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Joint DOTmLPP-P Change Recommendation (DCR) for Combat Casualty Care (C3) Support for Future Operations

5 January 2021

Version 1.0

Validation Authority: Joint Capabilities Board (JCB)

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This document contains pre-decisional information for deliberative use during the C3 Capabilities-Based Assessment (CBA) sponsored by OASD(HA). As such, the information in this report is exempt from public disclosure in accordance with Title 5 USC § 552(b) (5) (Freedom of Information Act Exemption (b) (5)).

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THE JOINT STAFF

WASHINGTON, DC 20318-999

JROCM 061-21

26 August 2021

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: DOTmLPP-P Change Recommendation for Combat Casualty Care for Future Operations

1. The Joint Capabilities Board (JCB) reviewed and endorsed the DOTmLPP-P Change Recommendation (DCR) for Combat Casualty Care for Future Operations. The JCB approved the attached actions and requests the Director of Research and Development Policy & Oversight, OASD (HA) as the lead organization for implementation.
2. The Combat Casualty Care for Future Operations DCR documents the capability requirements, shortfalls, and recommended materiel solution approaches to improve the Joint Force's ability to conduct combat casualty care. It presents a suite of integrated DOTmLPP-P solutions to mitigate gaps and improve the ability to conduct combat casualty care (C3) in support of future operations.
3. The JCB tasked the Office of the Secretary of Defense, the Services, the Combatant Commands, Joint Staff and Agencies implement actions as outlined in the attachments. The Director of Research and Development Policy & Oversight, OASD (HA) will use the DCR module in the Joint Staff's Knowledge Management/Decision Support tool for tracking, monitoring, and adjudication of the actions and suspense dates. The JCB requests that the Director of Research and Development Policy & Oversight, OASD (HA) provide a semi-annual update to the Health Services WG and an annual update to the Logistics Functional Capabilities Board.

A handwritten signature in blue ink, appearing to read "R. A. Boxall", is positioned above the typed name.

R. A. BOXALL
VADM, USN
Chair, Joint Capabilities Board

Attachments:

- A – Combat Casualty Care for Future Operations DOTmLPP-P Change Recommendation Actions
- B – Combat Casualty Care for Future Operations DOTmLPP-P Change Recommendation Funding

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ENCLOSURE A

**Combat Casualty Care for Future Operations
DOTmLPF-P Change Recommendation (DCR) Actions**

DOTmLPF-P Category and OPR	Action	Suspense Date
DOTmLPF-P: Doctrine OPR: Army OCR: Services, CCMDs, USTRANSCOM, DHA	1. Review and, if necessary, revise JP 4-02 to account for future operating environments, including care in prolonged and/or austere environments.	JROCM + 24 months
DOTmLPF-P: Doctrine OPR: Services OCR: CCMDs, DHA	2. Review and, if necessary, revise or develop multi-service TTPs for patient movement (both inter- and intra-theater) in future operating environments that can be used by medical as well as non-medical personnel.	JROCM + 48 months
DOTmLPF-P: Doctrine OPR: Services	3. After conducting C3 simulations, TTXs, and training exercises, review and, if necessary, revise or develop multi-service TTPs for C3 during future operations and in challenging environments.	JROCM + 48 months
DOTmLPF-P: Doctrine OPR: DHA OCR: Services	4. Review and, if necessary, revise or develop blood product TTPs for C3 in prolonged and/or austere environments.	JROCM + 24 months
DOTmLPF-P: Organization OPR: Services	5. Review and, if necessary, revise organizational table of personnel and equipment in order to align with TCCC and damage control resuscitation requirements and conditions in future operating environments.	JROCM + 60 months

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DOTmLPF-P Category and OPR	Action	Suspense Date
DOTmLPF-P: Organization OPR: Services	6. Review and, if necessary, revise or develop C3 preplanned supply assemblages to ensure scalable packages of C3 supplies can be forward-deployed (including using autonomous delivery or air drop) to support triage and treatment in MASCAL situations far-forward, PC, or austere environments	JROCM + 48 months
DOTmLPF-P: Organization OPR: DHA OCR: Services	7. Once policy is updated to include a comprehensive walking blood bank program, develop an implementation plan for establishing a walking blood bank program office.	JROCM + 48 months
DOTmLPF-P: Training OPR: Services OCR: DHA	8. Develop or revise medical training programs to cover medical requirements in prolonged and/or austere environments.	JROCM + 60 months
DOTmLPF-P: Training OPR: Services	9. Review and revise, if necessary, Joint, allied/coalition/partner, and Service wargames and exercises to improve understanding and practice of medical preparedness and response to the wide spectrum of military infectious diseases.	JROCM + 24 months
DOTmLPF-P: Training OPR: Services OCR: DHA	10. Review and revise, as appropriate, programs of instruction for relevant medical logistics, logistics, FHP officers, medical planning, and operational planning courses on planning for IDs in operational environments.	JROCM + 24 months
DOTmLPF-P: Training OPR: Services OCR: DHA	11. Review and, if necessary, revise training for personnel accessing, testing, and transporting biological samples and specimens, including laboratory and field laboratory personnel.	JROCM + 12 months
DOTmLPF-P: Materiel OPR: Services	12. Develop medical evacuation vehicle design standards and update joint en route care equipment testing standards to	JROCM + 18 months

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DOTmLPPF-P Category and OPR	Action	Suspense Date
	maximize safety of C3 providers and WII warfighters.	
DOTmLPPF-P: Leadership and Education OPR: Services OCR: DHA	13. Review and, if necessary, revise JPME, PME, and joint medical planning courses to include WII warfighter response and ensure appropriate coverage of prolonged and austere planning scenarios.	JROCM + 36 months
DOTmLPPF-P: Personnel OPR: Services OCR: DHA	14. Review and, if necessary, revise en route care provider skillsets to include those skills required to support future WII warfighter evacuation.	JROCM + 36 months
DOTmLPPF-P: Policy OPR: OASD(HA) OCR: OUSD(P&R), DHA	15. Review and, if necessary, revise or develop policies for C3 in future operating environments	JROCM + 36 months
DOTmLPPF-P: Policy OPR: OUSD(P&R) OCR: Services, DHA	16. Review and, if necessary, revise DoDI 6480.04 to include a comprehensive walking blood bank program.	JROCM + 36 months
DOTmLPPF-P: Policy OPR: OUSD(P&R) OCR: OASD(HA), Services	17. Revise DoDI 6025.19 to include the donor prescreen process and testing.	JROCM + 18 months
DOTmLPPF-P: Policy OPR: OASD(HA) OCR: DoD CIO, Services, DHA	18. Review and, if necessary, revise or develop policies governing C3 data.	JROCM + 36 months
DOTmLPPF-P: Policy OPR: Services OCR: DHA	19. Develop a standardized approach to examine long-term WII warfighters outcomes following provision of C3.	JROCM + 18 months

ENCLOSURE B

Combat Casualty Care for Future Operations
DOTmLPP-P Change Recommendation (DCR) Funding Requirements

Required Resource Changes Needed to Implement DOTmLPP-P ¹									
Base Year (BY) 21 ²	Fiscal Year (FY)21	Future Years Defense Program (FYDP) Resources (\$K)						Post-FYDP (FY26-FY61)	Life Cycle Cost (FY21-FY61)
		FY22	FY23	FY24	FY25	FY26	FYDP Total		
Research, Development, Testing, & Evaluation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Procurement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Military Construction	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Operations and Maintenance	\$0	\$363	\$363	\$0	\$0	\$0	\$726	\$0	\$0
Military Personnel	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$363	\$363	\$0	\$0	\$0	\$726	\$0	\$0

Notes:
¹ Current Year is FY21. First post-FYDP year is FY2026. End of planned capability life, or end of 30-year TOA project if no planned service life, is FY51.
² All resources normalized to a standard base year reference: BY21

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Executive Summary

The Office of the Assistant Secretary of Defense for Health Affairs developed this Joint Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTmLPPF-P) Change Recommendation (DCR) to propose solutions to improve the Joint Force's ability to conduct combat casualty care (C3) in support of future operations.

