



AEROSPACE MEDICAL QUALITY IN NATO OPERATIONS

“Get it measured, get it done”

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No conflict of interest.

Views and opinions do not necessarily represent the official position of NATO or of the ITA Air Force.



- Background in NATO = *now!*
- Quality of care = *The building blocks*
- Requirements for quality of care in the Alliance = *future?*



EFFECTIVE SUSTAINABLE SAFE



PHOTO: ARMOURED



WIDESPREAD CULTURE OF SAFETY AND QUALITY
=
ORGANIZATIONAL EFFECTIVENESS





Fundamental principles, medical issues are not specified.
Supplemented by Strategic Concepts.

The North Atlantic Treaty

NATO policies: WHAT should be done.

Policies

MC 326/4

NATO doctrine: HOW it should be done

Allied Publications

AJP-4.10(C)

Agreed recommendations for delivery of best practices (JOGs, CPGs...)

Guidelines

Single documents or respective parts relevant for the medical support.

Operational Documents
Directives – CONOPs – OPLANs – SOPs

DOCTRINE

HC QUALITY



- NATO Policy – MC 326/4

- NATO Doctrine – AJP-4.10(C)

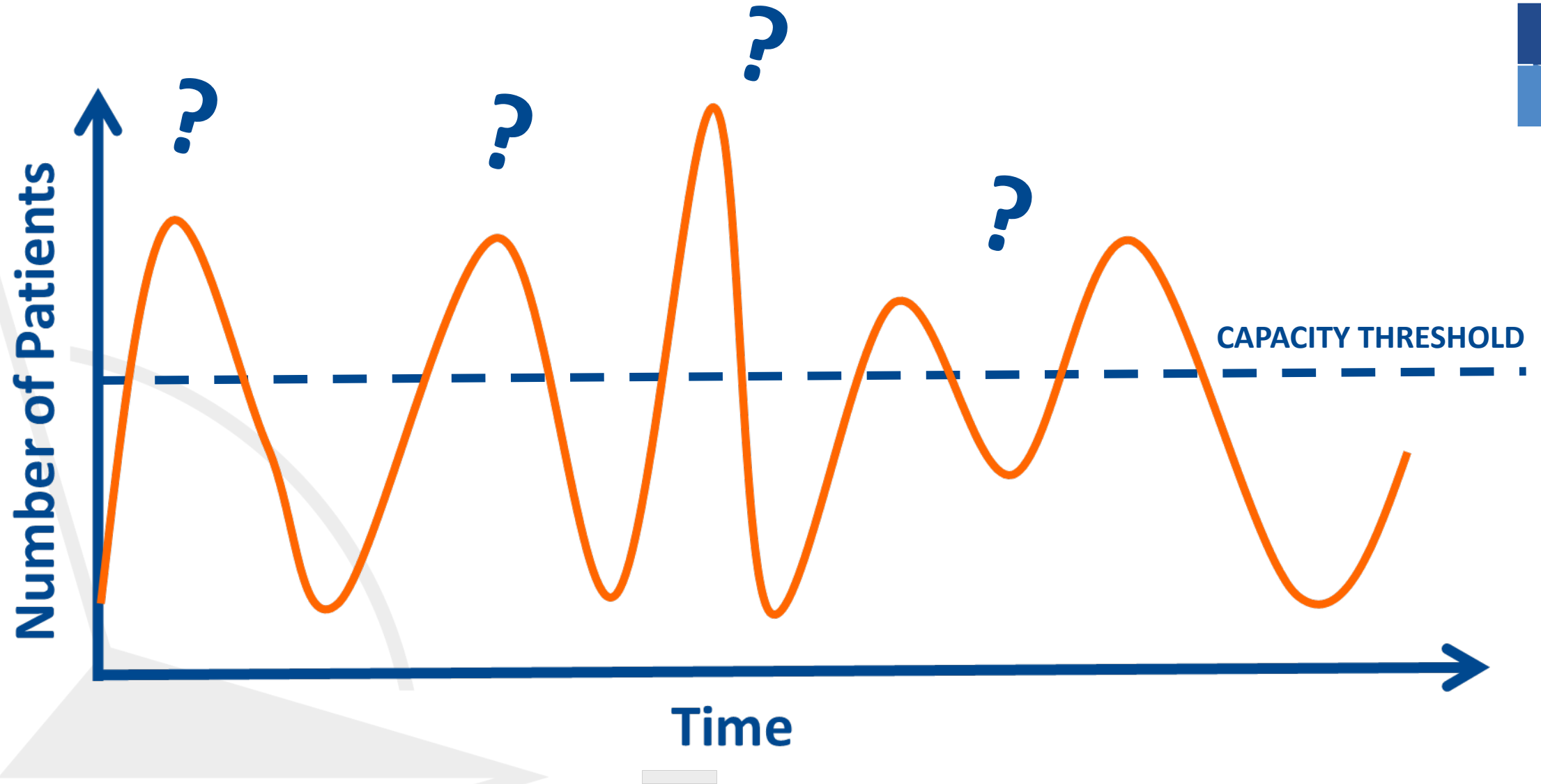


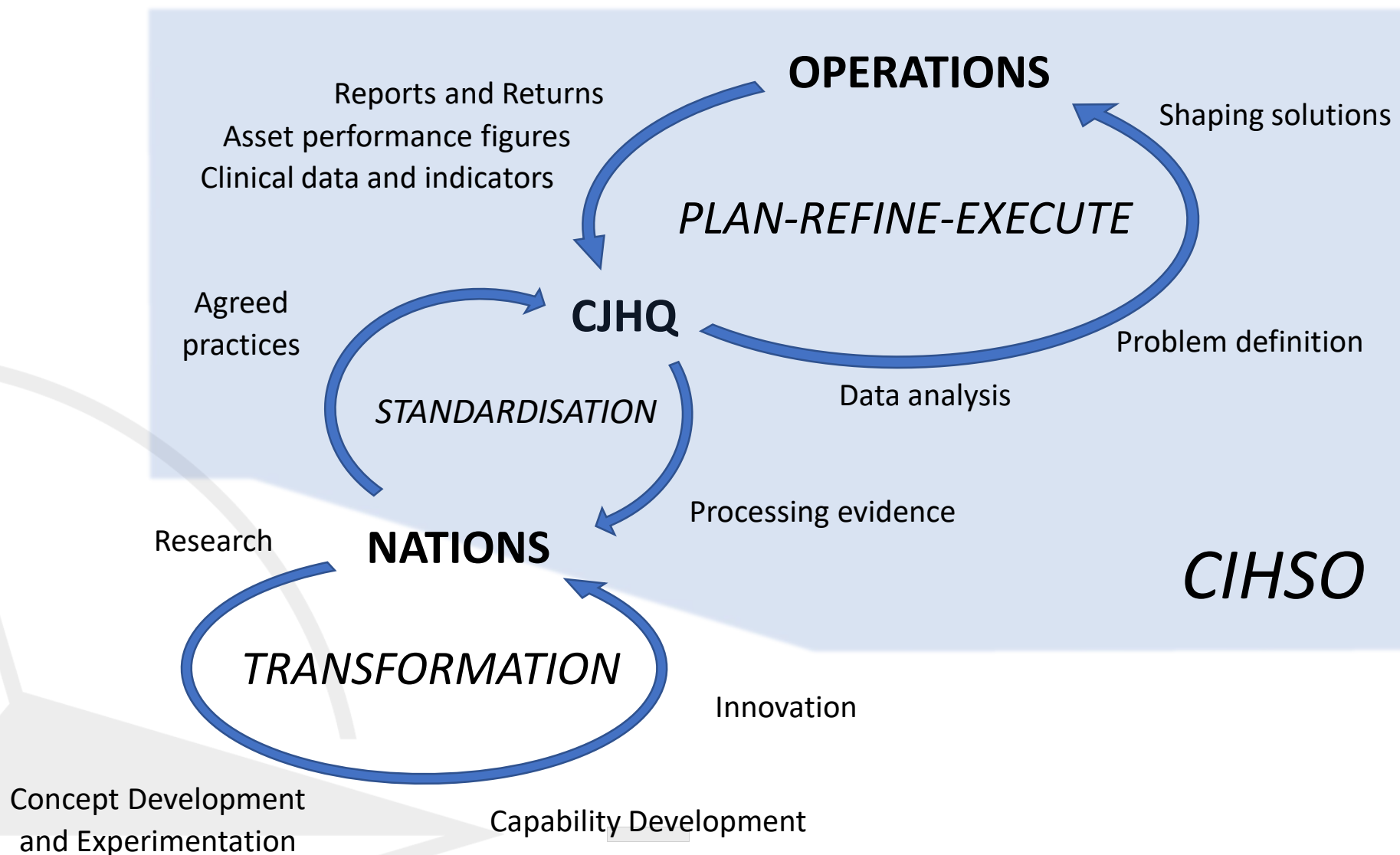


DNBIs.....MEDICAL ESTIMATE.....+BIs

