Ministry of Defence

Medical Operating Concept

Medical Operating Concept

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Integrated Concepts Board

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Preface

Purpose

1. This *Medical Operating Concept* (MedOpC) provides the conceptual narrative to how the Defence Medical Services (DMS)[1] will respond to the strategic direction of the *Integrated Review*, *Defence Command Paper*, and *Integrated Operating Concept* (IOpC). It explores the challenges of providing medical support across the Integrated Operating Framework (IOF) within the likely constraints of Integrated Force 2030 and proposes ways to optimise medical capability.

2. MedOpC will help to inform policy direction, force development and investment decisions out to 2030. It will prompt areas that require further exploration through research, innovation and experimentation. The concept will provide a keystone for further concept work on how medical and health activity might be delivered in the future.

3. MedOpC recognises that the IOpC represents a shift in how the military is used away from contingency for major operations towards a continuous campaign of operating activity across a dispersed global footprint. The DMS has experience in providing medical support to small scale activities but transitioning to optimise for this way of working as the 'new normal' requires a degree of mindset shift by the whole organisation. There are risks and challenges that must be understood and addressed, which will require difficult decisions and resource commitments to be made.

Context

4. MedOpC has three primary aims. These are to:

- identify the key challenges of delivering medical support to the IOF within the likely operating context out to 2030;
- highlight the medical risk of the IOF demand and propose ways to manage it; and

1 Headquarters Defence Medical Services Group and the respective medical services of the single Services.

- explore how the DMS can optimise medical operational capability that is adaptable across the IOF continuum to meet the challenges of 'operate' activities whilst retaining a credible ability to support 'warfight' activities.

Audience

5. This concept is essential for DMS force development personnel and policymakers and is of value to all DMS personnel to understand how we must shape ourselves out to 2030. Those who own/hold the risk and plan Defence activities will need to understand the challenges of medical support over this time frame, including the proposed approaches, to inform their own thinking and decisions.

Structure

6. MedOpC is structured across six chapters. A brief synopsis of each is below.

a. **Chapter 1 – Medical contribution to the Integrated Operating Framework.** Chapter 1 introduces the medical contribution to the IOF and describes how this shift in Defence posture may create an increased demand for medical operational capability. The chapter discusses the need to manage the resultant medical risk and proposes some ways that this can be achieved.

b. **Chapter 2 – Medical challenges and implications.** Chapter 2 explores the state of global health care and the operating context and identifies some key challenges for delivering medical support to the IOF. The chapter outlines the implications for the supported population at risk and the delivery of operational patient care pathways.

c. **Chapter 3 – Optimising medical support to the operate function.** Chapter 3 explores ways to optimise medical support across the IOF. The chapter considers the development of medical capability to make efficient use of resources and enhance operational patient care pathways. It looks at priority areas for innovation and technology and highlights the importance of the medical workforce.

d. **Chapter 4 – Medical support to warfighting.** Chapter 4 looks briefly at the challenges of delivering medical support to the whole continuum of the IOF. The chapter considers the requirement to maintain credible

medical support to warfighting and how this might be balanced with the delivery of medical support to operating activity.

e. **Chapter 5 – Medical operating advantage.** Chapter 5 explores the potential for medical activity to contribute to operating advantage. The concept looks beyond the provision of quality medical support to deployed personnel to consider additional ways that medical assets might have an effect.

f. **Chapter 6 – Conclusions and recommendations.** Chapter 6 pulls together the key conclusions of this concept. It sets out recommendations to force developers, policy-makers and senior leadership for how to optimise medical capability in support of the IOF.

Linkages

7. This concept is underpinned by a number of policy, strategy, doctrine and conceptual publications. These are:

- *Global Britain in a competitive age: The Integrated Review of Security, Defence, Development and Foreign Policy* (referred to as the *Integrated Review* throughout);
- *Defence in a competitive age* (referred to as the *Defence Command Paper* throughout);
- *Defence Strategy 2022*;
- *Integrated Operating Concept*;
- *Support Operating Concept*;
- *Defence Medical Direction 22* (pending);
- *Joint Medical Operational Capability Requirement 22*;
- *Strategic Delivery Plan for DMS Research 21-26*;
- Allied Joint Publication (AJP)-4.10, *Allied Joint Doctrine for Medical Support*; and
- subordinate doctrine publications to AJP-4.10.

Limitations

8. This concept does not include veterinary support.

9. This concept has drawn upon current research where this has informed the inputs of subject matter experts, extant or advanced draft publications and military judgement. Novel research was not commissioned for this concept due to time, but it will prompt further research for the future.

10. This concept does not attempt to provide specific capability or discuss organisational, or workforce changes required for the Integrated Force 2030. Strategy is to be provided within *Defence Medical Direction 22*, the *Joint Medical Operational Capability Requirement 22* and *Joint Medical Operational Workforce Requirement 22*.

11. The concept does not cover detail of how medical support should be delivered to specific types of operations; this will be addressed through the development and update of medical doctrine as appropriate.

Contents

Chapter 1

Medical contribution to the Integrated Operating Framework

Chapter 1 introduces the medical contribution to the Integrated Operating Framework and describes how this shift in Defence posture may create an increased demand for medical operational capability. The chapter discusses the need to manage the resultant medical risk and proposes some ways that this can be achieved.

Change in Defence posture

1.1. The strategic context is increasingly complex, dynamic, and competitive. We are in an age of pervasive information, rapid technological change and continuous competition with rivals who seek to undermine the UK's strategic position in key regions of the world. Our competitors aim to undermine our cohesion and erode resilience; seeking to gain advantage with attacks that are below the threshold that would provoke a warfighting response or have unclear attribution.

1.2. Direction was issued in the *Integrated Review* and the *Defence Command Paper* to respond to this changing character of conflict and strategic context. They propose a fundamental shift in how the military is used, with a more assertive and global Defence posture. The military will be increasingly employed to operate below the threshold of war to maintain or gain advantage. This will bring a change in the tempo and conditions of operating activity away from a static, homeland-based contingency response to a campaign footing of continuously operating around the world. The shift in the use of the military requires a responsive adjustment of medical support delivery.

1.3. The *Integrated Operating Concept* (IOpC) introduced the Integrated Operating Framework (IOF) which provides the framework for the new approach to Defence activity and distinguishes operate (protect, engage and constrain) as the continuous campaigning approach to gain advantage, from warfighting, conducted in extremis. Figure 1.1 shows how medical activity will be aligned to the IOF.

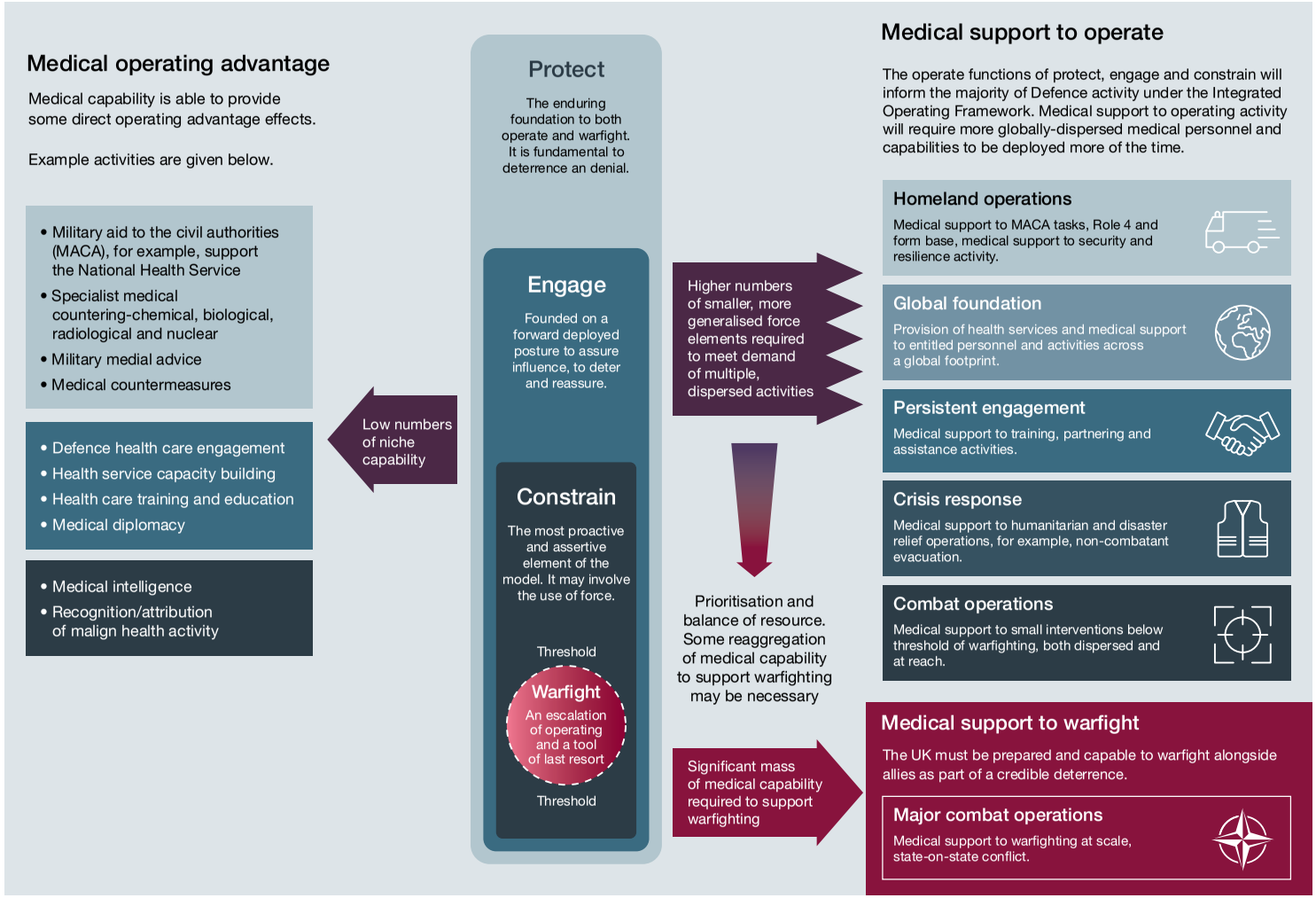


Figure 1.1 – Medical contribution to the Integrated Operating Framework

1.4. Medical capability will contribute to the IOF in three broad ways. These are described below.

a. **Medical support to operate.** Medical support entails planning and providing medical and health services to support an activity (to maintain force strength through disease prevention, evacuation, rapid treatment of the wounded, injured or sick, recovery and return to duty). Continuous operating activity in the homeland and overseas, will generate a high demand for medical capability to support activity across the operate functions.

b. **Medical support to warfighting.** Defence must continue to prepare for and maintain a credible ability to conduct warfighting at scale for deterrence. Warfighting will require a significant mass of deployed medical capability to support the force and deal with significant numbers of casualties.

c. **Medical operating advantage.** In addition to the physical and moral advantage derived from medical support to the force, medical capability can also directly deliver advantage through its activities. For example, through delivery of global health care engagement and medical intelligence gathering. Opportunities for advantage should be sought in all activity but must be balanced against resources (with priority to supporting the force), be legal and ethical and be coherent with strategic and operational objectives.