Analysis identified several shortfalls, including:

- The Joint Force has limited joint guidance that addresses C3 in prolonged and/or austere environments.
- The Joint Force lacks surgical capabilities at point of injury and in prolonged care.
- The Joint Force lacks sufficient understanding of the short- and long-term consequences of wound and polytrauma patterns caused by emerging weapon systems.
- The Joint Force lacks sufficient pain management approaches that allow for preservation of combat effectiveness.
- The Joint Force lacks standardized and validated psychological and physiological return-to-duty assessment criteria that encompass the spectrum of injury and disease experienced by wounded, ill, and injured (WII) warfighters.
- Medical command, control, communications, computers, and intelligence systems have limited capability to integrate with non-medical command and control/mission control systems to provide commanders the situational awareness required to make real-time decisions and/or transmit WII warfighter data/documentation.

To address these issues, this DCR recommends a suite of DOTmLPPF-P actions, including:

- Review and, if necessary, revise Joint Publication 4-02 and medical tactics, techniques, and procedures to account for future operating environments, including care in prolonged and/or austere environments.
- Review and, if necessary, revise organizational equipment sets to align with Tactical Combat Casualty Care and damage control resuscitation requirements and conditions in future operating environments.
- Develop or revise medical training programs to cover medical capabilities needed during prolonged care and/or in austere environments.
- Review and, if necessary, revise policies to account for C3 in future operating environments.
- Review and, if necessary, revise or develop joint policies governing C3 data.

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1. Operational Context. This Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTmLPP-P) Change Recommendation (DCR) documents the capability requirements, shortfalls, and recommended solution approaches developed during the execution of the Combat Casualty Care (C3) Capabilities-Based Assessment (CBA).

a. Background. The Joint Force (JF) must provide effective C3 to maximize the combat effectiveness and survivability of warfighters in all operational environments. The future battlespace will be characterized by: dispersed and multi-domain operations; austere environments; contested communications; emerging weaponry that may result in high volumes of wounded, ill, and injured (WII) warfighters and/or new injury patterns; and anti-access/area denial that will delay WII warfighter movement. The JF must have the ability to mitigate the impact of injuries and rapidly adapt or develop new C3 capabilities to preserve operational power, regardless of the environment. To support these requirements, the Department of Defense (DoD) must assess and prioritize research and development (R&D) efforts to account for the medical burden, namely prolonged care (PC), of combat operations with limited medical resources and delayed or unavailable WII warfighter movement.

In recognition of the significant challenges associated with executing C3 in the projected future operating environment, the Deputy Assistant Secretary of Defense for Health Readiness Policy & Oversight directed the C3 CBA to identify a full suite of recommendations to mitigate the impact of WII warfighters on the combat effectiveness of the JF. Additional solution approaches resulting from the C3 CBA can be found in the corresponding Joint DCR and Initial Capabilities Documents (ICD): *Joint DCR for Autonomous Care and Evacuation (ACE) Support of C3*, *ICD for C3 Support for Future Operations*, and *ICD for ACE Support of C3*. The C3 CBA and follow-on requirements documents also build on, but do not replace, the 2015 Joint Requirements Oversight Council Memorandum (JROCM) 025-15, *C3 Medical R&D DCR*.

b. Strategic Guidance

(1) *National Security Strategy (NSS), 2017*. To meet future military requirements, the *NSS* calls for restoration of the ability to produce innovative capabilities and readiness for major war. This includes the preservation of combat power through the ability to deliver quality health care in all future combat environments and operations. As such, the medical community must continue to be innovative and develop programs that meet future military requirements.

(2) *National Defense Strategy (NDS), 2018*. The *NDS* provides guidance for competing, deterring, and winning in a security environment marked by long-term strategic competition, rapid technology dispersion, and new concepts of warfare and competition that span the spectrum of conflict. This future operating environment poses challenges to current C3 activities, including providing care and holding capabilities at or near point of injury (POI) for longer periods of time than in recent conflicts. DoD must continue to improve C3 capabilities to maximize force capabilities, restore combat effectiveness, and improve warfighter performance.

(3) *National Military Strategy (NMS), 2018*. The *NMS* provides the JF a framework for protecting and advancing U.S. national interests, including the notion of joint combined arms. The JF and its leaders must be as comfortable fighting in space or cyberspace as they are in land, sea, or air. To achieve success across all domains and environments, the JF must be medically ready to operate anywhere, any time, and against any force or type of attack.

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(4) Department of Defense Directive (DoDD) 6200.04, *Force Health Protection (FHP)*, 2007. This DoDD establishes policy and assigns responsibility for implementing FHP measures, encompassing the full spectrum of missions, responsibilities, and actions of DoD Components in establishing, sustaining, restoring, and improving the health of their forces. To prevent injury and illness, Military Departments should employ flexible, adaptive, modular, scalable, and interchangeable medical capabilities, logistics systems, and information management to ensure a medically ready force and a ready medical force.

(5) Department of Defense Instruction (DoDI) 6000.18, *Medical Modeling and Simulation (MM&S) Requirements Management*, 2018. This DoDI outlines the roles and responsibilities to form and maintain a DoD MM&S capability that supports planning, decision making, and education and training programs across DoD. It establishes that medical technologies and knowledge products must be advanced through research, development, testing, and evaluation to enhance MM&S capabilities.

(6) DoDI 1322.24, *Medical Readiness Training (MRT)*, 2018. This DoDI states that all Service members will receive role-based (i.e., all Service members, Combat Lifesaver, Combat Medic/Corpsmen, Aerospace Medicine Technician, and Combat Paramedic/Provider) tactical combat casualty care (TCCC) training and certification as outlined in the Joint Trauma System's TCCC Skills List. All DoD expeditionary civilian personnel will conduct initial TCCC training and certification prior to deployment. DoD expeditionary civilian personnel certify in TCCC when they successfully complete the appropriate, role-based TCCC training course in accordance with their skill level. Certification in TCCC requires use of the current, standardized curricula developed by the Joint Trauma System in accordance with DoDI 6040.47, *Joint Trauma System*. TCCC training will replace the core trauma skills taught in Service-specific first aid, self aid, and buddy care courses. Services may also have additional medical training requirements.

c. Concepts

(1) *Capstone Concept for Joint Operations: Joint Force 2030 (CCJO)*, 2019. The *CCJO* describes the future operating environment and an approach for future JF operations in that environment. Specifically, the outlined approach necessitates a globally postured JF capable of quickly combining capabilities with mission partners across domains, echelons, geographic boundaries, and organizational affiliations. These networks of forces and partners must form, evolve, dissolve, and reform in different arrangements in time and space. To support globally integrated operations (GIO), the JF must have a medically ready force and a ready medical force equipped with standardized and interoperable materiel.

