NATO Blood Panel

THE 18th ANNUAL STŘEŠOVICE TRANSFUSION DAY

12 NOVEMBER 2025

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Surgery
UNIVERSITY OF TORONTO

BBC

Ukraine war: Russia hits blood transfusion centre, says Zelensky

6 August 2023

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Jaroslav Lukiv
BBC News

A Russian "guided bomb" has hit a blood transfusion centre in north-eastern Ukraine, killing two people and injuring four, Ukrainian officials say.

Volodymyr Zelensky posted an image of the building on fire as a result of Saturday night's attack around Kupiansk, in the Kharkiv region.

"This war crime alone says everything about Russian aggression," he said.

Russia has not commented. It has previously denied all allegations of targeting civilians - or war crimes.

The city of Kupiansk and nearby settlements were seized by Russian troops in the first few days of Moscow's full-scale invasion of Ukraine, launched in February 2022.

BloodP – Top three

Blood Planning – The size of the problem

1. Interoperability
2. Logistics
3. Accelerate Capability Delivery

Blood Planning – the size of the problem
Operate – Protect, engage, constrain

- Blood use adds up quickly
  - *Logistics complicated by dispersal of R2s*

6. Additional factors should also be considered:

   a. **Capacity of the medical treatment facility (MTF).** E.g. A R2E MTF (2:1:2:12) could perform a maximum of ten (10) operations a day. This is based on 2-hour surgeries and minimal down time, acknowledging this tempo would be unsustainable much beyond 24 hours. However, planning for this scenario should include at least 96 WB/WBE per 24 hours.
   b. **Casualty surge.** During an initial surge of WIA, the MTFs organic blood supply would be consumed rapidly. A surge in blood requirements could be mitigated to some extent by an appropriately scaled emergency donor panel (EDP) and/or walking blood bank (WBB) during the first days of warfighting.
   c. **Re-supply timelines**: Initial re-supply from home nations is likely to take minimum of 48-72 hours. This is likely to become extended (e.g. Maritime or loss of air superiority) and should be considered in blood planning.
   d. **Ongoing blood requirements.** A significant increase in blood supply to meet the ongoing requirements of a warfighting scenario is likely to take several weeks and significant resources. Planning for such a scenario should be recommended by national blood programs to reduce delays in providing blood producst and free up capacity in such a scenario.

10 Operations per day - R2

96 WB / WBE* per day

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R2E MTF performing 10 operations/day □ 96 WBE

Resupply over 48-72 hrs; EDP/WBB critical

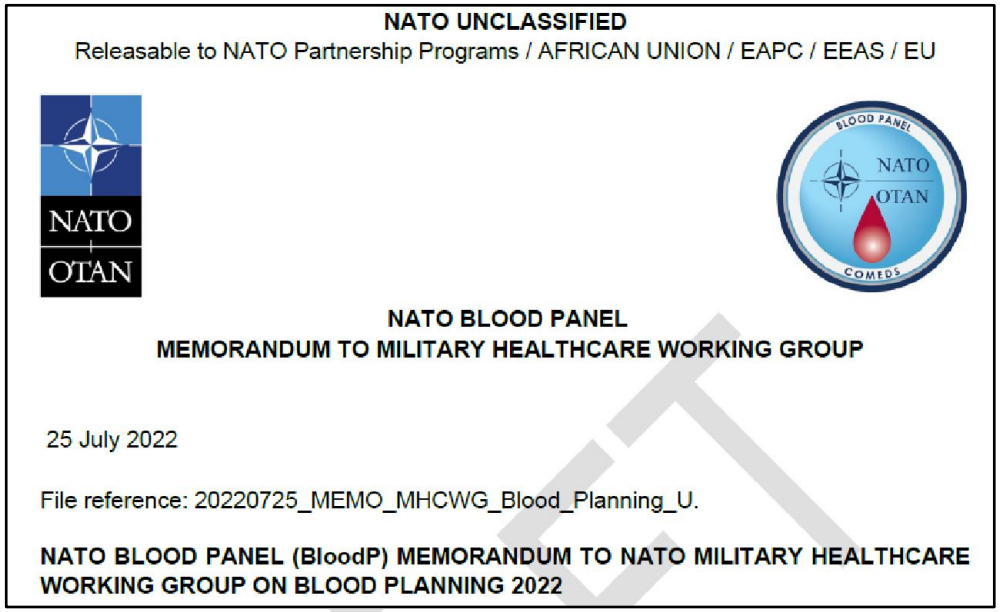
Planning with National Blood Program essential!