AIR SUPERIORITY
REGULAR FLOWING OF AE OPS
LOW DEPENDENCY PTS

SAFETY OF AIR OPS?
SURGES IN EVACUATION REQs
HIGH DEPENDENCY PTS







MILITARY STRUCTURES are made for
MILITARY PURPOSES

BUT

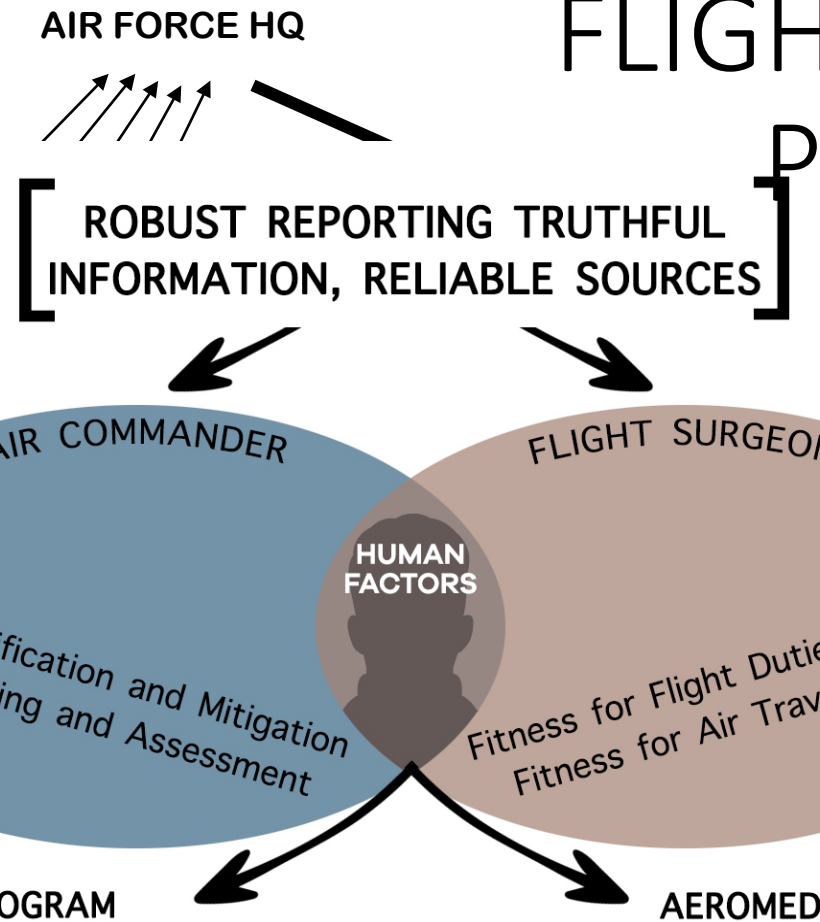
MEDICAL OPERATIONS must assure
that QUALITY of HEALTHCARE reaches
the force at risk

In compliance with NATO MEDICAL
POLICY and REQUIREMENTS

World Health Organization, OECD & International Bank for Reconstruction and Development. (2018).
Delivering quality health services: a global imperative for universal health coverage.
<https://apps.who.int/iris/handle/10665/272465>.