(2) *Joint Concept for Health Services (JCHS)*, 2015. The *JCHS* describes a vision for what the collective medical enterprise must provide to support GIO. It addresses and outlines how to provide health services to deployed forces in an operational environment characterized by highly distributed operations and minimal, if any, pre-established health service infrastructure. Specifically, it notes that the JF requires advanced technologies, improved diagnostic tools, innovative treatment protocols, and increased specialization in each role of care to mitigate the possible negative impacts of delayed movement. Additionally, the *JCHS* describes an operating environment with varied medical challenges, including weapons of mass destruction (WMD) creating mass effects and new types of wounds from evolving weapons. To mitigate these challenges, DoD requires prioritized and streamlined advanced medical component development

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efforts with reduced timelines to expedite technology transition from the laboratory to operational use.

(3) *Operational Medicine (OpMed) Concept of Operations (CONOPS)*, 2018. The *OpMed CONOPS* addresses the challenge of providing comprehensive health services to the JF and its mission partners conducting highly distributed operations. It describes an end state for OpMed capabilities where the JF maintains sufficient operational capability and capacity by minimizing the impacts of environmental threats and consequences of wounds, injuries, illness and psychological stressors on the JF and individual warfighters. Highly dispersed operations will require the Joint medical force to be sufficiently trained and equipped to conduct POI through Role 2 treatment in more self-sufficient modes, potentially without advanced diagnostics, surgical technologies, communications, and/or rapid evacuation. Mitigating the risks associated with delayed evacuation while maintaining survivability requires the development of supporting technologies, medical materiel, and increased skill training.

d. C3 Operational Viewpoint-1 (OV-1). The C3 OV-1 (Figure 1) provides the overarching vision for C3, as defined for this DCR. It brings together the ends, ways, and means outlined for addressing the military challenge C3 seeks to solve or mitigate. It links all aspects of the C3 process that support the desired C3 outcomes. The C3 OV-1 also served to guide focused research during the literature analysis and development of the C3 Operational Viewpoint-5a (OV-5a), also known as an Activity Decomposition Tree. The C3 OV-1 was developed for, and refined by, a discussion with the key personnel that defined the scope of the C3 CBA.



Figure 1. C3 OV-1

2. Threat Summary. The C3 capability is not intended to address a particular Defense Intelligence Agency adversary threat but pertains to the following threat modules: Land Warfare TTP/OE - Future Operational Environment Overview, Nuclear and Radiological Warfare, Biological Warfare, Chemical Warfare, Land Warfare TTP/OE - Near-Peer Offense (Russia),

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Land Warfare TTP/OE - Near-Peer Defense (Russia), and Land Warfare TTP/OE - Nonstate Threats to Blue Stability Operations: Fragile State.

Providing effective C3, including PC, in all environments is a significant challenge for the JF, affecting its ability to preserve operational power and effectiveness. While great strides were made in recent decades and current mortality rates are at an unprecedented low, the future operational environment is expected to strain caregivers, resources, and systems. The *Joint Operating Environment (JOE) 2040* describes the future security environment, characterized by competition, conflict, and contested communication across all domains, along with the implications for change so the JF can project and prepare for future conflicts from a common baseline. It is intelligence-driven, oriented on the 2 + 3 threats, and focused by the Chairman of the Joint Chiefs of Staff's direction to the force. Projections for the near/mid-term are that the post-World War II international system will be under increasing strain amid continuing WMD (new technologies across the chemical, biological, radiological, and nuclear [CBRN]) spectrum proliferation threats and that contested norms will feature progressively intense, peer adversaries that pose serious threats to information and homeland security. Additionally, threats will expand and diversify, driven by adversary use of hybrid strategies as well as multi-domain, dispersed, and fluid operations. Furthermore, competition in space, the electromagnetic spectrum operational environment, and regional conflicts will cut across all domains.

These issues will result in conditions that affect medical operations, such as limited freedom of access and maneuverability, uncontrolled spread of WMD, disrupted flow of medical information, and adversaries' increased use of mass effect weaponry. Additionally, foreign intelligence entities could jeopardize the integrity of C3 capabilities through technology targeting, interruption of supply chain operations, or the use of trusted insiders. These conditions may decrease the JF's operational capabilities and capacities for supporting national security objectives, which in turn will increase requirements to develop and field capabilities to manage and treat combat trauma and maintain the readiness and health of the operational force.

To access the Defense Intelligence Threat Library for up-to-date threat information, please visit <https://threatlibrary.dodis.ic.gov/modules> (JWICS) or <https://threatlibrary.dse.dia.smil.mil/home> (SIPRNET).

3. Capability Discussion

a. Analytic Process. The study team conducted analysis in accordance with guidelines established in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 5123.01H, *Charter of the Joint Requirements Oversight Council (JROC) and Implementation of the Joint Capabilities Integration and Development System (JCIDS)* and the *Manual for the Operation of the JCIDS*. These documents institutionalize the JCIDS, a collaborative process that uses joint concepts and supporting analyses to identify redundancies and prioritize capability gaps and integrated DOTmLPF-P solutions to address those gaps. To date, the CBA has had three major phases: requirements development, shortfalls identification, and solutions development.

(1) Requirements Development. The objective of this phase was to develop a working description of C3. To support requirements development, the study team conducted in-depth literature analysis, numerous subject matter expert (SME) interviews, and internal study team discussions. The outputs from this phase were the C3 OV-1 and the draft C3 OV-5a. The study team refined the draft C3 OV-5a and developed a detailed C3 Capability View-2 (CV-2),

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also known as a Taxonomy, based on the OV-5a. The study team developed these products through a strategy-to-capability-to-task analysis, linking strategic guidance and relevant concepts under the C3 OV-1. The OV-5a documents activities in a non-linear manner, meaning activities are not sequential, may overlap with other tasks, and may be conducted by a variety of personnel. The CV-2 includes detailed capability descriptions and desired effects, task purpose statements and relevant conditions, attributes, and measure statements for evaluation of capability and task performance. Attendees at the Requirements Development Working Meeting reviewed and refined the OV-5a and the CV-2.

(2) Shortfalls Identification. The objective of this phase was to develop a list of validated shortfalls in the JF's ability to conduct C3. From project inception through this phase, the study team conducted a broad literature review, including DoD studies, academic studies, other relevant literature, and a community of interest (COI) survey. Through analysis of these sources, the study team developed an initial list of over 1,000 potential issues regarding C3 capabilities and activities. The study team consolidated redundancies within these 1,000 issues to produce a list of 81 draft shortfalls. The study team presented the draft shortfalls to four breakout groups during the Shortfalls Identification Working Meeting.

