# STANDARDS RELATED DOCUMENT

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# BLOOD PROGRAMMES OF NATO NATIONS

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**NORTH ATLANTIC TREATY ORGANIZATION**

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**NATO STANDARDIZATION OFFICE (NSO)**

**NATO LETTER OF PROMULGATION**

3 September 2018

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Zoltán GULYÁS
Brigadier General, HUNAF
Director, NATO Standardization Office

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# CHAPTER 1 BELGIAN BLOOD PROGRAMME (BEL)

## 1.1 Concept of operations

Organization

1.1.1 Military

The sole military BTC is located in the Queen Astrid Military Hospital in Brussels. Produced blood components are provided to military hospital care units, to operational units on deployment and to civilian hospitals experiencing inventory problems. All the blood is collected in the Military Service for Blood Transfusion (MSBT) from volunteer donors of the Defence Department. The blood collecting team is mixed, military and civilian, and is under the supervision of a medical officer. Each donor completes a medical questionnaire and total blood volume and haematological parameters are monitored before donation. All blood components are collected by aphaeresis. The standard donation is either 300 ml of absolute red blood cells or 630 ml of plasma or 8x10E11 platelets with saline compensation or since 2014 150 ml absolute red blood cells plus 4x10E11 platelets without saline compensation. Annual 3000 aphaeretic donations produce approximately 6000 units.

1.1.2 Blood components produced by the MSBT are:

Red Blood Cells – leukocytes removed (ACDA-SAG-M) stored at +2 to +6°C for 42 days;
Pathogen-reduced Fresh Frozen Plasma (ACDA) stored at -80°C for 1 year.
Pathogen-reduced Single Donor (4x10E11) Platelets (ACDA-T-PAS+) stored at +20 to +24°C for 7 days;

## 1.2. Civilian

Whole blood collection is almost completely delegated to the Red Cross. The Red Cross system has 2 BTC which have own territory for collection and distribution of blood. The Red Cross fractionation plant in Brussels is responsible for the production of stable blood derivatives from plasma.

## 1.3 Collections

In the civilian sector approximately 75% of blood is collected by mobile collection teams. Donor examination include medical questionnaire, blood pressure and pulse rate. Age range is 18 to 70 years. Blood is collected by physicians and nurses under the supervision of a physician. Donors may donate 4 times a year. The standard donation is 450 ml. Annual whole blood donations are 600000 units together with 250000 plasma- and cytapheresis procedures. The Red Cross has limited red blood cells freezing capability in Antwerp en Liège. Standard cross match procedures and / or type and screen are performed on blood prior to transfusion.

### 1.4 Blood components produced by the Red Cross:

Red Blood Cells – Leukocytes Removed (CPD-SAGM) stored at +2 to +6°C for 42 days;
Pathogen-reduced and Quarantine Fresh Frozen Plasma (CPD or ACDA) stored at -30°C for 1 year;
Pathogen-reduced Pooled Platelets (CPD-Intersol) stored at +20 to +24°C for 7 days;
Pathogen-reduced Single Donor (4x10E11) Platelets (ACDA-Intersol) stored at +20 to +24°C for 7 days;
Pooled Platelets – Leukocytes Removed (CPD) stored at +20 to +24°C for 7 days;
Single Donor (4x10E11) Platelets – Leukocytes Removed (ACDA) stored at +20 to +24°C for 7 days.

### 1.5 Licensure (Accreditation) / Guidelines

Both military and civilian BTC follow national and Council of Europe guidelines, participate in the Belgian National BTC control program and are accredited by the Ministry of Health.

### 1.6 Paid donors / Volunteer donors

In Belgium, all donors are unpaid and volunteer.