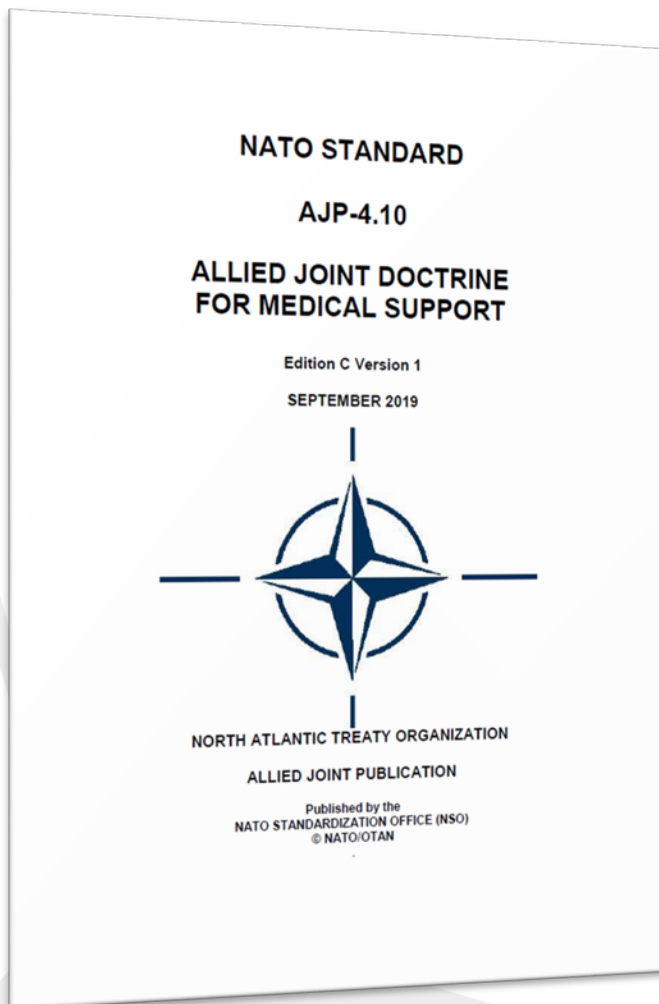


FLIGHT SAFETY PROGRAM



Flight risk management
 Exchange of flight safety information
 Improving a learning flight safety culture

Aeromedical risk management
 Sharing best aeromedical practice
 Sustaining a learning aeromedical organization

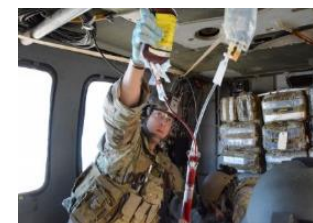


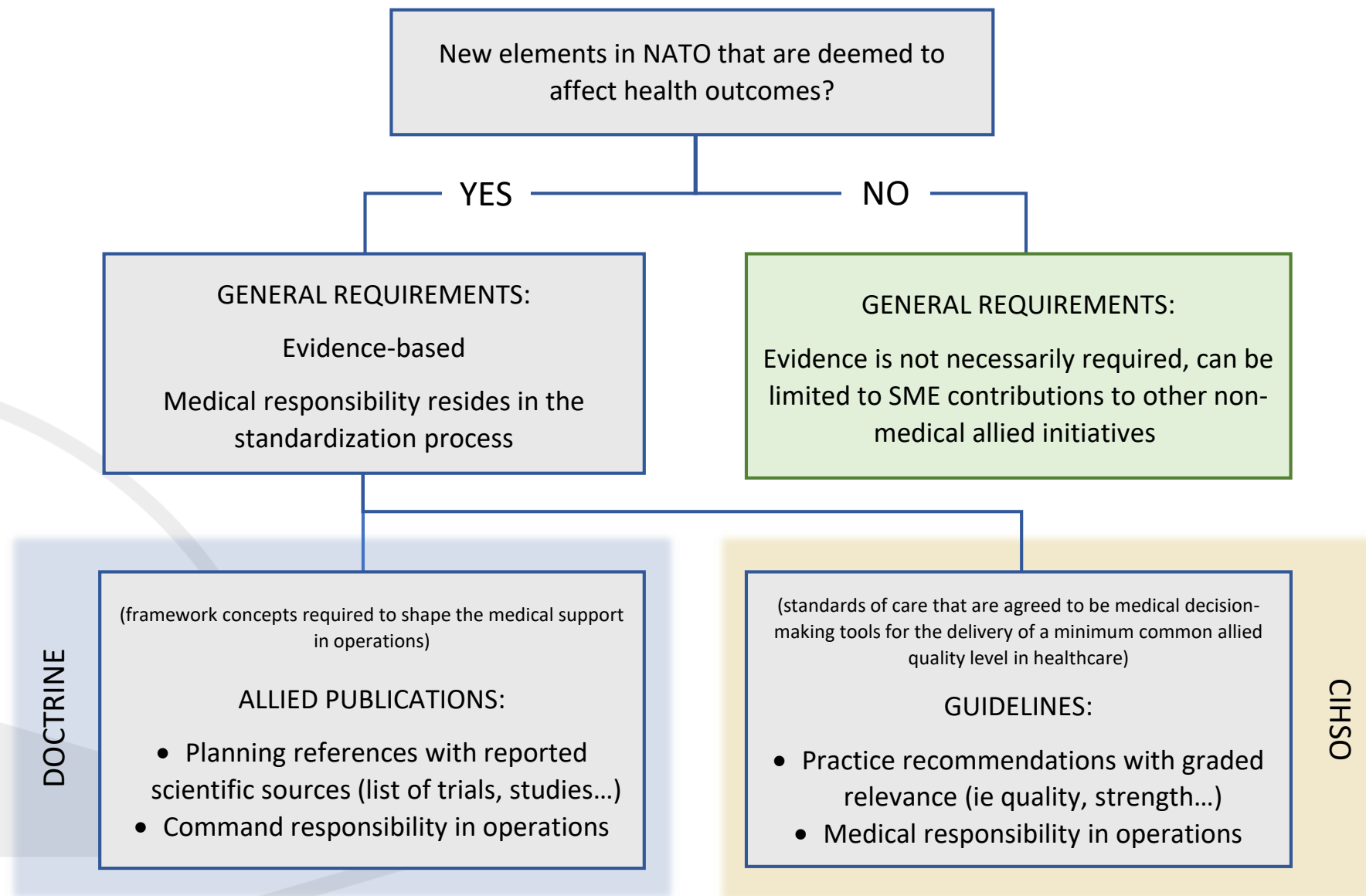
CIHSO (MC 326/4 and AJP-4.10(C))

