and personal information to the TCNs conducted IAW the TA?			
T5	**Waste Management**	Redeployment		
T5.1	Is the Waste Management Plan (or similar) followed until the M3TF is redeployed?			
T5.2	Has medical waste been treated and disposed IAW the plan?			
T6	**Storage Capability, Capacity and Sustainment**	Redeployment		
T6.1	Are specific storage conditions requested for transport (e.g. room temperature and humidity control, cool and freezer capability)?			
T7	**Transportability/ Manoeuvrability**	Redeployment		
T7.1	Has the redeployment plan been approved?			
T7.2	Are the transport requirements (e.g. size, type, capacity, loading on pallets, containers, and flat racks etc.) met?			
T7.3	Does M3TF have its own transport means (technical and personnel)?			
T7.4	Has transport been requested?			
T7.5	Have infrastructure, medical materiel and supplies been			

	adequately cleaned, washed, and disinfected and certified for transport?			
T7.6	Have infrastructure, medical materiel and supplies been adequately packed and labelled for transport?			
T7.7	If required, have infrastructure, medical materiel and supplies been prepared for customs inspections?			

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