### 1.7 Testing

In the MSBT the following tests are carried out :

- ABO, Rhesus and Kell blood groups
- Extended phenotype of blood group O Rhesus-negative donors
- Hemoglobin and complete blood cell count
- Irregular and auto-antibodies screen
- HIVp24 antigen, HIV 1, 2 & TO antibody and RNA screen
- Hepatitis B surface antigen, core total antibody and DNA screen
- Hepatitis C antibody and RNA screen
- Cytomegalovirus IgG antibody screen
- Syphilis antibody screen by ELISA
- Human T-Lymphotropic Viruses I & II antibody screen

In the Red Cross the following tests are carried out:

- ABO and Rhesus D blood groups
- Hemoglobin and complete blood cell count
- Irregular antibodies screen (first donation)
- HIVp24 antigen, HIV 1, 2 & TO antibody and HIV-1 RNA screen
- Hepatitis B surface antigen and DNA screen
- Hepatitis B core total antibody screen (first donation)
- Hepatitis C antibody and RNA screen
- Syphilis antibody screen by VDRL / TPHA

## 1.8 Shipping and monitoring

There is a system of blood transfusion records to track and trace blood components from recipient to donor (Haemovigilance / look-back). The ISBT 128 code is implemented.
In the military there is a system of individual blood component bags temperature follow-up.

## 1.9 Points of Contact

1.9.1 Military

Defense Headquarter – Medical Component Command
Queen Elisabeth Quarter – Evere Street
1140 Brussels – Belgium
00-32-2-7013301
Military Service for Blood Transfusion
Queen Astrid Military Hospital – Bruyn Street
1120 Brussels – Belgium
00-32-2-2644680
Civilian
Via Defense Headquarter – Medical Component Command

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# CHAPTER 2 CANADIAN BLOOD PROGRAMME (CAN)

## MILITARY BLOOD PROGRAMME

### 2.1 Concept of Operations

2.1 All blood products are provided by the Canadian Blood Services. Blood is provided to military hospitals in Canada by the Canadian and Héma-Québec Blood Services and outside Canada through the CAF Blood Distribution System.

### 2.2 Military Blood Bank Procedures

2.2.1 Collections Nil.

2.2.2 Processing Nil.

2.2.3 Components Nil.

2.2.4 Storage in Wartime
Blood will be stored under the control of military Laboratory Technicians in medical grade refrigerators or thermal stabilizers at a temperature between 2°C and 6°C.

2.2.5 Distribution in Wartime
Canadian Armed Forces transports blood received from Canadian Blood Services in passive (iceless) temperature controlled containers between 2oC and 6oC with electronic temperature recording devices located with the shipment. Monitoring of the movement of blood products is conducted by CAF Health Services Medical Supply and Laboratory personnel.

2.2.6 Special Techniques
The National Reference Laboratory of the Canadian Blood Services functions as the World Health Organisation (WHO) National Blood Group Reference Laboratory, and, in this capacity, takes part in international proficiency surveys. Frozen red cell operations, apheresis, and human leucocyte antigen testing are performed in several centres.

2.2.7 Transfusion Practices
Red cell concentrates, plasma solutions, platelets and cryoprecipitate are routinely used for transfusions. A standard cross match is performed on blood.

2.2.8 Points of Contact Director Health Services Operations
Canadian Forces Health Services Group
60 Moodie Dr
Ottawa, Ontario, Canada
K1A 0K2
Tel: 001-613-901-9889

J4
Canadian Forces Health Services Group
60 Moodie Dr
Ottawa, Ontario, Canada
K1A 0K2

## 2.3 Civilian Organizations

2.3.1 Blood collections in Canada are delegated to the Canadian Blood Services and Hema-Quebec. The Canadian Blood Services is divided into seven regions and contains 17 blood centres. These centres are linked together by computer. Plasma fractionation is contracted with civilian fractionators.

## 2.4 Civilian Blood Bank Procedures

2.4.1 Collections
The blood donor centre is the primary site of blood collections. Some centres operate mobile collection units. Minimum screening and examination include medical questionnaire, blood pressure, pulse, haemoglobin and weight.