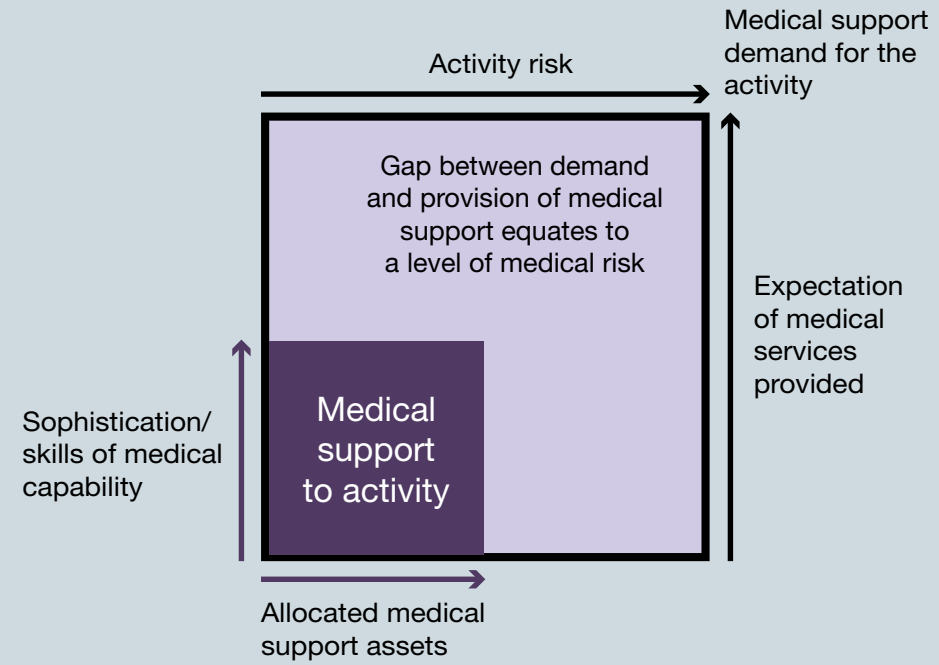
Increased demand for medical support

1.5. Every Defence activity carries a level of medical risk of death, injury or illness that can to a greater or lesser extent be mitigated by medical support. Defence expects that the Defence Medical Services (DMS) will provide or arrange for an acceptable level of medical support to enable tasks. However, not all operating activity can be supported with a comprehensive deployed military medical support chain. For example, a highly sophisticated hospital cannot deploy in support of every activity, yet access to that level of capability might be required no matter how small the deployed force. Increasing the ambition for concurrent, persistent engagement of multiple small force elements around the globe therefore represents a significant increase in demand for medical capability.

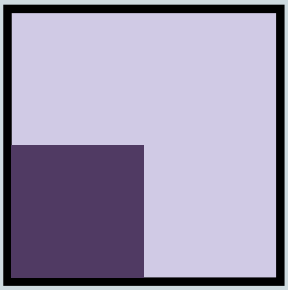
Managing the medical risk of increased demand

1.6. Fulfilling the IOF will require Defence to understand that the medical risk associated with Defence activity will need to be reappraised as the way of operating changes. There will be a need to consider, and make tough decisions on, the appetite to expose personnel to harm given the nature and imperative of each task, and how to best balance and optimise the finite medical resource across all IOF tasks. Figure 1.2 provides a visual representation of some possible options to manage medical risk where demand for medical support overmatches available resource.

Operational demand versus availability of medical support



Approach 1 – do nothing and tolerate some risk

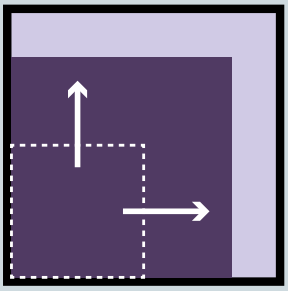


The chain of command should accept that there is a level of risk to operating activity that medical support can rarely fully mitigate.

Tolerating risk to achieve operational imperatives is a legitimate course of action.

Senior levels of command must clearly articulate their risk appetite and the risk that is accepted.

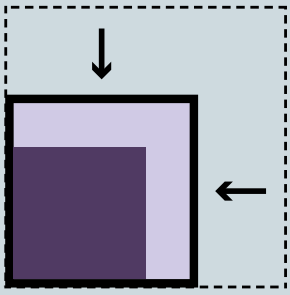
Approach 2 – increase medical support capability



Enhance capability
Upskill the medial team/use technology to raise capability sophistication for the same headcount.

Allocate more capability
Resources are finite and must be prioritised across all activity. Increased activity may require an uplift in overall resource (within headroom constraints). However, there are finite gains from a 'more of the same' approach. Outsourcing some provision to host/partner nation or contractor could assist.

Approach 3 – reduce operational demand



Rationalise expectation
Commanders and medical personnel must temper their expectation that a gold standard of care can always be achieved in difficult operating contexts. Realistic expectations will allow medical capability to be correctly prioritised.

Reduce activity/exposure to risk
The Defence Medical Services exist to enable activity. However, medical support is not an insurance policy to buy-out unnecessary risk. Where the demand for medical support outstrips availability and tolerable risk, Defence may need to reduce the ambition.

Figure 1.2 – Possible approaches to manage the medical risk of increased operational demand

1.7. **Tolerating more medical risk.** The chain of command, advised by their military medical staffs, must have a realistic understanding of medical risk and what can be achieved in terms of patient outcomes across the operational demand and within the constraints of operational reality and available medical support assets. Risk appetite and the willingness to tolerate adverse outcomes might need to vary for different activities considering, for example, operational necessity. Taking increased risk to deliver operational outputs is a legitimate course of action. However, if Defence takes more risk to meet a level of ambition, this must be coherent with the strategic, political and societal appetite for adverse patient outcomes. Experience has shown that where appetite to sustain casualties is low, there is likely to be significant scrutiny of Defence procedures, risk management and medical provision in the event of incidents, especially Service deaths. This could lead to, for example, Crown censure, legal or professional action taken against individuals. Operators and health care deliverers must be given confidence that if directed to operate at higher risk, they will not suffer undue repercussions in the event of adverse outcomes.

1.8. **Increase relative medical capability.** Meeting increased demand could be achieved through a relative increase of available medical capability. This might be through the following three ways.

a. **Increased resource.** 'More of the same' capability will not necessarily address the demand of the IOF. Procurement of medical capability must be agile to respond to operating requirements and emerging threats. Solutions must be efficient and flexible to adjust to multiple and changing requirements across the IOF.

b. **Outsourcing.** Outsourcing (or 'buying in') elements of medical support including resupply and servicing to contractors, host nations, or partner nation facilities could be used more to prioritise military medical capability for higher risk activities.

c. **Optimisation of capability.** A 'do more with less' approach is necessary to meet increased demand and could be achieved through uplifting the skills of small teams and achieving the sophisticated capability of larger medical facilities further forward in the operational patient care pathway.

1.9. **Reduce demand.** There are two key approaches to reduce the relative demand for medical capability. These are described below.

a. **Rationalise expectations of care.** The DMS aims to deliver a standard of medical care on operations that is comparable to the National Health Service or the accepted international standard. To fulfil the Defence ambition, it is necessary to consider the best effort care that can be achieved in the operational situation. A 'gold standard' may be unrealistic without disproportionate allocation of resource. The decision on whether the standard of care that can be delivered for an activity is safe and acceptable sits with the chain of command, informed by medical advice.

b. **Reduce or change nature of activity.** If no other course of action to align demand with available capability is acceptable, operational activity must be scaled back until it is supportable.

1.10. These options should form the basis for testing and force development decisions as the IOpC is operationalised. The DMS is best positioned to shape the optimisation of medical capability to meet the demand; this is explored further in this concept.

Key points

- The changing character of conflict prompted a shift to a Defence posture, which must be met with a shift in how medical support is delivered.
- The IOF represents an increased demand for medical capability, introducing a level of medical risk that must be managed.
- Broad approaches to manage the increase demand could include the following.
    - Acknowledge that increased risk might need to be taken against some activity.
    - Optimise medical support capability to meet demand (this option is expanded within this concept) by:
        - outsourcing: contract services or rely on host nation;
        - procuring capability to meet shortfall, acknowledging 'more of the same will not address all issues; or
        - enhancing skills and sophistication to 'do more with less'.
    - Reduce the demand by:
        - rationalising expectations for what medical support can achieve; and
        - scaling back the volume or risk of Defence activities.

Notes

Chapter 2

Challenges of the medical operating context

Chapter 2 explores the state of global health care and the operating context and identifies some key challenges for delivering medical support to the Integrated Operating Framework. The chapter outlines the implications for the supported population at risk and the delivery of operational patient care pathways.

Global health care

2.1. **Health security threats.** Health security threats such as pandemics and antimicrobial resistance are a very real prospect for the next ten years with potentially catastrophic consequences globally. The UK will need to secure and contribute to resilience by maintaining integral Defence Medical Services (DMS) expertise to monitor and respond to health threats and collaborate with national and international partners for resilience.