Aeromedical governance = Sustaining best practices across changing operational requirements



10	All military personnel (medical and non-medical) should be trained and equipped for casualty care at the respective level and for the respective mission to assure effective first aid, bleeding and airway control for the most severely injured casualties within 10 minutes of injury or onset of acute symptoms.
1	Medical service personnel, qualified trained and equipped for emergency care, should be placed with or close enough to the troops they are supporting, to start advanced resuscitation and pre-hospital emergency care within 1 hour of injury or onset of acute symptoms.
2	Medical service personnel qualified trained and equipped for surgical and resuscitative emergency care should be deployed close enough to the troops they are supporting, to complement pre hospital emergency care by life limb and function preserving surgical and resuscitative procedures as soon as possible but not later than 2 hours after injury or insult. For planning purposes, allow circa 2 hours for the conduct of surgery and/or resuscitation.
(+2)	Further surgical, resuscitative, diagnostic and specialist care capabilities necessary to stabilize the patient for strategic evacuation should be made available within 2 hours of tactical evacuation after initial damage control surgery treatment.







COMBAT CASUALTY CARE

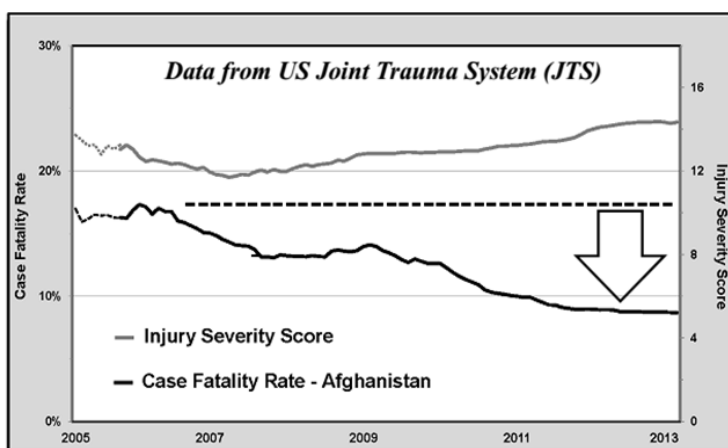
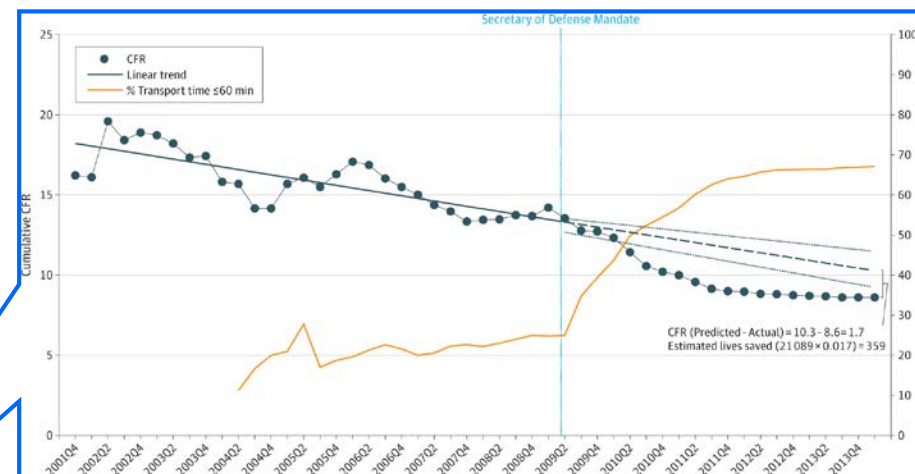
CRITICAL CARE EVACUATION