2.4.2 Age range is normally 17 - 71 years of age and less than 60 years old for first time donation. Blood is collected by nurses under the indirect of a physician. Blood is collected in plastic bags that contain Citrate-Phosphate-Dextrose-Adenine (CPDA-1) Donors may donate up to six times a year. Few donors fall under this number but they are assessed for their suitability to donate at each donation and can be deferred for 56 days depending on hemoglobin level. The standard donation is 450 mls. All donors are volunteers. Annual whole blood donations are approximately 1,200,000.

2.4.3 Processing

Most procedures are automated. The following tests are carried out:

2.4.3.1 ABO and Rhesus.
2.4.3.2 VDRL and ART for syphilis.
2.4.3.3 HBs-Ag.
2.4.3.4 Anti-HCV.
2.4.3.5 Anti-HIV 1&2.
2.4.3.6 MPX NAT Testing (HCV RNA, HIV RNA, HBV DNA)
2.4.3.7 Anti-HTLV 1&2.
2.4.3.8 West Nile Virus NAT
2.4.3.9 Anti-HBc
2.4.3.10 Chagas (T. cruzi; ELISA)

2.4.4 There are immunology reference laboratories in most blood centres. Blood donor testing reveals a positive hepatitis rate of approximately 0.3% among prospective donors.

2.4.5 Components
Most blood centres produce blood components. Plasma fractions are also available for distribution to hospitals as required.

2.4.6 Blood Products Maximum Expiration Period

| | |
|---|---|
| Red Cells (CPDA-1) | 35 days. |
| Fresh Frozen Plasma (-30°C) | 12 months. |
| Platelets 7 | 5 days |
| Cryoprecipitate | 12 months. |

2.4.7 Storage
Blood products are stored in refrigerators, freezers, or on rotators

2.4.8 Blood Products Minimum Temperature Range

| | |
|---|---|
| Red Cells | 1°C - 6°C. |
| Fresh Frozen Plasma | -30°C. |
| Platelets | 20°C - 24°C. |
| Cryoprecipitate | -30°C. |

2.4.9 Distribution
Blood is transported in polystyrene boxed to service hospitals. Frozen ice packs are used to collect blood. Transportation temperature range is generally 1-10 C. Transportation mode includes blood bank vehicles, trains and air transportation.

2.4.10 Special Techniques
The National Reference Laboratory of the Canadian Blood Services functions as the World Health Organization (WHO) National Blood Group Reference Laboratory, and in this capacity, takes part in international proficiency surveys. Frozen red cell operations, apheresis, and human leukocyte antigen testing are performed in several blood centres.

2.4.11 Transfusion Practices
Standard cross match procedures are performed on blood. About 90% of transfusions are concentrated red cells.

## 2.5 Points of Contact

Director – Regulatory Affairs
Canadian Blood Services
1800 Alta Vista Drive
Ottawa
K1G 4J5
Canada
Tel: 001-613-739-2300
Executive Director
Canadian Blood Committee
8th Floor, Jeanne Mance Bldg
Tunney's Pasture
Ottawa

K1A 1B4
Canada
Tel: 001-613-992 7351

# CHAPTER 3 CZECH BLOOD PROGRAMME (CZE)

## Civilian Organizations

## 3.1 Concept of Operations

Blood collections and blood processing in Czech Republic are delegated to the thick hospital network. Many hospitals have special departments for blood transfusion (and haematology). There are total 71 blood transfusion facilities, 53 of them are blood collections and blood processing centres, 18 blood collection centres only. Moreover, there are 11 commercial plasmapheresis centres (operating by 4 private companies).

The regulatory state authority is State Institute for Drug Control (Státní ústav pro kontrolu léčiv, SÚKL), member of PIC.