2.2. **Technology advancement.** Health care will continue to be more sophisticated and costly, and Defence will need to keep pace with rapid technological advancements whilst upholding legal and ethical values. The system for procurement needs to be more agile and free from undue policy and regulatory restrictions to allow rapid transactions to be made. Automation and artificial intelligence are becoming more prominent within industry and need to be exploited for military advantage.

2.3. **Competition for resource.** Competition for medical resources such as pharmaceuticals, gases and blood products will increase across the global health care system. Climate change compounds resource scarcity, adding political pressure to reduce carbon emissions constraining manufacture and procurement. Many items of medical materiel are reliant on supply from East Asia, with few alternatives. Defence will need to identify reliable supply sources, consider intelligent stockpiling and burden-sharing with collaborators. Increasing self-sufficiency through sovereign capability would decrease reliance on competitors. There is a current global shortfall of health

care workers which threatens the ability for the UK, Defence and our allies to maintain their workforces in a competitive market.

2.4. **National health.** Defence is to a degree dependent on the state of UK population health, the National Health Service (NHS)[1] and professional regulatory bodies. The health of the general population is reflected in the health of Defence personnel. A functioning homeland health service is essential to restoring the health of Defence personnel injured on operations. The majority of DMS health care personnel work in the NHS when not deployed and maintain training and clinical currency through civilian practice. Shocks to national health such as pandemics, or structural changes to health services, training and regulation, can therefore impact the DMS, and a mutually supportive relationship is increasingly important.

Operating context

2.5. **Novel weapons and tactics.** Competitors are rapidly and continuously developing new weapons and tactics. There must be ongoing analysis and research of the likely injurious effects of weapon systems and techniques used by adversaries, as well as into effective countermeasures and treatments. Use of human augmentation or performance enhancement, without the constraint of Western legal and ethical norms, may be used as a weapon and cause physical or psychological injury of personnel.

2.6. **Disregard for law and ethics.** Adversaries are unlikely to constrain their actions by the law of armed conflict or Western ethical standards, and they may seek advantage through active disregard (for example, the targeting of health care facilities to reduce morale or the use of prohibited substances). Methods or use of proxies to allow for the denial of use is particularly challenging, requiring a comprehensive strategic approach. Deployed medical capability must expect to be targeted; this will constrain health care delivery and evacuation. There must be investment in protecting health care facilities and platforms with experimentation of tactics, techniques and procedures for operating without the protection under the Geneva Conventions.

2.7. **Contested space, and cyber and electromagnetic domains.** Contested and crowded cyber and electromagnetic, and space domains impacts medical usage of electronic and satellite means of communication, data capture, navigation and decision support. Medical information, particularly diagnostic images, is demanding of bandwidth to transmit. Defence (and medical)

1 This includes the national health services of the four nations of the UK.

information systems must be resilient and protected from attack. This includes protecting personal information which can be very damaging if lost, stolen or corrupted. Digitisation is essential to optimise health care of the future, but knowledge and training in reversionary methods must continue alongside technological advancements so that operational activity is not affected by hostile or self-imposed emission control.

2.8. **Proxies, partners and allies.** The operating environment is complex with a multitude of actors across a spectrum from cooperative to hostile, including state and non-state militaries, violent extremist organisations, international organisations, commercial industries, local population and organised crime networks. Actors may switch allegiances rapidly, forming partnerships and proxy relationships of significance. Defence must be adept at identifying actors, their contribution to the operating context and building advantageous relationships.

Population at risk

2.9. **Increased burden of chronic disease.** A continuous campaign of operating activity is likely to mean more Defence personnel will be operating more of the time, with less time to recover from injuries or ill health. A more technical force, and a requirement for experienced personnel, could also mean personnel serve and deploy later in life, increasing acquired health conditions. Defence personnel might need to be deployed at greater individual medical risk increasing the need for primary health care to be available. The DMS must support commanders in understanding and managing the medical risk, through a well-resourced Defence occupational health service. Strategic base health services (such as Defence Primary Health Care) play a critical role in improving, maintaining and restoring the health of the whole force. The blurring of home and away equally applies to the DMS: the health care system must be well-resourced across the homeland as well as on operations to deliver an effective end-to-end service.

2.10. **Exposure to hazards.** Operating across a geographic footprint will expose Defence personnel to a wide range of health threats including endemic diseases, environmental hazards and extreme temperatures. Densely populated urban areas can bring increased exposure to diseases and pollution, particularly where infrastructure is weak or damaged. Defence must take an 'all-hazards' approach and meet a high demand for environment health and force health protection capability to protect personnel and prevent disease and non-battle injury. Force health protection measures, including

timely immunisations and prophylactic medication, may be more challenging when preparing small force elements for activities across the operate function. Commanders and individuals also have a responsibility to prevent injury and illness and should be able to undertake a reasonable degree of self-care to reduce burden on deployed medical capability. This will require front line commands to ensure their personnel receive adequate health education and training appropriate to the deployed situation.

2.11. **Dependants and civilian personnel.** Greater global dispersion, growth of international engagement and contracted solutions could increase the overseas population of entitled civilians. Civilian personnel are likely to have additional health needs to the uniformed population, and this will need to be provided or arranged.

2.12. **Vulnerable groups.** Complex environments (including crisis responses such as non-combatant evacuation, and humanitarian assistance and disaster relief operations) increases the presence of vulnerable groups that may seek emergency medical care not normally within the skills and resources of deployed military health care (paediatrics, geriatrics and obstetrics). Defence must consider how it will address this uncertain burden; possible approaches could be agreements with the NHS or international organisations to deploy specialists, contracted services, increased resourcing of military specialist capability and baseline training for all DMS personnel.

2.13. **Mental well-being.** Operating in complex, uncertain and unsafe environments, and deploying more frequently, puts pressure on the mental well-being of Defence personnel. Those operating at reach and in small teams may feel they are at the limits of their training and experience. Personnel, particularly health care personnel, may find it challenging to operate in an environment where there is a high burden of unmet humanitarian need. These conditions may make moral injury a risk for Defence personnel. It is essential that good mental well-being and mental health care support, including when deployed, is a priority for commanders.

Operational patient care pathways

2.14. The operational patient care pathway (OPCP) is a planned pathway of care in place for all operational activity, from point of injury (or acute medical emergency) through to Role 4 (typically within the homeland). Patient outcomes are considerably improved the quicker from point of injury that levels

of care can be provided; delays to the timings carry clinical risk for the patient. Challenges introduced to meeting timelines include the following factors.

a. **Small forces and operating at reach.** Timelines will be stretched when operating over extended geographical distances. This may be due to global dispersion (operating in the Indo-Pacific or High North) or the forward deployment of force elements. It is challenging to get appropriate medical support forward to those force elements. Small forces may have minimal support, raising the requirement for greater self-sufficiency.

b. **Volatile, non-, or semi-permissive environments.** The DMS will be increasingly relied upon to deliver medical support in areas where it is not deemed safe for other providers to operate due to violence or hazards. Free movement by air, sea or land may be denied by adversaries or other factors and this could constrain or delay medical evacuation (MEDEVAC). It may be necessary to deliver medical support in a discreet/covert manner; this introduces constraints to the medical solution.

c. **Urban or remote environments.** The environment will introduce various pressures, such as restricting vehicle usage or access to water and power, climate control or presence of hazards (including industrial, natural or hostile chemical, biological, radiological and nuclear hazards). Urban operations will require enhanced medical support provision to match casualty demand. Urban casualty extraction and urban manoeuvrability will be core skills. Overcoming extreme conditions will be challenging and require modified approaches and novel solutions.

2.15. These challenges form the contextual backdrop for the proposed ways that medical capability can be optimised for operating. This is explored in Chapter 3.

Key points

- The health care environment is competitive, impacting procurement, supply lines and workforce resource. Defence will need to keep pace with the advancement of competitors who may be less constrained by medical law and ethics.
- The operating environment will vary according to task, but may be highly hazardous, hostile and complex. Disregard for rules and law, including the Geneva Conventions, may lead to targeting of medical personnel, vehicles and facilities.
- Defence personnel might need to be deployed at greater medical risk and could be exposed to a wide range of less familiar health threats, leading to higher presentation of disease and non-battle injury in the deployed population.
- Vulnerable groups within the local civilian population may present to military health care facilities with health needs that are beyond the typical capabilities provided.
- Delivering operational patient care pathways to multiple, small, dispersed and forward force elements will be difficult and may exceed clinical planning guidelines.

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Chapter 3

Optimising medical support to the operate function

Chapter 3 explores ways to optimise medical support across the Integrated Operating Framework. The chapter considers the development of medical capability to make efficient use of resources and enhance operational patient care pathways. It looks at priority areas for innovation and technology and highlights the importance of the medical workforce.

Enhance medical risk assessment and planning

3.1. Optimising medical support to the operate function will require accurate assessment of medical risk for input to operational planning and the development of a medical plan to support the activity. Activities along the operate spectrum will carry differing levels of medical risk based on threats, the nature and location of activity and the opportunity to mitigate the risk through medical support. Medical risk assessment and planning can be enhanced by the following.

a. Improving the professional education and through-career progression of medical planners and Competent Medical Authority (CMA) advisers.[2]

b. Adequately resourcing medical recce and ensuring Defence Medical Services (DMS) planners are trained to assess host, partner nation and civilian health care services that might be used.

c. Developing shared (Defence, national and international) sources of reliable data on casualty rates, endemic diseases, health care systems and previous Defence medical plans and risk assessments. The use of technology, including for example, artificial intelligence and machine learning, to manage data and support medical planning must be explored to facilitate the process more efficiently.