(3) Solutions Development. The objective of this phase was to develop, assess, and recommend suitable, feasible, and acceptable solutions to gaps identified in the previous phase. The study team conducted analysis to isolate causes of identified shortfalls, research to identify ongoing efforts that could address the shortfalls, and SME interviews to identify potential materiel and non-materiel solution approaches. The team then developed strawman solutions that working meeting attendees refined. After the working meeting, the study team developed materiel and non-materiel solutions to institutionalize the structure and policies needed to ensure enduring execution of C3 capabilities.

b. Capability Requirements and Gaps/Overlaps

(1) Challenge. How will the JF preserve operational capabilities through the management of WII warfighters during the conduct of highly mobile and distributed operations in an extended and increasingly lethal battlespace capable of producing high volumes of WII warfighters?

(2) Required Capability. Conduct C3.

(a) Description. The ability to optimize the readiness and health of the JF by managing and treating combat injuries.

(b) Desired Effect. The JF maintains readiness and preserves operational capabilities through the provision of C3 interventions that maximize warfighter survivability and return to combat effectiveness.

(c) Supporting Capabilities. The analysis focused on 12 sub-capabilities apportioned into 4 operational activities that enable C3 activities.

- Prepare for C3 Execution. The ability to identify, adapt, and sustain required capabilities for C3 in all operational environments.
- Manage C3 Application. The ability to oversee and manage the provision of medical interventions to WII warfighters.

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- Treat WII Warfighters. The ability to provide medical interventions to WII warfighters at POI through Role 3 in all operational environments.
- Assess C3 Activities. The ability to evaluate the JF’s execution of C3 activities and develop and implement appropriate responses.

(3) Capability Shortfalls. Analysis identified numerous shortfalls in the JF’s ability to conduct C3. The overarching shortfalls identified are noted in Table 1.

Table 1. C3 Required Capability: Conduct C3

Conduct C3		
Joint Capability Area (JCA) 4.8: Logistics/Health Services		
Description		Desired Effect
The ability to optimize the readiness and health of the JF by managing and treating combat injuries		The JF maintains readiness and preserves operational capabilities through the provision of C3 interventions that maximize warfighter survivability and return to combat effectiveness
Future Capability Objectives		Shortfalls in Performance
Attribute	Objective Statement	
Understanding	The JF is able to leverage all available information and insights to generate accurate assessments of the C3 requirements within the operational context	<ul style="list-style-type: none"> • The JF lacks comprehensive and integrated data collection and analysis to improve performance at the pre-hospital level of care (e.g., documentation of medical interventions [correct procedure, correct timing], WII warfighter outcome data) • Medical command, control, communications, computers, and intelligence systems have limited capability to integrate with non-medical command and control/mission control systems to provide commanders the situational awareness required to make real-time decisions and/or transmit WII warfighter data/documentation
Timeliness	C3 personnel are able to rapidly and efficiently triage warfighters in all conditions	<ul style="list-style-type: none"> • The JF lacks a standardized and scalable triage methodology that is suited to all future scenarios, including a mass casualty (MASCAL) event, PC, and C3 in austere environments (e.g., both land and maritime environments)
Understanding	Caregivers understand the specific PC interventions and procedures and are able to provide continuous and appropriate psychological care to the warfighter	<ul style="list-style-type: none"> • The JF has limited joint guidance that addresses C3 in prolonged and/or austere environments • The JF lacks surgical capabilities at point of injury and during PC

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Precision	C3 personnel are able to identify physical and psychological (e.g., combat stress) warfighter injuries and make appropriate initial medical care decisions with consistent accuracy	<ul style="list-style-type: none"> • The JF lacks sufficient understanding of the short- and long-term consequences of wound and polytrauma patterns caused by emerging weapon systems • The JF lacks sufficient pain management approaches that allow for preservation of combat effectiveness • The JF has a limited understanding of the implications of CBRN environments on the provision of C3, especially in cases complicated by polytrauma and disease non-battle injuries
Adaptability	Interventions restore WII warfighters to a level of combat effectiveness suited to the operational context	<ul style="list-style-type: none"> • The JF lacks standardized and validated psychological and physiological return-to-duty assessment criteria that encompass the spectrum of injury and disease experienced by WII warfighters

c. Intelligence Supportability. The recommendations outlined in this DCR will have little to no immediate effect on intelligence supportability requirements. The most likely areas impacted would be intelligence interoperability and intelligence planning and operations support. While the recommendations do not discuss the extent to which supportability will or will not be met, policy, doctrine, and training developers must ensure their solution sets meet DoD and intelligence community requirements.

4. Change Recommendations

a. General. This C3 DCR presents a comprehensive suite of DOTmLPF-P activities to mitigate shortfalls and effectively improve institutionalized capabilities to conduct C3. Detailed discussions and specific recommendations with initial offices of primary responsibility (OPR), offices of collateral responsibility (OCR), and suspense dates follow below. A complementary DCR and two complementary ICDs outline autonomous care, WII warfighter evacuation, and recommended R&D efforts. The solutions below and in the complementary documents augment the requirements previously validated, including in the 2015 JROCM 026-15, *ICD for C3 Devices and Products*.

b. Doctrine

(1) Discussion. Sound guidance related to C3 is critical to facilitating effective operations. Analysis conducted throughout the course of this CBA identified doctrine-related issues in the JF’s ability to conduct medical treatment and evacuation in future operating environments, as outlined in the military strategies and *CCJO*. The study team paid specific attention to engagements that necessitate the JF to operate across multiple domains and contend with austere and PC environments. Analysis identified limited availability of operational and planning guidance needed to address these conditions. To address/rectify identified gaps in the JF’s ability to conduct C3 in the future battlespace, DoD must revise relevant doctrine. Updating doctrine and revising or developing tactics, techniques, and procedures (TTP) for application of medical capabilities, including pre-hospital care, prolonged and/or austere care, and use of developing technology, will ensure the JF is prepared to provide C3 in the future battlespace.

(2) Recommendations

(a) OPR: Army; OCR: Services, Combatant Commands (CCMD), United States Transportation Command (USTRANSCOM), and Defense Health Agency (DHA).

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Review and, if necessary, revise Joint Publication (JP) 4-02 to account for future operating environments, including care in prolonged and/or austere environments (to include land, sea, air, and space environments); specifically:

- Update Appendix J: Planning Checklist.
- Clarify credentialing and privileging procedures and requirements for telemedicine.
- Outline interoperability standards for logistics management related to sustainability of critical medical assets in future scenarios (e.g., planning and movement of Class VIII(A) and Class VIII(B) support in large scale combat operations (LSCO), prolonged and/or austere environments). Suspense: JROCM + 24 months.