### 3.1.2 Procedures

#### 3.1.2.1 Collections

Annual donations: 420000 whole blood (100 % no remunerated), 15000autologus whole blood, 18000 thrombocytapheresis (34% no remunerated) and 650000 plasmapheresis (25 % no remunerated). Donors are appreciated by the Czech Red Cross. Minimum donor screening and examination include the questionnaire, blood pressure, pulse, body temperature and haemoglobin. Age range is normally: 18-65 years. Blood is collected by nurse in plastic bags that contain Citrate-Phosphate-Dextrose-Adenine (CPDA-1); the multiple bags are with various additive solutions (SAG-M, ADSOL etc.)., 20-30 % RBCs are leukodepleted. The standard whole blood donation is 450 ml. Donors may donate whole blood five times a year (male) or four times a year (female).

#### 3.1.2.2 Processing and Components

There is a mixture of automated and manual procedures. Obligatory tests are: AB0 blood groups + Rh(D) + antibody screens. Most of facilities test next Rhesus antigens (C, c, Cw, E, e) and Kell. Infectiousness: HIV 1/2 ab + Ag p24., HBs-Ag, HCV ab., tests for syphilis, military blood transfusion centre test additionally NAT HIV, NAT VHB, NAT VHC, NAT VHA and NAV PV-B19. Every blood transfusion centres produce blood components, most of these red cell buffy-coat removed and fresh frozen plasma. Autologous blood in most case is like whole blood. Totally, plasma produce is about 600.000 l / year, 100.000 l are for clinical use (6-month quarantine) and next for industry.

##### 3.1.2.2.1 Blood Products Maximum Expiration Periods

| | |
|---|---|
| Red Cell (CPDA-1) | 35 days |
| Red Cell (SAG-M, ADSOL) | 42 days |
| Fresh Frozen Plasma | 36 month |
| Platelets | 5 days |

3.1.2.2.2 Storage of Blood Products

Blood products are stored in refrigerators, freezers, or on agitators.
Storage temperature must be monitored and recorded.

| | |
|---|---|
| Red Cell | 2 – 6 °C |
| Fresh Frozen Plasma | -25°C and below |
| Platelets | 20 – 24 °C |

3.1.3 Distribution

Blood products are transport in validated (or as well monitored) isotherm boxes by cars.

3.1.4 Special Techniques

Special centre with bone marrow transplantation programme collect bone marrow or stem cells by apheresis and frozen these. Frozen red cells program is located in Central Military Hospital Prague.

3.2.5 Transfusion Practices

Standard crossmatch procedures are performed on blood. Most of transfusions are concentrated red cells. Physicians have to perform an additional bedside cross match before blood transfusions (check AB antigens by donor and patient). Only one facility makes the computer cross match (Central Military Hospital Prague).

## 3.2 Civilian Points of Contact

Ministry of Health of Czech Republic
Ministerstvo zdravotnictví ČR
Palackého nám. 4
128 01 Praha 2
tel.: +420-224971111
fax: +420-224972111
e-mail: mzcr@mzcr.cz

State Institute of Drug Control
Státní ústav pro kontrolu léčiv
Šrobárova 48
100 41 Praha 10
tel./ fax.: +420-2721851111
+420-255726111
e-mail: posta@sukl.cz

Czech Red Cross
Český červený kříž.

Thunovská 18
118 04 Praha 1
tel.: 00420-251104111
fax: 00420-251104265
e-mail: info@cervenykriz.eu

## 3.3 Military blood programme

3.2.1. Concept of Operations

Czech Republic has one military blood transfusion facility: the Department of Haematology and Blood Transfusion of Central Military Hospital – Military University Hospital Prague (CMH), those are operated by Ministry of Defence. This works as territorial military blood bank, is responsible for blood supply of CMH as well as of some civilian hospitals, is responsible for blood supply of field hospitals in foreign missions, research base in blood transfusion, works as national strategic blood bank (frozen red cells, frozen platelets), works as central logistic and information center for the system of national blood crisis policy, processes ca. 20000 blood and plasma collection / year. Blood donors are military (10%) and civilians (90%).