2 The CMA construct will be vital to give scrutiny and assurance to plans and advise chain of command decisions. See Joint Service Publication 950, *Medical Policy*, Leaflet 5-2-8 for more information about the CMA.

d. Optimising the use of medical intelligence (MEDINT). MEDINT is vital to: identify and understand threats; understand the status of relevant national and military health care systems; and inform medical risk assessments and decision-making. Strong linkages and sharing of intelligence with allies and partners will be necessary, particularly where operating over a dispersed footprint. Technology must be at the forefront of developing and exploiting MEDINT.

e. Using organisational learning as a tool to better inform planning of operating activity. DMS needs to learn lessons from allies, partners and the medical activities of others, including adversaries, as well as learning from internal operations and exercises.

f. Improving communication of medical risk to commanders supported by quantifiable metrics. Data, research and an ongoing commitment to refining casualty estimation and risk assessment methods in all environments and operating methods.

Shape agile medical solutions

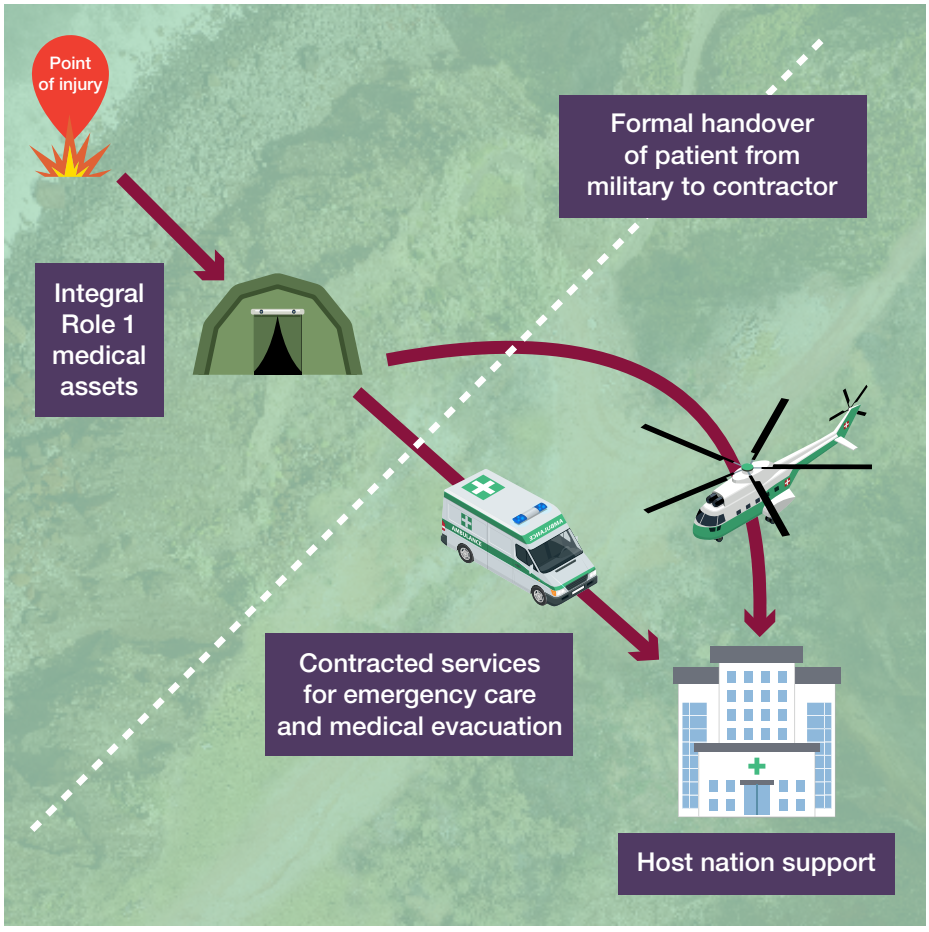
3.2. **Network operational patient care pathways.** Efficiencies in operational patient care pathway (OPCP) delivery can be made by more intelligent networking of OPCP that cross domains and geographical areas. The command, control, communication, computers and information (C4I) for medical support to operating activity will need to be coordinated across the operational commands with efficient integrated use and interaction between assets to fulfil end-to-end patient care. The DMS is already an exemplar of joint working, however, further integration for advantage can be made to optimise command and control across globally networked OPCPs.

3.3. **Outsource low-risk parts of the operational patient care pathway.** In designing medical support solutions, medical planners need more flexible options that can be tailored for the situation and risk pinch-points. Contracting elements of the OPCP and use of trusted host nation, partner military and civilian organisations will give planners more opportunity to conserve military medical capability for the highest risk activities. It will be necessary to efficiently assess and assure services, so the risks are understood. For example, a host nation health system may be less established and carry high levels of hospital-based infection. Scenario 1 details an example where outsourcing is used.

Scenario 1: Part of the operational patient care pathway is outsourced

Scenario. The UK has committed a battlegroup to join a multinational forward presence. This deployment is part of a continuous commitment to provide security to a region in a state of political tension and at risk of escalation towards conflict.

Operational patient care pathway. Role 1 pre-hospital emergency care (PHEC) and primary health care is provided by the unit. Expected trauma casualty rates are low. Therefore, beyond Role 1, there are no further military assets deployed. Arrangements are in place for further care to be delivered by an international contractor and the host nation. An ambulance exchange point has been agreed where a patient will be transferred into the care of the contracted health care provider. A civilian ambulance or air ambulance will then take a casualty to the most suitable host nation medical treatment facility.



Opportunities. This arrangement avoids the need to commit military medical capability to a persistent engagement activity where the assessed risk of casualties is low. This helps free capability for other activities and avoids clinicians experiencing skill-fade on 'low-exposure' deployments. If the situation becomes more kinetic, further medical assets could be deployed to the region to scale up the forward presence.

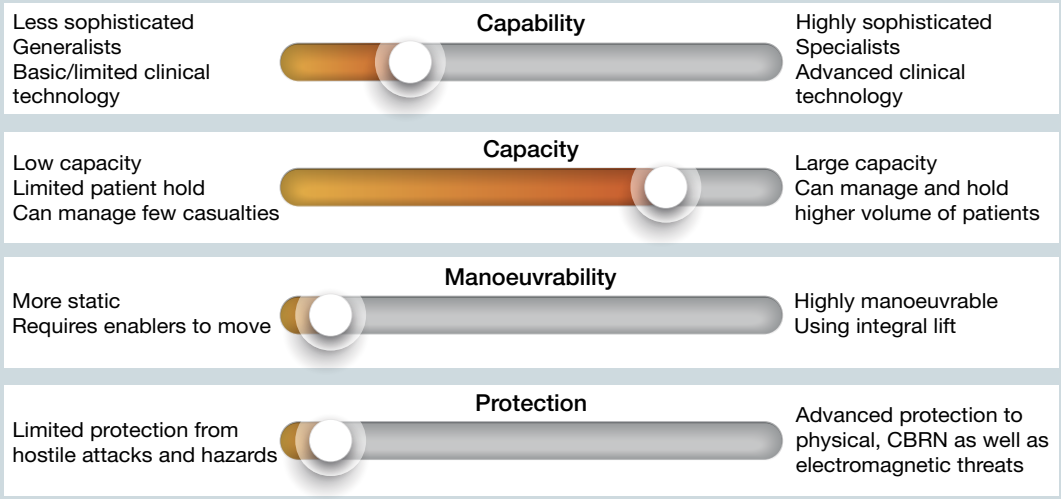
Constraints. Reliance of third parties requires measures to assure the services and facilities used. Thorough and ongoing recce and assurance activity by both the DMS and the contractor must in be place. Host nation and civilian services may not always be suitable or available. This is appropriate only for very low casualty numbers and is akin to having travel insurance in place for unexpected events. Agreements regarding handover and responsibility for the casualty must be well understood by all parties. Commercial expertise must be improved to get timely and effective agreements in place.

Balance capability, capacity and manoeuvrability

3.4. Operate activity will be varied and so will require the correct mix of capability and capacity tailored to the expected casualty profile and volume (rate). Lower risk engagement tasks will likely have a low threat of serious trauma but may have a higher burden of disease and non-battle injury. More kinetic constrain activity, such as special operations, will likely have an increased risk of serious trauma, requiring highly skilled trauma capability. Capability and capacity must also be balanced against manoeuvrability as a significant increase in either parameter will increase the footprint and lift requirement of a facility. Small, rapidly manoeuvring force elements will need comparably manoeuvrable facilities if they are to stay within range. The requirement for physical protection of medical capability is a further consideration and should be variable to the situation. Figure 3.1 gives examples for how these parameters might be balanced differently for different operate activities.

Example persistent engagement activity

This activity might involve larger units training with partners overseas for extended periods. Personnel might be at increased risk of disease and non-battle injury from the environmental conditions. Medical capability should be geared towards primary care and more generalised emergency care and, where possible, support recovery in theatre so personnel can return to duty.



Example constrain activity

This activity might involve small teams operating over extended distances and at high risk of being attacked. Priority should be given to manoeuvrable, protected medical capability that can keep within range of the team and offer a high level of emergency care in the event of a serious trauma incident.