10 Operations per day - R2

96 WB / WBE* per day

*WBE = 1 RBC, 1 FFP, 0.2 Cryo, 0.2 Plt or 1 WB

Blood Planning – the size of the problem
Warfighting



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NATO BLOOD PANEL
MEMORANDUM TO MILITARY HEALTHCARE WORKING GROUP

25 July 2022

File reference: 20220725_MEMO_MHCWG_Blood_Planning_U.

NATO BLOOD PANEL (BloodP) MEMORANDUM TO NATO MILITARY HEALTHCARE WORKING GROUP ON BLOOD PLANNING 2022

4. The NATO BloodP makes the following recommendations for consideration by NATO COMEDS leadership: In preparation for warfighting[1], a planning factor of eight (8) units of whole blood (WB) or whole blood equivalents (WBE; 1 x red cells, 1 x plasma, 0.2 platelet, 0.2 cryoprecipitate) per hospitalized wounded in action (WIA), requiring blood products. Historically, 20% of WIA require blood products.

5. During Operate[1] (protect, engage, constrain), blood planning should be based on casualty estimate, also using blood eight (8) units of WB / WBE per casualty. Due to lower likelihood of need and logistical burden, a contingency capability (e.g. dried plasma or emergency donor panel (EDP)) could be considered to support at least one major haemorrhage casualty (10 WB or WBE) per R2/R3 MTF..

20% of casualties need blood □ count on 8 Whole Blood Equivalents (WBE) each

Need contingency options prior to full combat operations = dried plasma, emergency donor panel (EDP) / Walking Blood Bank (WBB)

- Blood use adds up quickly
  - *Up to 10000 WBE per week for major combat operations*

20% Hospitalised patients
require Transfusion

= 160 RBC, 160 FFP, 40 CRYO, 40 Plt

8 Whole Blood Equivalents (WBE*)
per transfused patient

*WBE = 1 RBC, 1 FFP, 0.2 CRYO, 0.2 Plt or 1 WB

20% Hospitalised patients
require Transfusion

= 160 WB

8 Whole Blood Equivalents (WBE*)
per transfused patient

*WBE = 1 RBC, 1 FFP, 0.2 Cryo, 0.2 Plt or 1 WB

Interoperability

	Pre-screened	Not pre-screened
Blood collected with intention to store	**Pre-screened WBB**	**Non-pre-screened WBB)***
Blood collected with intention for a known patient	**Pre-screened EDP**	**Non-pre-screened EDP***

*Table 1: Illustration of the four capabilities that can be defined following fresh whole blood collection. * Products with greater risk due to lack of pre-screening*

Starts with a common language

Minimum standards

Aim – Common HUMAN Fuel

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NATO BLOOD PANEL

MEETING RECORD

25 July 2022

ALL COMEDS MEMBERS, PARTNERS & OBSERVERS

NATO BLOOD PANEL

MEETING RECORD FROM THE SUMMER MEETING 30 JUN – 01 JUL 2022, BERGEN, NORWAY

Critical importance of donor pre-screening for EDP/WBB

6.3 The following definitions are proposed:

- **Emergency Donor Panel (EDP)**: Donor or donors from whom whole blood could be collected with intent to transfuse to a known patient.
- **Walking Blood Bank (WBB)**: Donor or donors from whom whole blood could be collected with intent for refrigerated storage (inventory).
- **Fresh whole blood (FWB):** Un-stored whole blood.
- **Cold stored whole blood (CSWB)**: Whole blood in refrigerated storage (temperature range +4°C +/- 2°C EU/UK))
- **Prescreened donor:** A donor screened and accepted following their home nations donor selection and testing criteria. This must include: donor qualification questionnaire, blood grouping (ABO) and transfusion transmitted infection (TTI) testing.

6.4 Note: Emergency Donor Panel (EDP) or Walking Blood Bank (WBB) donors should be prescreened to reduce the risk to both donor and recipient. In extreme situations where no alternative is available, non-pre-screened donors can be considered. The minimum requirements for a pre-screened EDP/WBB have been agreed by the BloodP at a previous meeting (Norway 2019).

6.5 All WB units collected from EDP or WBB (prescreening or not) is untested product. As such, there is a greater risk (e.g., from TTI) than with tested products. Rapid point of care TTI testing may be done for risk mitigation.