(b) OPR: Services; OCR: CCMDs and DHA. Review and, if necessary, revise or develop multi-service TTPs for patient movement (both inter- and intra-theater) in future operating environments that can be used by medical as well as non-medical personnel. Consider including:

- Procedures for incorporating modular patient care systems for trauma patients, infectious disease patients, en route surgery, and other en route care requirements.
- Procedures for patient packaging, transition, and handoff across various modes of transport and operating environments.
- Procedures for unique personal protective equipment, patient movement items, and safety for care providers and patients in future patient movement environments to ensure safe transit.
- Procedures for maritime patient evacuation (both ship to shore and ship to ship) and en route care in expeditionary and at-sea environments.
- Procedures for safe and effective movement of patients experiencing behavioral and/or psychological conditions.
- Procedures for en route care capability sustainment throughout the continuum of care, including prolonged evacuations.
- Information on optimal provider manning for effective C3 during en route care.
- Information on timing of optimal treatment and/or evacuation of WII warfighters with traumatic brain injury and other polytrauma.
- Information on environmental considerations such as extreme cold weather or dense urban environments. Suspense: JROCM + 48 months.

(c) OPR: Services. After conducting C3 simulations, tabletop exercises (TTX), and training exercises (solution 9), review and, if necessary, revise or develop multi-service TTPs for C3 during future operations (LSCO, prolonged, austere, etc.) and in challenging environments (e.g., extreme cold weather, dense urban environments). Suspense: JROCM + 48 months.

(d) OPR: DHA; OCR: Services. Review and, if necessary, revise or develop blood product TTPs for C3 in prolonged and/or austere environments. Consider including:

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- Conduct of blood transfusions in the pre-hospital environment, including en route.
- Identification and tracking of potential donors.
- Conduct of blood transfusion for military working dogs.
- Management and use of blood products in extreme hot and cold weather. Suspense: JROCM + 24 months.

c. Organization

(1) Discussion. Current standard medical equipment assemblages include the equipment for procedures required to stabilize and evacuate WII warfighters in a permissive evacuation environment. Future operating environments will require holding WII warfighters farther forward in the battlespace as evacuation may be delayed. Additional medical capabilities, including PC, palliative care, prevention of further injury, and preservation of life for warfighters submerged in saltwater will be necessary to sustain WII warfighters until evacuation can be accomplished. To provide these capabilities, medical equipment assemblages need to be aligned to the requirements of TCCC and damage control resuscitation in future operating environments. As such, relevant organizations need to review of the contents of current assemblages and organizational tables.

(2) Recommendations

(a) OPR: Services. Review and, if necessary, revise organizational table of personnel and equipment in order to align with TCCC and damage control resuscitation requirements and conditions in future operating environments, including:

- Provision of C3 during extended evacuation timeframes.
- Support of palliative care in PC environments.
- Prevention of WII warfighter degradation and/or sustainment of life for individuals submerged in saltwater or in lifesaving systems (e.g., life raft or floatation device).
- Support of optimal provider/WII warfighter ratios include considerations of task saturation and cognitive overload. Suspense: JROCM + 60 months.

(b) OPR: Services. Review and, if necessary, revise or develop C3 preplanned supply assemblages to ensure scalable packages of C3 supplies can be forward-deployed (including using autonomous delivery or air drop) to support triage and treatment in MASCAL situations far-forward, PC, or austere environments. Suspense: JROCM + 48 months.

(c) OPR: DHA; OCR: Services. Once policy is updated to include a comprehensive walking blood bank program, develop an implementation plan for establishing a walking blood bank program office. Suspense: JROCM + 48 months.

d. Training

(1) Discussion. Throughout the study, training stood out as a critical factor in providing effective C3 in support of LSCO and prolonged and/or austere environments. However, current training and exercises focus on an operating environment defined by timely WII warfighter evacuation and small numbers of WII warfighters that can be triaged quickly. Current training is inadequate for prolonged and/or austere environments. Updating medical

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training programs to address expanded treatment capabilities in a prolonged and/or austere environment will increase the overall effectiveness of frontline C3 providers, including medical and non-medical personnel. Improving frontline C3 provider effectiveness will improve overall quality of care and may contribute to increased survivability and retained operational effectiveness in future operating environments. Continuing to develop training exercises that employ C3 scenarios will help identify weaknesses in care delivery and/or validate new or updated care protocols. This will be especially important as the likelihood of CBRN injuries and trauma related to advanced weaponry increases. Similarly, advancements in training will be crucial as the use of walking blood banks expands, thereby increasing demands on medical personnel who would assist in blood typing and testing, supervision of blood collection, and investigation of transfusion reactions.

(2) Recommendations

(a) OPR: Services; OCR: DHA. Develop or revise medical training programs to cover medical requirements in prolonged and/or austere environments, to include:

- Identifying medical knowledge, skills, and abilities (KSA) and tasks specified to support pre-hospital C3, including donor pre-screening, walking blood banks, blood banking, and blood transfusions in forward deployed settings.
- Addressing basic and advanced WII warfighter needs during prolonged and/or austere care.
- Identifying KSAs to perform Damage Control Resuscitation and procedures at or near POI. Suspense: JROCM + 60 months.

(b) OPR: Services. Develop simulations, TTXs, and training exercises that stress treatment, management, and movement of WII warfighters in order to gain an understanding of medical system shortfalls in future operating environments. Suspense: JROCM + 24 months.

(c) OPR: Services; OCR: DHA. Incorporate walking blood bank training and en route blood support into officer and enlisted medical pre-deployment training modules. Suspense: JROCM + 24 months.

(d) OPR: Services; OCR: DHA. Develop an approach to manage and treat WII warfighters with combined CBRN and polytrauma injuries. Suspense: JROCM + 12 months.

e. Materiel

(1) Discussion. The JF lacks adequate medical evacuation vehicle design standards to maximize safety of C3 providers and injured warfighters in the event of a crash or unpassable sea state. While ongoing projects are investigating this problem set, review is not standardized across all movement systems. To ensure appropriate review and maximized safety of C3 providers and WII warfighters the DoD must identify and publish vehicle design characteristics, certified through updated joint en route care equipment testing, that will provide safety for both WII warfighters and providers in evacuation vehicles. Supplemental ICDs outline additional gaps that can best be solved through R&D.

(2) Recommendation. OPR: Services. Develop medical evacuation vehicle design standards and update joint en route care equipment testing standards to maximize safety of C3 providers and WII warfighters. Suspense: JROCM + 18 months.

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f. Leadership & Education

(1) Discussion. The complex nature of the future battlefield necessitates JF leaders have sufficient knowledge and understanding of C3 to integrate and tailor prolonged pre-hospital care within their units to support the full range of mission profiles and operational contexts. To develop required knowledge and support from JF leaders, leadership and education courses should be updated to incorporate this information.

(2) Recommendation. OPR: Services; OCR: DHA. Review and, if necessary, revise joint professional military education (JPME), professional military education (PME), and joint medical planning training courses to include WII warfighter response and ensure appropriate coverage of prolonged and austere planning scenarios. Suspense: JROCM + 36 months.

g. Personnel

(1) Discussion. The future battlefield will be characterized by extended evacuation, including periods when the evacuation chain maybe disrupted, requiring provision of PC by en route providers. To meet this demand, the Services should update the skillsets of relevant personnel.