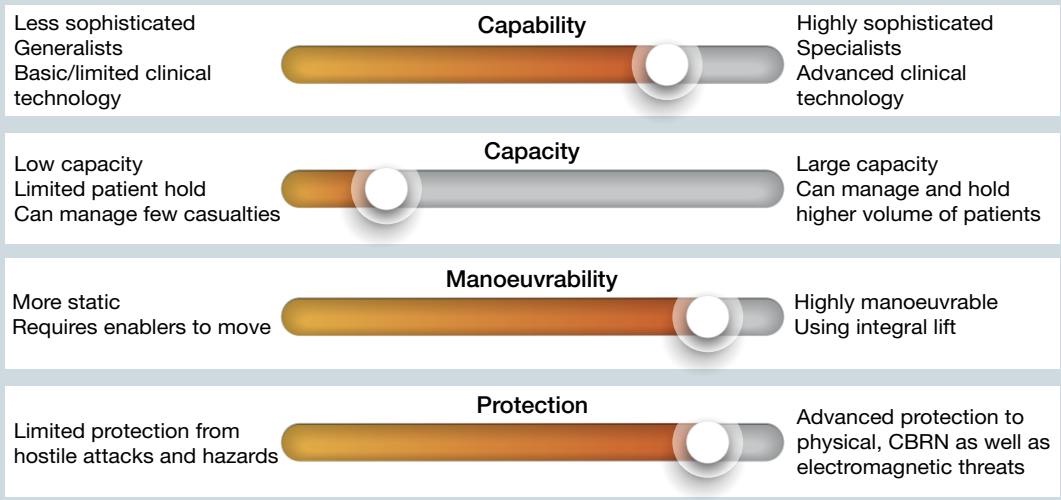


Figure 3.1 – Balancing capability attributes for different activities

3.5. **Flexible capability options.** Achieving the correct balance of capability for a task requires the opportunity to tailor medical support packages to the task. The options are described below.

a. **Modular and multitasking.** A smart, modular system allows planners to 'pull modules from the shelf' to build a bespoke package of clinical capability that fits the requirement with minimal waste. To maximise available capability, modules should have utility across operational domains and be interoperable as part of a modular medical treatment facility with allies and partners. Defence must work in partnership with industry to emphasise the demand for a simple, intuitive and multitasking inventory of equipment.

b. **Scalable.** Agile medical capability will be able to scale up or down to fulfil a range of tasks and respond to changing operational situations. This is particularly key for Role 2 deployed hospital care (DHC). Role 2 facilities currently range from small and agile Role 2 forward (R2F) up to a very capable but less manoeuvrable Role 2 enhanced (R2E) facility. The Integrated Operating Framework (IOF) demand will be for smaller facilities to support operate activities but without loss of the ability to deploy larger DHC facilities in support of warfighting activities. The 'building blocks' of DHC should therefore be optimised to enable a completely scalable system, based on the smallest viable facility, that can seamlessly aggregate (bolt together) or grow to meet a higher demand as required. Adjustment of existing medical modules and investment in new equipment will be necessary to achieve this.

c. **Responsive.** The advantages of scalable, modular capability are only realised if it is possible to respond to a changing requirement at a speed of relevance. Projecting capability may be aided through forward positioning at global hubs or using persistent engagement as an opportunity to locate capability for subsequent surge to an emerging crisis. Responding to changing situations requires agile medical C4I to pivot coherent plans whilst maintaining clear CMA responsibility.

d. **Resilient.** Operating in challenging environments, at reach and at a tempo that offers little redundancy, means it is vital that all medical operational capability is resilient. The DMS should be able to operate even where there are chemical, biological, radiological and nuclear (CBRN) hazards, extreme weather conditions, variable light conditions and so on. Resilience must be considered throughout force development and be

built into equipment and operating procedures. There must be variable options for protected platforms and facilities.

Supporting forward force elements and extended timelines

3.6. **Push more life-saving interventions towards point of injury.** Research supports that the greatest mortality occurs in the PHEC segment of the OPCP between point of injury and arrival at DHC; most of this mortality is due to haemorrhage. Positive patient outcomes for challenging OPCPs can only be achieved if the 'front end' (as close to point of injury as possible) is loaded with sufficient capability for immediate life-saving interventions, such as effective haemorrhage control, forward blood products and immediate therapy medical countermeasures (MedCM). Small teams, over extended distances, must be better equipped to provide immediate life-saving interventions. Ways to optimise this are as follows.

a. Uplifting the skills of all personnel, especially those deployed far forward, including enhanced first aid for non-health care personnel and equipping them with effective forward deployed MedCM. This approach would need to be paired with reliable wearable technology so medical personnel can oversee the casualty status and responded effectively.

b. Investment in quality, mandatory basic first aid for all personnel across all Services could have a positive impact on operational mortality; cost-benefit research should be conducted.

c. Empowering non-vocational medics (such as team medics and remote medics) and military medics by giving them scope to employ more advanced interventions. This might be enabling them to carry effective and safe operational MedCM (such as tranexamic acid, battlefield analgesia, antibiotics and antidotes).

d. Providing robust decision support tools, forward diagnostics and real time casualty monitoring to aid rapid clinical interventions.

e. Developing closer linkages between primary care and PHEC personnel within the OPCP to improve holistic patient care and outcomes.

f. Seeking innovations and advancement in PHEC. This must be a high priority as the likely area where greatest advancements can be made in patient outcomes over the next 10 years.

g. Prolonged casualty care (PCC)[3] becomes necessary when evacuation is delayed. Effective PCC can improve patient outcomes, but to support it requires resourced uplift to training for the acute or emergency care personnel that will need to deliver it.

3.7. **Provide timely damage control resuscitation and surgery.** Force elements at higher risk operating over extended distances may need to be supported by a small and agile DHC facility that will enable damage control resuscitation/surgery to be delivered within planning timelines. Scenario 2 provides an example of where a R2F may provide this effect. Facilities that can provide this effect, such as a R2F, will have little or no patient hold capacity. Tactical evacuation[4] must therefore be in place to rapidly clear patients away from the facility. This will constrain operational utility, and so whilst there is a rising trend for small R2 facilities, this will not be an appropriate approach in all cases.

Scenario 2: Extended timelines mitigated with small agile capability

Scenario. The UK has sent a long-range recce patrol into an increasingly insecure country to help disrupt activity by a violent extremist organisation. The patrol operates over an extended distance of almost 400 kilometres. It is a volatile and high threat environment.

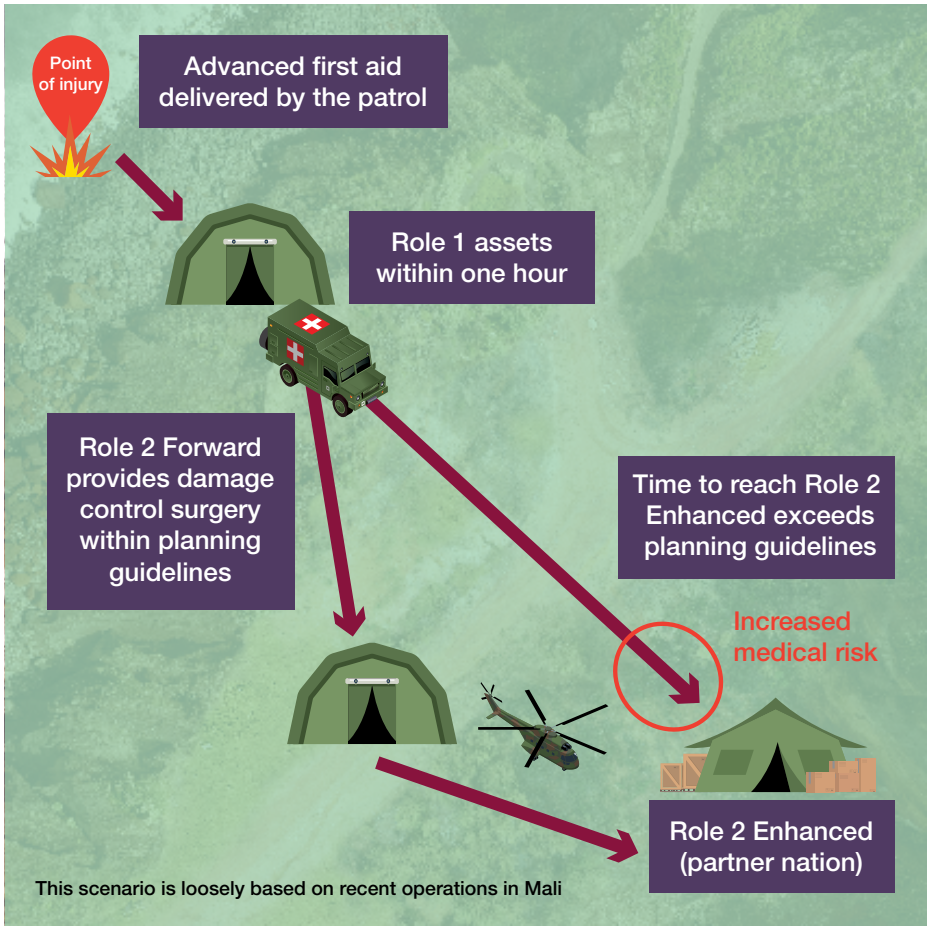
Operational patient care pathway. The patrol has upskilled medics that can deliver a high level of first aid within the first ten minutes of an incident. The Role 1 pre-hospital treatment team is highly manoeuvrable to keep within good range of the patrol. However, due to the geographical distance of the patrol, the time to reach the Role 2 exceeds the planning guideline of two hours to damage control resuscitation/surgery. A R2F surgical capability is deployed to mitigate the extended distance and can provide damage control surgery sooner, reducing the medical risk.

Opportunities. The R2F helps to reduce the risk of the extended timelines by ensuring that damage control surgery can be provided more quickly and reduce the risk of mortality associated with delay.

3 This term, intended to be more reflective of all operational domains, has been submitted for the North Atlantic Treaty Organization (NATO) Terminology Office approval. PCC includes prolonged field care.
4 Tactical evacuation is the transfer of patients between DHC facilities.

Constraints. This R2F is very small and limited in capability and has no hold capacity. It is essential that the evacuation assets are in place to clear the facility rapidly and get the patient into a R2E/3. The R2F cannot sustain itself for long and is highly dependent on efficient resupply. It is important that the addition of forward surgery to an OPCP does not introduce a delay in the overall care of the patient.

Other novel options such as in-transit surgery could be explored for similar scenarios.



3.8. **Support increased disease and non-battle injury burden.** Where disease and non-battle injury rates are expected to be high, deployed teams and facilities must have the necessary mix of skilled health care personnel, including physicians, general practitioners, dental, physio, mental health teams,[5] plus diagnostic support and adequate ward capacity. Where resource

5 Forward mental health care provision can liaise with commanders to support primary prevention and provide a low risk treat capability in theatre.

or deployed headroom constrains the permanent forward deployment of primary health care, peripatetic services could be valuable. Primary health care services might be projected from larger facilities or global hubs; and experimentation of how to deliver this most effectively from global hubs or overseas bases should be undertaken. Basic health, hygiene and first aid skills for all deployed personnel is of high importance and training requirements should be reviewed by the appropriate authorities to ensure validity for operating environments. Defence innovations in human performance and wearable technologies may help to protect the force but should be explored with medical input to ensure there are no adverse effects on the user.