6.6 Blood collected from EDP if unused can be stored (subject to local policy) in the cold.

COMMON FUEL

Oil well
crude oil extracted

Transport

Oil refinary
multiple fuels
Aviation fuel
Diesel
Petrol

Packaging & transport

COMMON HUMAN FUEL

Donor
Questonairre
Testing

Donor
Anticoagulant
Bag

Transport

Manufacturing
Multiple blood components
Red cells, FFP,
Platelets,
whole blood

Transport
Blood Bank storage

Transfusion
Qualifications of HCP

Interoperability

NATO STANDARD

AMedP-1.1

MINIMUM REQUIREMENTS FOR BLOOD, BLOOD DONORS AND ASSOCIATED EQUIPMENT

Edition 1 Version 1

February 2025

CHAPTER 1.

1.1 AIM

The aim of this agreement is to facilitate interoperability among NATO Forces through a Common Blood Concept, which includes:

1.1.1 A regulatory framework to enable the provision of blood and blood components as near to the point of need as practicable.

1.1.2 To allow blood and blood components to be exchanged between NATO Forces, by introducing minimum requirements for blood donation, testing, processing, labelling, transport, storage, and traceability.

1.2 PARTICIPATING NATIONS AGREE:

1.2.1 That blood and blood components used for transfusion by or in support of NATO will be collected, tested, processed, labelled, transported, stored, and tracked in compliance with the requirements described in this agreement.

1.2.2 To adopt standardised equipment, in form, fit and function, to facilitate collection and transfusion of blood and blood components.

Interoperability

1.6 CATEGORIES OF BLOOD AND BLOOD COMPONENT SOURCES The following three categories relate to the system from which blood and blood components are sourced.

a. **Category 1 blood**. Blood and blood components manufactured by NATO and PIAG[1] nations' licensed and/or registered blood establishments.

b. **Category 2 blood.** Blood and blood components collected in an Area of Operations by NATO and PIAG Nations in compliance with the related document.

c. **Category 3 blood**. Blood and blood components **not** collected and processed by NATO or PIAG Nations.

1.6.1 Each category of blood and blood components has a different risk profile which should be considered when planning Operations. Considerations include; infection risk, clinical effectiveness, logistic constraints and estimated Operational requirement.

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Interoperability

STANDARDS RELATED DOCUMENT

SRD AMedP-1.1-1

Operational Blood Supply Minimum Standards and Toolkits

Edition A Version 1

Feb 2025

CHAPTER 3. PLANNING CONSIDERATIONS FOR OPERATIONAL BLOOD SUPPLY

3.1 Purpose

This chapter is intended to provide guidance for efficient and effective blood supply on Operations.

3.2 Scope

This chapter relates to blood and blood component supply. Critical adjuncts to transfusion such as tranexamic acid (TXA), Intravenous calcium and blood products regulated as pharmaceuticals must be considered alongside, supported by evidence based clinical guidelines

ANNEX 6. SAMPLE DONOR CONSENT FORM

EMERGENCY BLOOD COLLECTION

An Emergency Blood Collection (EBC) has been activated to provide Fresh Whole Blood (FWB) for a critical clinical need.

You have been selected to be a donor because you were a previously a volunteer and have tested negative for all relevant screening tests and have agreed to be part of the Emergency Donor Panel.

To be a donor today you must:

Be a volunteer

Feel well

Complete a Health Screening Questionnaire

Consent for blood samples to be screened retrospectively

This is a voluntary process and if you do not wish to continue you can leave at any time.

Health Screening Questionnaire

The Health Screening questionnaire covers your personal lifestyle, medical history and recent travel history.

All questions must be answered honestly.

Informed Consent

You will need to complete and sign the Health Screening Questionnaire to confirm that you understand the process and consent to blood screening being undertaken.

If you do not fully understand, please ask.

Questionnaire Review

Trained personnel will review your responses and decide whether you can be a donor today.

Risks of Blood Donation

Donating Whole Blood is not totally risk free the following may occur:

Fainting – 1 in 55

Bruising / Haematoma – 1 in 200

Arterial bleed – 1 in 12,500

This is a voluntary process and if you do not wish to continue you can remove consent at any time, even after the bleeding process.

Blood tests

In addition to the whole blood donation blood samples may be taken and tested for:

- Hepatitis B, C & E
- Syphilis
- HTLV
- Malaria
- HIV

Personal information

We are committed to protecting the confidentiality of donors and to meet our responsibilities under the Data Protection Act

A record of all completed questionnaires and results of any tests securely for at least 30 years.

If you do not understand any part of the process, ask the EDP administrator.