(2) Recommendations. OPR: Services; OCR: DHA. Review and, if necessary, revise en route care provider skillsets to include those skills required to support future WII warfighter evacuation. Suspense: JROCM + 36 months.

h. Facilities

(1) Discussion. Not Applicable.

(2) Recommendations. No recommended solutions.

i. Policy

(1) Discussion. Analysis identified several policy-related issues for C3. Specifically, current policies are not aligned to future operating environments and must be updated. For example, policies reflect the current use of whole blood and blood products while analysis identified that the JF has limited ability to provide and resupply whole blood and blood products across the continuum of care in future operating environments. One way to close this gap is to ensure that organizations are ready to conduct blood collection in theater and maintain a walking blood bank. Both of these solutions require the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD[P&R]) to revise relevant policies.

Analysis also identified shortfalls in DoD's ability to consistently collect and analyze long-term WII warfighter outcome data following the provision of C3. This information is crucial to determining best practices for C3. As such, the DoD must establish policy to manage C3 data collection, sharing, and analysis to ensure appropriate information gets to commanders, planners, trainers, and researchers.

(2) Recommendations

(a) OPR: Office of the Assistant Secretary of Defense for Health Affairs (OASD[HA]); OCR: OUSD(P&R) and DHA. Review and, if necessary, revise or develop policies for C3 in future operating environments, including:

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- En route care that accounts for extended time frames.
- Advanced lifesaving interventions in pre-hospital and pre-surgical environments provided by pre-hospital medical providers.
- Ethical, legal, and regulatory requirements presented by prolonged and/or austere environments.
- Performance-enhancing interventions for C3 providers, as required by the stresses of future operating environments.
- C3 during space operations.
- C3 in Distributed Maritime Operations.
- Blood transfusions in the forward deployed environment (e.g., pre-screening, interventions at lower levels of care, partner nation reciprocity agreements and interoperability efforts).
- Joint walking blood bank implementation.
- Occupational specialty return-to-duty of WWII warfighters without completing definitive care treatments. Suspense: JROCM + 36 months.

(b) OPR: OUSD(P&R); OCR: Services and DHA. Review and, if necessary, revise DoDI 6480.04, *Armed Services Blood Program Operational Procedures*, to include a comprehensive walking blood bank program. Suspense: JROCM + 36 months.

(c) OPR: OUSD(P&R), OCR: OASD(HA) and Services. Revise DoDI 6025.19 to include the donor prescreen process and testing.

- Update Service readiness requirements to include donor prescreening testing. Suspense: JROCM + 18 months.

(d) OPR: OASD(HA); OCR: DoD Chief Information Officer (CIO), Services, and DHA. Review and, if necessary, revise or develop policies governing C3 data, including:

- Ownership, access, use, storage, and quality standards of C3 data for operational, clinical, and research purposes.
- Collection and documentation of data from POI through the continuum of care.
- Identification of standards for medical equipment integration and communication with electronic health records and operational networks.
- Integration between medical and non-medical systems (e.g., command, control, communications, computers, and intelligence) to support Joint health operations and commanders' battlespace awareness.
- Sharing of information between medical, intelligence, and operational communities related to emerging medical threats. Suspense: JROCM + 36 months.

(e) OPR: Services; OCR: DHA. Develop a standardized approach to examine long-term WWII warfighter outcomes following provision of C3.

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- Revise WII warfighter outcome data collection technology and/or information technology systems to ensure consistency in collecting and analyzing long-term WII warfighter outcomes. Suspense: JROCM + 18 months.

5. Implementation Plan

a. The study team recommends full implementation, as outlined in the Proposed Implementation Plan. However, some actions may prove to be infeasible in a resource-constrained environment. Implementation of the doctrine and policy recommendations would facilitate significant improvement with minimal shortfalls remaining unfilled. Inability to implement materiel recommendations or improve existing technological efforts may impede the JF's ability to conduct C3 in all future operating environments.

b. Proposed Implementation Plan. This section outlines a notional implementation plan (Table 2) for the DOTmLPP-P recommendations. It assumes a JROC validation date in October 2021. Once a signed JROCM validates this DCR, the Joint Staff, with assistance from the Combat Casualty Care Research Program, will identify specific, named points of contact. Additionally, they will revise all dates in Table 2 to match the JROCM.

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Table 2. Proposed Implementation Plan

DOTMLPF-P Category + Solution	OPR	OCR	Pre-requisite	Milestones (JROCM + X Months)			
				Identify POC	Study Plan	Intermediate Actions	Suspense
1. Doctrine. Review and, if necessary, revise JP 4-02 to account for future operating environments, including care in prolonged and/or austere environments.	Army	Services, CCMDs, USTRANSCOM, DHA		3 Months	6 Months	N/A	24 Months
2. Doctrine. Review and, if necessary, revise or develop multi-service TTPs for patient movement (both inter- and intra-theater) in future operating environments that can be used by medical as well as non-medical personnel.	Services	CCMDs, DHA	9	27 Months	30 Months	Identify TTPs	48 Months
3. Doctrine. After conducting C3 simulations, TTXs, and training exercises, review and, if necessary, revise or develop multi-service TTPs for C3 during future operations and in challenging environments.	Services		9	27 Months	30 Months	C3 simulations, scenarios, TTXs, and training exercises	48 Months
4. Doctrine. Review and, if necessary, revise or develop blood product TTPs for C3 in prolonged and/or austere environments.	DHA	Services		3 Months	6 Months	Identify TTPs	24 Months
5. Organization. Review and, if necessary, revise organizational table of personnel and equipment in order to align with TCCC and damage control resuscitation requirements and conditions in future operating environments.	Services		9	27 Months	30 Months	N/A	60 Months
6. Organization. Review and, if necessary, revise or develop C3 preplanned supply assemblages to ensure scalable packages of C3 supplies can be forward-deployed	Services		9	27 Months	30 Months	N/A	48 Months

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DOTMLPF-P Category + Solution	OPR	OCR	Pre-requisite	Milestones (JROCM + X Months)			
				Identify POC	Study Plan	Intermediate Actions	Suspense
(including using autonomous delivery or air drop) to support triage and treatment in MASCAL situations far-forward, PC, or austere environments.							
7. Organization. Once policy is updated to include a comprehensive walking blood bank program, develop an implementation plan for establishing a walking blood bank program office.	DHA	Services	17	39 Months	42 Months	N/A	48 Months
8. Training. Develop or revise medical training programs to cover medical requirements in prolonged and/or austere environments.	Services	DHA	9	27 Months	30 Months	N/A	60 Months
9. Training. Develop simulations, TTXs, and training exercises that stress treatment, management, and movement of WII warfighters in order to gain an understanding of medical system shortfalls in future operating environments.	Services			2 Months	4 Months	N/A	24 Months
10. Training. Incorporate walking blood bank training and en route blood support into officer and enlisted medical pre-deployment training modules.	Services	DHA		2 Months	4 Months	N/A	24 Months
11. Training. Develop an approach to manage and treat WII warfighters with combined CBRN and polytrauma injuries.	Services	DHA		3 Months	6 Months	N/A	12 Months
12. Materiel. Develop medical evacuation vehicle design standards and update joint en route care equipment testing standards to maximize safety of C3 providers and WII warfighters.	Services			1 Months	4 Months	N/A	18 Months