3.9. **Project clinical expertise and supervision forward with telemedicine.** Forward or dispersed medical (or non-medical) force elements can be supported by telemedicine through reachback (or reach anywhere) for command or clinical advice. Being able to access remote advice and supervision for procedures or situations where they do not have experience or expertise, enhances the capability of more isolated personnel. Telemedicine technologies and innovation have been demonstrated on recent operations to gain subject matter expert advice for decision support or provide real time clinical support (see Scenario 3 for an example of how real time clinical support can be used). However, these technologies have constraints such as satellite communication availability, bandwidth and sustainable access to subject matter experts (very small cadres cannot support operations continuously).

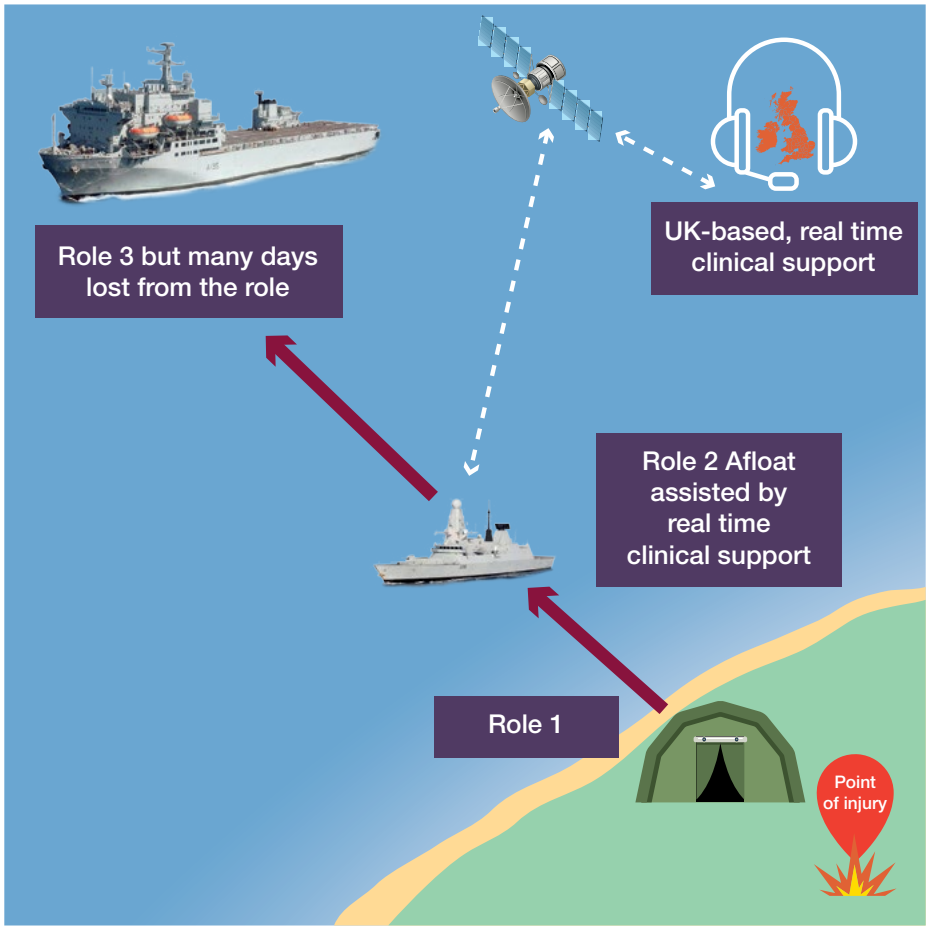
Scenario 3: Use of telemedicine to support forward elements

Scenario. A small littoral force is deployed in a remote area. Battle casualty replacements are difficult, so any loss from the small team has a big impact on operational effectiveness. An individual sustains an injury that requires specialist eye surgery review at the Role 3 hospital ship, however this means they would be lost from their role for several days.

Operational patient care pathway. The mitigation for this travel time to the Role 3 is the placement of a Role 2 afloat. The Role 2 has two experienced surgeons, but neither have the specific eye surgery skills needed. Using real time clinical support, a specialist remotely guides the Role 2 surgeons through examination of the eye with real time high definition video link, enabling specialist assessment at the forward location and avoiding the need for a slow and potentially dangerous transfer to Role 3.

Opportunities. Real time clinical support may in some circumstances enable more specialist assessment and procedures to be performed further forward through remote clinical supervision. This can enhance the range of care provided at forward medical treatment facilities and help to maintain the operational effectiveness of small force elements.

Constraints. The use of real time clinical support is reliant on a strong and reliable data feed via satellite and this may not always be achievable via secure military communication and information systems (CIS) capability. There may be security implications and restrictions (for example, electronic signatures and using satellites hosted by near-peers). It is also necessary for the relevant specialist to be available to support the activity. For very small specialty cadres, the ability to facilitate real time clinical support and other forms of reachback advice at short notice could be problematic.



Enhance medical evacuation

3.10. Timely medical evacuation (MEDEVAC) will require platforms that are appropriate to the situation. Hostile and contested areas may necessitate protected platforms which are less vulnerable to hazards and attack and are better able to safely evacuate patients from high threat areas. Commitment must also be made to support the equipment and training for urban evacuation.

3.11. **Remotely operated and autonomous.** Technology is rapidly increasing the development of unmanned, autonomous and remotely operated platforms, which could potentially open options for their use for evacuating casualties.[6] This could bring several advantages such as reducing the need to expose crews and increasing platform availability. However, further research and development is required to exploit this technology for medical purposes and to ensure all evacuations are safe and ethical.

3.12. **In-transit intervention.** Innovations should also be explored that could allow for continued interventions whilst in-transit. This would help to reduce delays in receiving care, for example, in-flight surgery.

3.13. **Patient tracking.** Managing patient flow and tracking patients through the end-to-end system will be complex if multiple interconnected pathways are in use, including host nation or civilian treatment facilities. The UK should be able to align with international digitised patient flow systems, such as the system being developed by the North Atlantic Treaty Organization (NATO), where possible.

Build resilient medical supply/reverse supply chains

3.14. Resilient sustainment of the IOF presents challenges including: supplying a wide global footprint; resupplying; removing waste from very small facilities such as the R2F; getting products that need cold chain storage such as blood products and drugs to forward austere locations; and securing reliable supplies within a competitive international market. Approaches to be considered include the following.

6 NATO has proposed the term RASEVAC, which is the evacuation of wounded, sick and injured personnel using robotic, autonomous and/or unmanned air, ground or maritime platforms with or without a human attendant and/or autonomous en route medical systems.

a. **Forward logistics hubs.** Timely resupply to multiple, distant and remote locations can be mitigated by using forward hubs from which to distribute. Global hubs could also be used to create an efficient way of meeting servicing schedules for electromedical equipment in more distant regions.

b. **Strategic stockpiling.** Stockpiles of medical supplies that may be required by multiple nations or government departments can be contributed to and maintained through burden-sharing agreements. Increasing self-sufficiency through sovereign manufacturing capability would decrease reliance on global suppliers.

c. **Intelligent resupply.** Intelligent, or precision, resupply systems which use data to move only what is needed, would reduce waste, save space on the delivery platform and reduce burden on the supply chain. For example, the system could use data to identify the clinical procedures undertaken for a given patient and resupply only those specific items rather than replacing a full medical module. Those items could be delivered by the evacuation team as the patient is collected.

d. **Remote resupply.** The use of drones to resupply is likely to be part of an agile approach to supporting medical treatment facilities in remote or hostile locations.

e. **Enhancing portability.** Lighter, smaller, more robust and more easily transportable items increase the ease with which they can be moved as required. Technologies that reliably transport cold chain items to forward locations must be developed.

f. **Innovative products that reduce logistic burden.** Products that are stable (particularly in terms of temperature storage) and robust reduce the burden on the supply chain. Products that can be more easily distributed to, or manufactured at, forward and remote areas, especially those that enhance survival such as blood products, diagnostics and MedCM, must be an area of ongoing innovation and agile procurement. Innovative, lightweight, portable technology for sterilisation and clinical waste management at forward locations could reduce the burden on the reverse medical supply chain.

Optimise the workforce

3.15. **Whole force approach.** Available medical workforce is a key constraint in meeting increased demand. The DMS must take a whole force approach to make efficient use of all Regular, Reserve and Civil Service DMS personnel, and draw upon alternative workforce sources for lower risk activity (for example, from civilian national workforce pools).

3.16. **Skill mix.** Operate activities will often demand smaller medical elements with constrained numbers in the team. This will make it necessary to carefully balance the composition of that team, for example, surgical specialities, and balance between trauma care and emergency medicine. Most clinical disciplines follow national training pipelines and there is a trend for training to become increasingly specialised. This is a concern for military health care personnel who are better served by a broad or 'generalist' skill set to meet unexpected challenges on operations. The DMS must define core military skill sets to ensure deployed teams are prepared. It may be necessary in future to have increased oversight of military medical training and, in some cases, dedicated military medical training pathways.

3.17. **Experience and currency.** Maintaining currency of skills is essential for all professions and disciplines including non-clinical cadres, not just to maintain a high standard of performance, but also to enhance personal and professional satisfaction. If personnel are deployed more frequently on low-exposure activities the risk of skill fade is increased. Opportunities to gain experience and maintain currency must be sought in novel ways. Building relationships across government and internationally may create more opportunities for secondments and placements. Technological solutions may go some way to mitigate skill fade on operations but cannot substitute for real life experience (at present).

3.18. **Expeditionary mindset and skills.** Operating in austere conditions, over extended timelines and with limited access to senior clinical advice, requires enhanced skills to deliver care in unexpected, unfamiliar and pressured scenarios. The expeditionary mindset enables medical personnel to react effectively to situations far beyond their normal clinical experience and be flexible to operate from any platform. Selection of individuals with the right character for a role is needed, but skills can be enhanced through upskilling, training and the sharing of experience by seasoned military medical personnel.

3.19. **Military medical training.** Adequately preparing all military health care personnel for operating might be achieved through a bespoke military medical

foundation programme that covers aspects of health care not covered in civilian medical training (covering military medical ethics, major incidents, advanced trauma life support, CBRN, travel and tropical medicine, basic sports medicine and human security). This would require considerable enduring investment so a cost-benefit analysis should be undertaken.