DAMAGE CONTROL

SPECIALIZED CARE

Deaths ↑

Case Fatality Rate
15,8% vs **9,4%**
 Vietnam Iraq/AFG



3-7 days to home
 En route mortality < 1%

1-3h

days/weeks

Rasmussen TE et al. *J Trauma Acute Care Surg.* 2014 Sep;77(3 Suppl 2):S55-6
 Kotowal RS et al. *JAMA Surg.* 2016 Jan;151(1):15-24
 Holcomb et al. *J Trauma* 2006. Comparison of Statistics for Battle Casualties, 1941-2005.

MAJOR TRAUMA Pathway

Blast injuries, gunshot wounds and burns

PREHOSPITAL CARE



ROLE 2 MTF



ROLE 3 MTF



NATIONAL CARE

PRIMARY CARE Pathway

Musculoskeletal injuries, common medical problems, mental health, acute syndromes

OUTPOSTS



ROLE 1 MTF



RETURN TO DUTY

COVID-19 PATHWAY



Monitor risk activities

Rapid Ag testing

- ALLOCATION OF RESOURCES,
- OPPORTUNITIES FOR IMPROVEMENT,
- MONITORING SAFETY AND PERFORMANCE,
- HARMONIZING MILITARY AND MEDICAL REQUIREMENTS.

DEDICATED MEDICAL INFRASTRUCTURE
(Isolation and Care)

Anticipated Repatriation
of High Risk Subjects



	MAJOR TRAUMA PATHWAY	PRIMARY CARE PATHWAY
Type of clinical conditions	High energy impact injuries, and their complications	Musculoskeletal injuries, common medical problems, mental health, rare acute conditions



Area of MEDEVAC operations

MOON-BASED MEDICAL SUPPORT
Evacuation to Earth within days
Storages for supplies / 3D printing
Asynchronous telemedicine

INDEPENDENT MEDICAL SUPPORT
Evacuation to Earth weeks/months
Own supply regeneration

PROTECTED ROUTES
Destination-reliant emergency services
Contingency plans to assist travelers
Information services

Station/Depot
ROLE 2

Station/Depot
ROLE 2

Medical Staging Unit

ROLE 3
Medical Landers

Lunar ROLE 1/2 Modules
Surface Evacuation Assets

ROLE 4

Planetary Medical Infrastructure

ROLE 1

ROLE 2/3*

ROLE 2/3*
Medical Staging Unit

DEEP SPACE MEDICAL SUPPORT
Evacuation to ROLE 3 in days or more
Medical selection standards for passengers
Medical virtual assistants – Virtual reality
Limited supplies and resupply capabilities

Onboard first aid

ROLE 4

EARTH RELIANT MEDICAL SUPPORT
Evacuation to Earth within hours
Supplies from Earth
Near real time telemedicine

* Customized onboard medical solution according to number of people, duration of stay and health risk profile

MILITARY AVIATION MEDICINE



TBC on Thursday afternoon!

MILITARY SPACE MEDICINE





NOW	Quality in multinational healthcare relies on having the <u>right mindset</u> and a <u>supportive organization</u> .
HEALTHCARE	Must be monitored for a <u>continuous improvement</u> in the <u>responsible application</u> of <u>shared practices</u> .
FUTURE	on Earth or in space, will be shaped around <u>multinational solutions</u> to succeed in complex medical situations with optimal quality outcomes.



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2. NATO. AJP-4.10 (Ed.C v.1) - ALLIED JOINT DOCTRINE FOR MEDICAL SUPPORT (STANAG 2228); 2019.
3. NATO. AFSP-01 (Ed.B v.1) - AVIATION SAFETY (STANAG 7160); 2018. <https://nso.nato.int/nso/>
4. US AIR FORCE. Office of the Air Force Surgeon General – Trusted Care Concept of Operations (CONOPS); 2015.
5. Veazie S, Peterson K, Bourne D. Evidence Brief: Implementation of High Reliability Organization Principles. Washington (DC): Department of Veterans Affairs (US); 2019 May.
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