Interoperability

National Blood Surveys :

- REDCAP survey tool –Blood product/adjunct availability by conventional/SOF

Interoperability:

- US developed survey based on WHO blood safety assessment methodology
  - Used to certify blood supply as “FDA equivalent” for US policy purposes
  - Tool may be useful for other nations

Major NATO data priority :

- Require information available on national donor pool surge capacity

Logistics

- Surge Capacity – not just blood
- Stockpiling
- Civ – Mil blood Supply dependence

6. Additional factors should also be considered:

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COMMON HUMAN FUEL

Donor
Questonairre
Testing

Donor
Anticoagulant
Bag

Transport

Manufacturing
Multiple blood components
Red cells, FFP, Platelets, whole blood

Transport
Blood Bank storage

Transfusion
Qualifications of HCP

Scorer T 2022

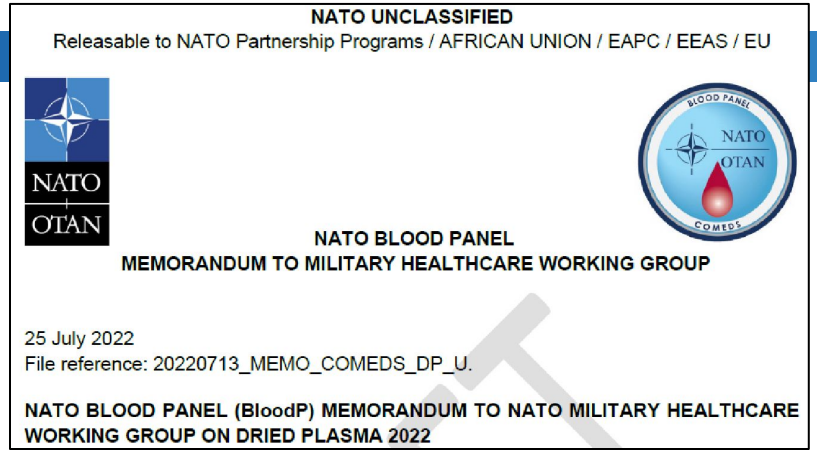
Accelerate Capability Delivery

Dried Plasma

- **Major deficiency in DP availability in NATO**

- **Must expand available production**
- **Must accelerate regulatory approval for new products**
- **Must commit to procure DP to build viable industrial base**

DP □ the essential contingency product until WBE available at scale



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NATO BLOOD PANEL
MEMORANDUM TO MILITARY HEALTHCARE WORKING GROUP

25 July 2022
File reference: 20220713_MEMO_COMEDS_DP_U.

NATO BLOOD PANEL (BloodP) MEMORANDUM TO NATO MILITARY HEALTHCARE WORKING GROUP ON DRIED PLASMA 2022

Recommendations

5. The NATO BloodP makes the following recommendations for consideration by NATO COMEDS leadership:
   a. COMEDS should strongly encourage nations that currently produce DP products to develop contingency plans to rapidly expand to their maximum production capacity.
   b. COMEDS should strongly encourage member nations to accelerate regulatory approval of DP products in order to increase available supply to the NATO force. This should include military specific approvals, emergency use authorizations, extension of shelf life or other waivers depending upon National authorities
   c. Nations that can commit to procurement of DP units, based on desired volume during normal operations, should do so in order to facilitate market demand and accelerate industry engagement.
   d. Member Nations should develop own national production of DP to meet their national requirements.

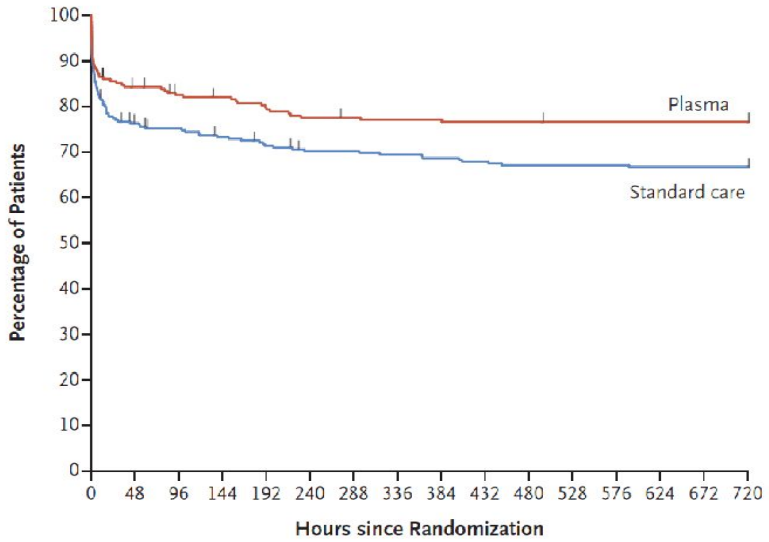
Why dried plasma?