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DOTMLPF-P Category + Solution	OPR	OCR	Pre-requisite	Milestones (JROCM + X Months)			
				Identify POC	Study Plan	Intermediate Actions	Suspense
13. Leadership and Education. Review and, if necessary, revise JPME, PME, and joint medical planning courses to include WII warfighter response and ensure appropriate coverage of prolonged and austere planning scenarios.	Services	DHA		2 Months	4 Months	N/A	36 Months
14. Personnel. Review and, if necessary, revise en route care provider skillsets to include those skills required to support future WII warfighter evacuation.	Services	DHA		3 Months	6 Months	N/A	36 Months
15. Policy. Review and, if necessary, revise or develop policies for C3 in future operating environments.	OASD(HA)	OUSD(P&R), DHA		3 Months	6 Months	N/A	36 Months
16. Policy. Review and, if necessary, revise DoDI 6480.04 to include a comprehensive walking blood bank program.	OUSD(P&R)	Services, DHA		3 Months	6 Months	N/A	36 Months
17. Policy. Revise DoDI 6025.19 to include the donor prescreen process and testing.	OUSD(P&R)	OASD(HA), Services		3 Months	6 Months	N/A	18 Months
18. Policy. Review and, if necessary, revise or develop policies governing C3 data.	OASD(HA)	DoD CIO, Services, DHA		3 Months	6 Months	N/A	36 Months
19. Policy. Develop a standardized approach to examine long-term WII warfighters outcomes following provision of C3.	Services	DHA		2 Months	4 Months	N/A	18 Months

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c. Rough Order of Magnitude Costs. The costs for implementation have a small impact on the overall OPR budgets because many tasks' costs are covered under previously programmed operations and maintenance budgets. New funding requirements primarily relate to those recommendations dealing with studies under existing programmatic areas within the identified OPRs. Costs are developed based on a blended rate of full-time equivalent of personnel to execute implementation of solution approaches.

Table 3. Rough Order of Magnitude

Required Resource Changes Needed to Implement DOTmLPF-P ¹									
Base Year (BY) 21 ²	Fiscal Year (FY)21	Future Years Defense Program (FYDP) Resources (\$K)						Post-FYDP (FY26-FY51)	Life Cycle Cost (FY21-FY51)
		FY22	FY23	FY24	FY25	FY26	FYDP Total		
Research, Development, Testing, & Evaluation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Procurement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Military Construction	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Operations and Maintenance	\$0	\$363	\$363	\$0	\$0	\$0	\$726	\$0	\$0
Military Personnel	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$363	\$363	\$0	\$0	\$0	\$726	\$0	\$0

Notes:
¹ Current Year is FY21. First post-FYDP year is FY2026. End of planned capability life, or end of 30-year TOA project if no planned service life, is FY51.
² All resources normalized to a standard base year reference: BY21

6. Appendices

Appendix A. References

Appendix B. Acronym List

Appendix C. Glossary

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Appendix A. References

A Design for Maintaining Maritime Superiority, Version 2.0, December 2018.

Armed Services Biomedical Research Evaluation and Management (ASBREM) COI, *Summary of the Autonomous Medical Evacuation Workshop*, July 2018.

Army Medical Department (AMEDD), *Concept for Medical Operations and Support White Paper*, July 2019.

AMEDD, *Medical Applications for AI and Automated Solutions White Paper*, August 2019.

ASBREM COI, *Capability Development Document for Joint Medical Exchange & Documentation of Information for Combat Casualty Care*, 2 April 2018.

Biological Warfare Threat Module, DIA_F_10631_A, 15 Nov 2019.

Capstone Concept for Joint Operations (CCJO) Joint Force 2030, 2019.

CCJO Implementation Plan, June 2019.

Chemical Warfare Threat Module, DIA_F_10633_A, 15 Nov 2019.

Chairman of the Joint Chiefs of Staff Instruction 5123.01H, *Charter of the Joint Requirements Oversight Council (JROC) and Implementation of the Joint Capabilities Integration and Development System (JCIDS)*, 31 August 2018.

C3 CONOPS (Draft), August 2020.

C3 CBA Department of Defense Architecture Framework (DODAF), <https://info.health.mil/hco/j35/opmed/JCIDS/Shared%20Documents/210106%20C3%20CBA%20DoDAFs.pdf>, 2020.

Directive-type Memorandum-17-004, *Department of Defense Expeditionary Civilian Workforce*, January 25, 2017, Incorporating Change 3, Effective February 12, 2020.

Department of Defense Directive 6200.04, *Force Health Protection (FHP)*, 23 April 2007.

Department of Defense Instruction 1322.24, *Medical Readiness Training (MRT)*, 16 March 2018.

DoDI 6000.18, *Medical Modeling and Simulation (MM&S) Requirements Management*, 22 August 2018.

Final Report for the Combat Casualty Care Capabilities-Based Assessment, 2020.

Joint Capability Area (JCA) Definitions, 3 August 2018.

JCA Framework, 3 August 2018.

Joint Concept for Health Services, 2015.

Joint Operating Environment 2040 Unclassified Summary, 2019.

Joint Publication (JP) 4-02, *Joint Health Services*, 11 December 2017, Incorporating Change 1, 28 September 2018.

Joint Requirements Oversight Council Memorandum (JROCM) 009-19, *Theater Medical Logistics Support (TMLS)*, 25 February 2019.

UNCLASSIFIED

JROCM 019-17, *Information Systems (IS) Capability Development Document (CDD) for Theater Medical Information Requirements (TMIR)*, 28 February 2017.

JROCM 025-15, *Combat Casualty Care Medical Research and Development DOTmLPP-P Change Request*, 12 March 2015.

JROCM 026-15, *ICD for Combat Casualty Care Devices and Products*, 12 March 2015.

JROCM 031-14, *Force Health Protection (FHP)*, 26 March 2014.

JROCM 048-15, *Joint Theater Patient Evacuation (JTPE)*, 15 May 2015.

JROCM 049-19, *Multi-Modal Patient Movement (MM-PM)*, 28 May 2019.

JROCM 050-19, *Medical Readiness Skills Sustainment (MRSS)*, 28 May 2019.

JROCM 112-17, *Theater Medical Information Requirements (TMIR)*, 6 November 2017.

JROCM 113-17, *Essential Medical Capabilities (ECM)*, 6 November 2017.

JROCM 125-17, *Forward Resuscitative Care in Support of dispersed Operations DOTmLPP-P Change Recommendation*, 11 December 2017.

JROCM 126-17, *Department of Defense Trauma Enterprise DOTmLPP-P Change Recommendation*, 11 December 2017.

Joint Staff Innovation Group Report on Autonomous CASEVAC Tabletop Exercise, December 2018.

National Science and Technology Council, *National Artificial Intelligence Research and Development Strategic Plan*, October 2016.