3.20. **Pre-deployment training and validation.** With the continuous nature of operating, Defence will need to move away from a linear approach to preparing for deployment and find efficient ways for training and validation activity to be conducted. For medical teams this may be to use a centralised system to credit and record the achievement of competencies that are relevant to multiple IOF activities. Training and testing must be rationalised to essential content, conducted in minimum time, with maximum duration of validity so that clinical personnel need minimum time away from clinical work.

3.21. **Moral injury and ethical decision-making.** Operating in complex environments below the threshold of warfighting will present morally ambiguous situations for medical personnel. Decision-making will be challenging and there may be an increased risk of moral injury. Ongoing development of decision support tools, organisational learning and development of military medical ethics training will be essential.

Promote technical advancement

3.22. **Digitisation and data exploitation.** Aggressive exploitation of data to change clinical practices was the principal reason for serial improvements in patient outcomes throughout combat operations in Iraq and Afghanistan and will be the principal reason in the future. Patient outcomes are the measure of effectiveness for successful delivery of medical support to the IOF. Robust and standardised operational data must be collected and be the driver for continuous quality improvement. Enhanced digitisation offers opportunities to: collate data centrally more quickly and reliably; spot trends in emerging new injury or disease patterns; and spot poor performance to address in near real time. For expansive digitisation of medical capability, wider J6 branches need to understand the importance and demands of medical CIS and facilitate as part of the higher information exchange requirement.

3.23. **Research and innovation.** ‘Closing the sophistication gap’ has been coined to describe the need to try and better match the patient outcomes of small, forward medical treatment facilities with those achieved by large medical treatment facilities that are laden with clinical technology. This requires

innovative solutions for forward military usage that may be more lightweight, rugged and simple to use by less skilled operators. Innovations should be identified through well-funded research, experimentation and industry partnerships. Examples include blood products, medical gases, diagnostics and telemedicine. Innovations must span the Defence lines of development and not just focus on equipment. Historically, military medical advancements have been made during major campaigns. Defence must ensure steady funding for research and innovation whilst it is engaged in a campaign of continuous operating.

Maximise integration and engagement

3.24. **Cross-government.** The DMS must work closely across government, with the Foreign, Commonwealth and Development Office, Home Office and Department of Health and Social Care to ensure coherent delivery against the IOF. Efficiencies can be achieved through burden-sharing in areas such as research and development, training, mutual aid and building of strategic stockpiles notably MedCM. Mutual arrangements could be put in place for training delivery, mentoring and advice. Conversely, increased deployment of DMS personnel to support the IOF could place strain on the National Health Service, so employers of Reserves may be reluctant to release their employees more frequently. It is important that this interdependent relationship is carefully managed.

3.25. **Allies and partners.** Integration and strengthening of relationships with allies and partners, particularly NATO, the Joint Expeditionary Force and the Combined Joint Expeditionary Force, will grow in importance to deliver credible medical effect across the globe. Standardising capability for interoperability and training with allies is of great importance but can be resource intensive, so Defence must commit adequate resource to ensure it can work alongside partners to fulfil the breadth of requirements across the IOF.

3.26. **Industry and academia.** Gaining advantage against competitors requires Defence to stay at the leading edge of research and innovation. Close collaboration with national and international academic and professional institutions will drive comprehensive research programmes that benefit medical force development. Similarly, collaborative working with industry partners could lead to better pre-emptive technological innovation to meet emerging threats. Shaping industry progress in technologies for military medical applications will make it more likely that innovations can be exploited rapidly. Medical support to the IOF must be included in Defence industrial and science and technology strategies.

Key points

Optimised medical support to the IOF may be achieved through:

- enhanced medical intelligence, medical risk assessment and planning;
- options to support bespoke OPCPs and balanced medical capability that can meet the unique requirements of operating activity;
- life-saving interventions being pushed closer to the point of injury;
- innovations in medical capability that raise the sophistication of small forward medical treatment facilities;
- uplifted medical skills and empowerment across the whole force and finding innovative ways to support force elements operating forward or with minimal medical support;
- reshaped medical capability that is more agile, that can scale up and down, aggregate and partner as the situation dictates;
- enhanced medical C4I and decision support through technology;
- resilient equipment and resupply chains; and
- optimised medical workforce with training and sustainable conditions.

Chapter 4

Medical support to warfighting

Chapter 4 looks briefly at the challenges of delivering medical support to the whole continuum of the Integrated Operating Framework. The chapter considers the requirement to maintain credible medical support to warfighting and how this might be balanced with the delivery of medical support to operating activity.

4.1. The *Integrated Operating Concept* sets out how the operate functions of protect, engage and constrain must continue and may even amplify if there is a requirement to warfight. This compounds all the challenges in meeting demand that have been highlighted within this concept and emphasises the reasons for considering how and where to prioritise military medical capability and where to take increased risk.

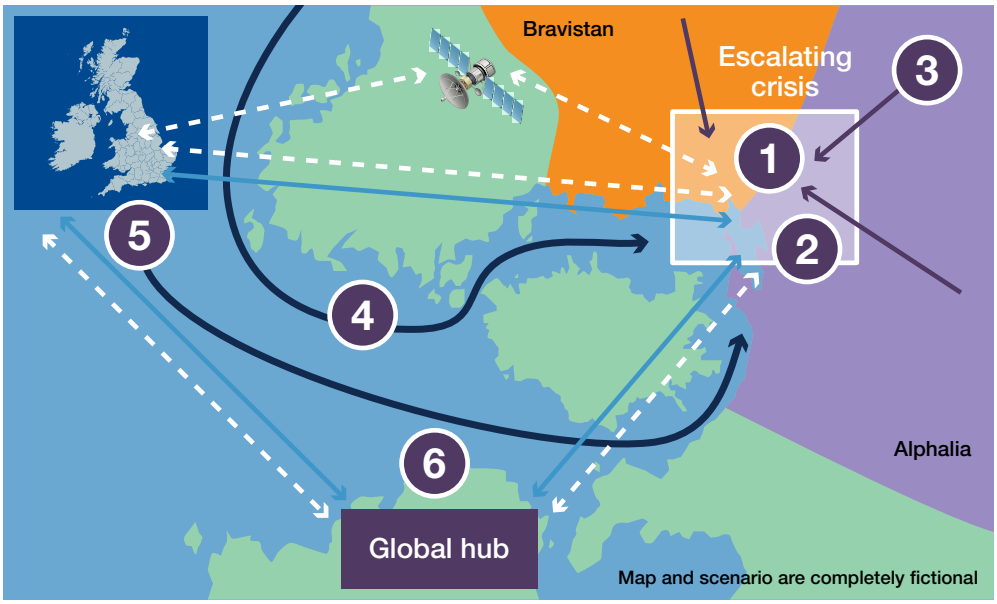
4.2. The Defence Medical Services (DMS) like many joint enablers, will need to reassess priorities and potentially re-aggregate some military medical capability from discretionary operate activities if the UK crosses the threshold into warfighting. Alternative arrangements would need to be put in place to ensure operating force elements are not without adequate medical provision. It will also be necessary to ensure an appropriate level of resource is aligned to contingency for warfighting.

4.3. Scenario 4 provides an example of how medical elements might be re-aggregated to build up the level of medical capability mass to support warfighting. It highlights the advantage of: interoperability across operational domains and partners; scalability of medical facilities; forward basing of medical supply; responsive force elements; and the utility of Reserve medical force elements for large scale operations.

Scenario 4: Aggregation of medical capability in support of major operations

This scenario considers how medical capability could be progressively aggregated to generate mass in support of an escalating situation.

Scenario. UK forces are delivering military training to partner nation Alphalia. Political tensions are rising with neighbouring Bravistan who claim ownership of border territory and are conducting increasingly hostile activity in Alphalia. The UK government pledges to assist Alphalia to de-escalate the emerging crisis and protect civilians. The in-situ training force elements join Alphalian troops in defensive patrols and casualty numbers are estimated to rise.



1 The training battlegroup has their own Role 1 assets and a Role 2 basic (R2B) deployed. Elsewhere in the region, a Role 2 forward (R2F) surgical capability is supporting special operations. It is relocated to join the R2B. The facilities are interoperable and work together as a larger R2B.

2 Swift evacuation of patients from the R2B facility is critical and air assets are deployed from a forward base to establish aeromedical evacuation capability. Some lower risk patients can be evacuated to a global hub operating base; more serious patients return to the UK for onward care in the National Health Service. As the scale of the operation increases, a hospital staging unit is set up.

3 A Role 2 enhanced (R2E) that has been conducting a multinational exercise in the region, is air-lifted to the crisis zone. As the new facility sets up, the R2B continues to receive casualties. The R2F splits away so it can be re-tasked to provide a forward surgical capability where timelines have become extended.

4 The R2E can be further scaled up to a larger configuration, but the uplift component must be delivered by sea or land, which takes time. The workforce uplift is primarily Reserve forces who are prepared for this scale of operation.

5 A Role 3 hospital ship is operating in the region and provides significant additional patient receiving capacity and alternative operational patient care pathway routes. As the crisis evolves into a multinational effort, the medical laydown will similarly need to grow to support the force. Medical capability must be interoperable with allied and partner nations to achieve effective care.

6 The use of a global hub and forward positioned assets enables timely resupply and electro-medical equipment support to sustain the operation. Satellite links reach back to the UK for specialist telemedicine support. Command, control, communication, computers and information is crucial to this complicated operational laydown, highlighting the importance of the cyber and electromagnetic domain, and communication and information systems capacity.

Summary. This fictional scenario depicts how the aggregation of medical capability could be approached. It shows how assets engaged on operating activities in the region could be re-tasked and scaled up to support the build-up of capability mass in the event of a major crisis.

The scenario highlights how success relies on integrating capability across operational domains. Medical capability must be agile and adaptable to pivot missions and tasks as required. Operating force elements must not be left unsupported; this must be part of any plan for escalating crises.