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JULY 26, 2018 VOL. 379 NO. 4

Prehospital Plasma during Air Medical Transport in Trauma Patients at Risk for Hemorrhagic Shock

J.L. Sperry, F.X. Guyette, J.B. Brown, M.H. Yazer, D.J. Triulzi, B.J. Early-Young, P.W. Adams, B.J. Daley, R.S. Miller, B.G. Harbrecht, J.A. Claridge, H.A. Phelan, W.R. Witham, A.T. Putnam, T.M. Duane, L.H. Alarcon, C.W. Callaway, B.S. Zuckerbraun, M.D. Neal, M.R. Rosengart, R.M. Forsythe, T.R. Billiar, D.M. Yealy, A.B. Peitzman.



No. at Risk							
Plasma	230	183	172	170	169	168	168
Standard care	271	194	181	179	173	172	172

DP □ Proof of concept validated

Can stockpile

Buys time until WBE resuscitation available

Recommendations

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Accelerate Capability Delivery

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11 October 2025 BRIEF(DIV)-0000-yyyy

FOOD-FOR-THOUGHT PAPER

COMEDS NATO BLOOD PANELMEMORANDUM TO COMMITTEE OF THE CHIEFS OF MILITARY MEDICAL SERVICES

Reference:

A. File reference: 20251011_MEMO_COMEDS_DP_U., COMEDS NATO Blood Panel Memorandum to COMEDS in NATO on Dried Plasma, 10 October 2025.

SETTING THE SCENE

1. Dried plasma (DP) is critical for battlefield haemostatic resuscitation. Current worldwide manufacturing capacity is critically insufficient to meet projected NATO demand for Large Scale Combat Operations (LSCO).

2. The DP requirement to support LSCO is estimated at up to 3,200 units per 1,000 total wounded in action (WIA).

Accelerate Capability Delivery

DISCUSSION

13. Without immediate action, NATO's DP supply will remain inadequate to support LSCO. Reliance on limited existing production and delayed licensing of decentralised systems presents a strategic vulnerability in battlefield resuscitation capabilities.

14. Addressing these supply gaps requires coordinated investment in both centralised and decentralised DP manufacturing, stockpiling, and consumable generation to meet projected operational requirements.

PROPOSAL(S)

15. Immediate investment in DP production facilities in NATO and partner nations, expansion of decentralised systems, and guaranteed procurement agreements with manufacturers such as Velico and Teleflex™.

16. Establish a stockpiling strategy that accounts for projected LSCO requirements plus at least two resupply cycle.

Accelerate Capability Delivery

https://doi.org/10.35754/0234-5730-2025-70-1-62-84

СУХАЯ ПЛАЗМА: ВПЕРЕД В ПРОШЛОЕ

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РЕЗЮМЕ

Введение. Сухая плазма применяется уже более 80 лет. За это время отношение к ней менялось — от широкого признания во время Второй мировой войны до полного запрета в послевоенном периоде и возобновления производства в последние годы.
Цель: анализ данных литературы о производстве, безопасности, качестве, хранении и клинической эффективности сухой плазмы.
Основные сведения. Приводится историческая справка применения сухой плазмы, анализируется состав сухой плазмы в зависимости от метода производства, регидратации, длительности хранения и редукции патогенов. Приводятся сведения о клиническом применении и эффективности сухой плазмы, в том числе концентрированной сухой плазмы.

RUSSIA IS INTERESTED!

Рисунок 4. Лиофилизатор мобильный камерного типа «Лиомед®» (фотография авторов)
Figure 4. *Mobile chamber-type lyophilizer Liomed® (author's photo)*

Рисунок 5. «Лиоплазма®» — комплект с отечественной лиофилизированной плазмой, содержащий в вакуумированной упаковке контейнеры с сухой плазмой и регидратирующим раствором, трансфузионную систему и соединитель контейнеров
Figure 5. *Lyoplasma — a kit with domestic lyophilized plasma, containing in evacuated packaging containers with dry plasma and regenerating solution, a transfusion system and a container connector*

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Discussion & Recommendations

1. Interoperability – Adopt Common ‘human’ fuel standards (Blood)
   - Definitions
   - Minimum testing, product handling standards
   - EDP/WBB standards, training
2. Logistics – Surge Capacity & Supply Chain management
   - Perform supply chain vulnerability & surge capability assessment
   - Stockpiling (National and Centralized): blood collection, storage, testing material
3. Accelerate Capability Development
   - Dried Plasma
   - EDP/WBB: civilian & military donor recruitment, training

Questions


BLOOD PANEL
NATO
OTAN
COMEDS


18.
THE 18TH ANNUAL
STŘEŠOVICE
TRANSFUSION DAY
STATES OF EMERGENCY
AND CRISIS BLOOD
POLICY