National Defense Strategy, January 2018.

National Military Strategy, 2018.

National Security Strategy, December 2017.

Operational Medicine Concept of Operations, 2018.

Prolonged Care in Support of Conventional Military Forces CBA, 14 April 2017.

Radiological/Nuclear Warfare Threat Module, Document number: DIA_F_09588_A, 05 Dec 2019.

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Appendix B. Acronyms

BY	Base Year
C3	Combat Casualty Care
CBA	Capabilities-Based Assessment
CBRN	Chemical, Biological, Radiological and Nuclear
CCJO	Capstone Concept for Joint Operations
CCMD	Combatant Command
CIO	Chief Information Officer
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
COI	Community of Interest
CONOPS	Concept of Operations
CV-2	Capability View-2
DCR	DOTmLPF-P Change Recommendation
DHA	Defense Health Agency
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOTmLPF-P	Doctrine, Organization, Training, materiel, Leadership & Education, Personnel, Facilities, Policy
FHP	Force Health Protection
FY	Fiscal Year
FYDP	Future Years Defense Program
GIO	Globally Integrated Operations
ICD	Initial Capabilities Document
JCA	Joint Capability Area

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JCB	Joint Capabilities Board
JCHS	Joint Concept for Health Services
JCIDS	Joint Capabilities Integration and Development System
JF	Joint Force
JMPT	Joint Medical Planning Tool
JOE	Joint Operating Environment
JP	Joint Publication
JPME	Joint Professional Military Education
JROC	Joint Requirements Oversight Council
JROCM	Joint Requirements Oversight Council Memorandum
KSA	Knowledge, Skills, and Abilities
LSCO	Large Scale Combat Operations
MASCAL	Mass Casualty
MM&S	Medical Modeling and Simulation
MPTk	Medical Planners Tool Kit
MRT	Medical Readiness Training
NATO	North Atlantic Treaty Organization
NDS	National Defense Strategy
NMS	National Military Strategy
NSS	National Security Strategy
OASD(HA)	Office of the Assistant Secretary of Defense for Health Affairs
OCR	Office of Collateral Responsibility
OJSS	Office of the Joint Staff Surgeon
OpMed	Operational Medicine

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OPR	Office of Primary Responsibility
OUSD(P&R)	Office of the Under Secretary of Defense for Personnel and Readiness
OV-1	Operational Viewpoint-1
OV-5a	Operational Viewpoint-5a
PC	Prolonged Care
PME	Professional Military Education
POI	Point of Injury
R&D	Research and Development
SME	Subject Matter Expert
TCCC	Tactical Combat Casualty Care
TTP	Tactics, Techniques, and Procedures
TTX	Tabletop Exercise
U.S.	United States
USTRANSCOM	United States Transportation Command
VOLT	Validated Online Lifecycle Threat
WII	Wounded, Ill, and Injured
WMD	Weapons of Mass Destruction

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Appendix C. Glossary

Artificial Intelligence. Also known as AI. AI refers to the ability of machines to perform tasks that normally require human intelligence – for example, recognizing patterns, learning from experience, drawing conclusions, making predictions, or taking action – whether digitally or as the smart software behind autonomous physical systems. [Source: DoD AI Strategy, 2018]

Autonomous Care. Autonomous care is the provision of care for a specific injury or illness through medical devices, tools, and technologies utilizing AI to diagnose and/or treat trauma, either by assisting a human provider or autonomously without human involvement. Autonomous care has the potential to reduce the time spent by qualified medical personnel on diagnosing and treating casualties, especially in a MASCAL situation. Autonomous care may also allow for personnel not normally qualified to make a specific medical decision to determine the treatment action needed and guide the accomplishment of the treatment action, or in the case of fully autonomous medical devices, perform the treatment action without human involvement. [Source: Study Team]

Capability. The ability to complete a task or execute a course of action under specified conditions and level of performance. [Source: CJCSI 5123.01H]

Capability Requirements. A capability required to meet an organization’s roles, functions, and missions in current or future operations. To the greatest extent possible, capability requirements are described in relation to tasks, standards, and conditions in accordance with the Universal Joint Task List or equivalent DoD component task list. If a capability requirement is not satisfied by a capability solution, then there is also an associated capability gap. A requirement is considered to be ‘draft’ or ‘proposed’ until validated by the appropriate authority. [Source: CJCSI 5123.01H]

Caregiver: The person, platform, system, or device, to include autonomous or AI providers, that is administering treatment to a WII warfighter. [Source: Study Team]

Combat Casualty Care. Also known as C3. The preservation of operational capabilities through medical interventions that maximize warfighter survivability and return to combat effectiveness. [Source: Study Team]

Combat Effectiveness. The ability of an individual to perform assigned missions or functions. [Source: Derived from AAP-06, North Atlantic Treaty Organization (NATO) Glossary of Terms and Definitions (English and French), 2019 Edition]

Health Services. Medical capabilities designed to perform, provide, or arrange the promotion, improvement, conservation, or restoration of human mental and physical well-being that may be used to support the NMS and the readiness of the Joint Force. [Source: JCHS]

Health Services Support. All services performed, provided, or arranged to promote, improve, conserve, or restore the mental or physical well-being of personnel, which include, but are not limited to, the management of Health Services resources, such as manpower, monies, and facilities; preventive and curative health measures; evacuation of the wounded, injured, or sick; selection of the medically fit and disposition of the medically unfit; blood management; medical supply, equipment, and maintenance thereof; combat and operational stress control; and medical, dental, veterinary, laboratory, optometric, nutrition therapy, and medical intelligence services. [Source: JP 4-02]

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Injury. For the purposes of this CBA, the term “Injury” is inclusive of conditions such as fractures, wounds, sprains, strains, dislocations, concussions, compressions, and psychological trauma. Injury also includes conditions resulting from extremes of temperature or prolonged exposure, acute poisonings (except those due to contaminated food) resulting from exposure to a toxic or poisonous substance, and Disease and Nonbattle Injuries, which are all illnesses and injuries not resulting from hostile action or terrorist activity or caused by conflict. [Source: Derived from JP 4-02]

Pre-hospital Care: Any care received prior to admission into a Role 2 military treatment facility. [Source: Study Team]

Prolonged Care. Also known as PC. Field medical care applied beyond “doctrinal planning timelines” by warfighters IOT decrease patient mortality and morbidity and return warfighters to combat effectiveness. PC utilizes limited resources and is sustained until the patient arrives at the next appropriate level of care or is returned to combat. [Source: Derived from the NATO definition of Prolonged Field Care]

Warfighter. For the purposes of this CBA, the term "warfighter" is inclusive of the military members of all Services (Army, Air Force, Space Force, Navy, Marine Corps), as well as those activated under appropriate authorities and policies (e.g., Coast Guard, National Oceanic and Atmospheric Administration, Public Health Service). Warfighter also includes all military working animals, Allied Forces and U.S. partners. When deployed, civilians (DoD Expeditionary Civilians) and contractors requiring protection and sustainment, or others authorized medical care are also considered warfighters for treatment purposes. [Source: Study Team]