4.4. To maintain a credible ability to fulfil support to warfighting, medical force elements must take part in large scale Defence and international collective training exercises. Defence must maintain its commitment to allies and partners (notably the North Atlantic Treaty Organization, the Joint Expeditionary Force and the Combined Joint Expeditionary Force) including training and participation on multinational exercise series. This is expensive

to support and challenging to programme alongside operating commitments but is essential to maintain effective and credible capability. Collective training also provides opportunity to experiment, often missed due to focus on validation of established systems and organisations. There are many areas of warfighting that require further exploration, including patient flow management and strategic evacuation of mass casualties. Collective training will provide opportunities to develop in these areas.

4.5. Interoperability with allies and partners will be key. The DMS must develop its ability to contribute to multinational modular medical treatment facilities to create large scale medical effect and should take a leading role in driving standardisation and interoperability across nations.

Key points

- Medical support to major operations, including warfighting, will require considerable health care resource (both deployed and in the homeland).
- Some medical operational capability may need to be re-aggregated from discretionary operating activity to support the build-up of mass.
- A warfighting response will require the integration of the whole force, and collaboration and interoperability with national and international allies and partners.
- The challenges of managing significant casualties from warfighting are vast and must be the subject of further experimentation and development.

Notes

Chapter 5

Medical operating advantage

Chapter 5 explores the potential for medical activity to contribute to operating advantage. The concept looks beyond the provision of quality medical support to deployed personnel to consider additional ways that medical assets might have an effect.

5.1. Medical operating advantage is the achievement of direct operational advantage through medical activity. Advantage will be gained by optimisation of medical support that best enables very challenging operating activity (such as far forward force elements), as discussed throughout this concept. Operating advantage may also be achieved directly from medical activities. Some possible approaches are considered here.

Building and reinforcing strategic relationships

5.2. Defence health care engagement (DHE) (also known as global health engagement) encompasses a range of activities such as academic collaboration, or training with international partners, alliances and organisations. DHE can provide advantage by forging positive professional relationships: medical personnel may be able to use professional forums to build links with nations or organisations that are typically difficult to access through military means. DHE opportunities can be used to influence health narratives such as key World Health Organization messages, particularly in areas of health security threats. DHE activity must be consistent with strategic messaging and personnel must be trained so they do it correctly.

Strengthening medical services

5.3. DHE may involve strengthening a nation's resilience to health threats through capability/capacity building or by providing medical training to build the host nation health service. This might give an advantage in regions where we plan to use host nation health services as part of the operational patient care pathway. Training should still be designed to be appropriate, authorised and delivered by individuals who have both clinical and educational skills. The

DMS must properly train its own medical educators. Strengthening of health services can also be applied to our own national health services. There are plenty of recent examples, such as Operation Rescript, indicating potential future ways that medical capability can strengthen and support the homeland through medical military aid to the civil authorities.

Identifying, attributing and countering health threats

5.4. Health security threats feature highly on the national security risk register and the DMS makes a prominent contribution in this sub-threshold space. Military medical specialist capabilities can identify, aid with attribution and provide a counter capability. Specialist capability is held within chemical, biological, radiological and nuclear medical, medical intelligence, infectious diseases, pathology, aviation medicine/physiology and environmental health. Niche military medical capabilities must be protected and invested in to ensure we can identify and respond effectively to health security incidents. Training alongside civilian organisations and agencies is advantageous for all parties. In addition to integral medical expertise, the DMS must grow its collaboration with the UK Health Security Agency (the national executive agency, sponsored by the Department of Health and Social Care, that prepares for and responds to external health threats such as pandemics).

Winning the narrative

5.5. In an era of sub-threshold competition, there is advantage to be gained (or lost) by being seen to do the 'right thing' in the eyes of the public and international community. Advantage can be gained by projecting a positive but truthful narrative: delivering health care to those in need is a classic 'good news story'. However, the DMS is not itself a humanitarian medical organisation and is rarely better placed to care for affected local populations than trained and equipped humanitarian organisations or the host nation. There must be a cautious approach to projecting military medical capability for purposes beyond the primary role of supporting the Defence population at risk. Where a crisis requires niche expertise from within the DMS, such as infectious diseases, there may be greater justification for involvement. In any supported humanitarian assistance and disaster relief operation the DMS will also be prepared to provide life-saving care to the affected population in extremis and within its resource and will handover to more appropriate medical services as soon as practicable. Defence must be wary of potential for negative spin and misinformation about failing to provide adequate care. Media

training for DMS personnel, with greater emphasis on getting ahead of the narrative, is essential to compete in this space.

5.6. Medical operating advantage is an area that warrants further concept work. This is required to expand approaches to using medical capability to achieve advantage without crossing tolerable ethical boundaries.

Key points

- Medical activity can deliver direct operating advantage and contribute to the achievement of strategic and operational objectives.
- Medical operating advantage may be achieved through:
  - strategic relationship building with medical partners;
  - strengthening the medical services of host or partner nations;
  - identifying, attributing and countering hostile attacks on health security; and
  - promoting a positive narrative of 'doing the right thing'.
- The use of medical activity to gain advantage must be judicious and keep within acceptable ethical boundaries.

Chapter 6

Conclusions and recommendations

Chapter 6 pulls together the key conclusions of this concept. It sets out recommendations to force developers, policy-makers and senior leadership for how to optimise medical capability in support of the Integrated Operating Framework.

6.1. The changing character of conflict has prompted a shift in Defence posture and the Defence Medical Services (DMS) must align to the Integrated Operating Framework (IOF). The DMS will contribute to the IOF in three ways.

a. **Medical support to the operate function.** Operating will require more DMS capability to be deployed more of the time to support multiple, smaller, globally dispersed, varied operating activities, such as persistent engagement.

b. **Medical support to warfighting.** The DMS will need to retain an ability to support warfighting as well as operate activities. This could require the aggregation of medical capability to generate mass, so capability should be shaped to facilitate this approach. Interoperability with partners and allies will be critical and opportunities to train and develop with them must be prioritised and resourced.

c. **Medical operating advantage.** Medical activity can be used for direct operational effect and to gain advantage. This approach should be explored and expanded to understand how to gain advantage without exceeding professional and ethical boundaries.

6.2. Supporting all the activity of the IOF represents an increase in demand for medical support within an increasingly challenging context. Resources are constrained and vulnerable due to global competition. The operating environment will be varied, and personnel may be exposed to extreme environmental conditions, hazards, hostile attack, diseases, and restrictions such as a contested cyberspace and electromagnetic spectrum. Providing

medical support may entail the provision of multiple, extended and difficult operational patient care pathways (OPCPs).

6.3. To meet the increased demand, in challenging operational conditions and within the constrained overall headroom of Integrated Force 2030, there will be a need to make decisions based on risk. Commanders must understand the medical risk that is associated with every operational activity and the IOF campaign approach. The risk appetite of senior leaders to sustain casualties must be clearly articulated.

6.4. Approaches to ensure the IOF is supportable might be to tolerate more medical risk in some situations, or to rationalise expectations of the safe and acceptable standard of care that can realistically be provided in all operational situations. Some operating activity may need to be supported in alternative ways (such as outsourcing) so that military medical capability can be prioritised for higher risk activity. Medical capability should be optimised to best support the IOF and it is recommended that this is achieved in the following ways.

a. Enhance medical risk assessment, recce and planning with enhanced used of centralised and shared data sources. Grow medical planning and competent medical authority expertise within the DMS to optimise the advice given to commanders.

b. Shape medical capability to enable bespoke medical support packages and OPCPs adaptable to all IOF tasks. Agile capability that is scalable, modular, multitasking, responsive and resilient will be most efficient in meeting the varying demands. Procurement must be more responsive and able to rapidly exploit new technologies to meet changing demands.

c. Research and innovate across the Defence lines of development to deliver optimised patient outcomes in all operating situations. This must include ways to push life-saving interventions closer to point of injury and raise the sophistication of forward medical capabilities.

d. Exploit data and information to drive improvements in performance. Embrace digitisation of medical support delivery throughout the OPCP, whilst retaining the ability to operate in a degraded environment.

e. Review the training of the whole force in basic first aid, health and hygiene to maximise prevention of disease and non-battle injury and increase self-sufficiency. Identify areas where medical training, skills and resources for medical and non-medical personnel can be uplifted to better support forward or remote force elements.

f. Build resilience and protection of medical assets and supply lines. Reduce dependence on medical materiel from competitors by exploring options for sovereign capability and alternative manufacturing. Increase effective strategic stockpiles by burden-sharing with partners. Use global hubs to support forward positioning of assets and supplies.

g. Maximise the workforce, employing a whole force approach. Ensure medical teams have the best mix of skills and experience for the task. Resource the end-to-end system; successful medical support to operations is reliant upon the DMS services provided in the strategic base and the global foundation as well as on operations.

h. Strengthen collaborative relationships across government, industry, academia and interoperability with international partners and allies.

Conclusion

6.5. Central to all development of the DMS out to 2030 is the maintenance of optimal patient outcomes and a healthy Defence population in the face of a shifting use of the military. The DMS must achieve advantage in a competitive medical context through rigour in targeted research, intelligent investment in capability, training that achieves ‘more for less’ and a more resilient and responsive medical materiel procurement and resupply system.

Notes

Lexicon

Abbreviations and acronyms

C4I	command, control, communication, computers, and information
CBRN	chemical, biological, radiological and nuclear
CIS	communication and information systems
CMA	competent medical authority
DCDC	Development, Concepts and Doctrine Centre
DHC	deployed hospital care
DHE	Defence health care engagement
DMS	Defence Medical Services
IOF	Integrated Operating Framework
IOpC	Integrated Operating Concept
MACA	military aid to the civil authorities
MedCM	medical countermeasures
MEDEVAC	medical evacuation
MEDINT	medical intelligence
MedOpC	Medical Operating Concept
NATO	North Atlantic Treaty Organization
NHS	National Health Service
OPCP	operational patient care pathway
PCC	prolonged casualty care
PCRF	primary casualty receiving facility
PHEC	pre-hospital emergency care
POI	point of injury
R2E	Role 2 enhanced
R2F	Role 2 forward
UK	United Kingdom

Notes

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