The military blood transfusion facility operates according the same rules as civilians.

3.2.2 Procedures

3.2.2.1 Collections

All blood donors are volunteers, rules for donors screening a collections of blood are the same like in civilian blood transfusion service.

3.2.2.2 Processing and components

There is a mixture of automated and manual procedures, 100% RBCs are leucodepleted. Obligatory tests are identical with civilian blood transfusion service, plus additionally NAT HIV, NAT VHB, NAT VHC, NAT VHA and NAT PV-B19.

3.2.2.2.1 Blood Products Maximum Expiration Periods

| | |
|---|---|
| Red Cell (CPDA-1) | 35 days |
| Red Cell (SAG-M, ADSOL) | 42 days |
| Fresh Frozen Plasma | 36 month |
| Platelets | 5 days |
| Frozen Red Cells reconstitution in AS-3 (Nutricel) | 30 years / 21 days after thawing and |

3.2.2.2.2 Storage of Blood Products

Storage temperature must be monitoring and

| | |
|---|---|
| Red Cell | 2 – 6 °C (refrigerator) |
| Fresh Frozen Plasma | -25°C and lower (freezer) |
| Platelets | 20 – 24 °C (isotherm box with agitator) |

Frozen RBCs and PLTs -65°C and lower (freezer)

3.2.3 Distribution

Blood products are transport in isotherm boxes by cars to hospitals. For log transport distance (army missiles abroad) are used active isotherm boxes, plasma is transport in dry ice.

3.2.4 Special Techniques

Cryopreservation of red cells and platelets, hollow fibre separation of whole blood in operations.

3.2.5 Transfusion Practices

In Central Military Hospital Prague: serological (20%) or computer (80%)cross-match

In field hospital: Serological cross-match by column agglutination system.

Physicians have to perform an additional bedside cross-match before blood transfusions (check AB antigens by donor and patient).

## 3.4 Military Points of Contact

Bureau of Military Health Service,
Odbor vojenského zdravotnictví
Ministry of Defence Czech Republic
Ministerstvo obrany ČR
Pohořelec 121/21
160 05 Praha 6
Tel.: +420-973202012
Fax: +420-
e-mail: starkovh@army.cz

Department of Hematology and
Blood Transfusion
Central Military Hospital -
Military University Hospital Prague
U Vojenské nemocnice 1200
169 02 Prague
tel.: +420-220203210
fax.: +420-224314208
e-mail: bohonmil@uvn.cz

Oddělení hematologie a
krevní transfuze
Ústřední vojenská nemocnice –
Vojenská fakultní nemocnice
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# CHAPTER 4 DANISH BLOOD PROGRAMME (DNK)

## MILITARY BLOOD PROGRAMME

### 4.1 Concept of Operations

4.1.1 Denmark has no peacetime military blood programme. Military patients are transfused in civilian hospitals. Military personnel regularly donate blood to civilian blood centres. Denmark uses exclusively blood from civilian blood banks. The regulations for civilian blood procurement are in accordance with those given in STANAG 2939.

Para. 5 The Danish identity card and identity tags issued after January 1999 will not show the blood group for the bearer.

Para. 9 The blood group will in Denmark be given in black letters on a white background.

4.1.2. Points of Contact

Director General Medical Services
PO Box 202
DK 2950 Vedbaek
Denmark
Tel: 42-890501
Defence Medical Training Centre
DK Denmark 2820 Gentofte
Tel: 31-681655
Danish Armed Forces Health Services
Køgevej 167
4000 ROSKILDE
Tel: +45 39771200

### 4.2 Civilian Organizations

4.2.1 Concept of Operations

All blood collections in Denmark are conducted by hospital blood centers. The centres are responsible for whole blood and cellular components. Plasma is provided to the State Serum Institute Fractionation Plant for Production of Various Products.

### 4.3 Civilian Blood Bank Procedures

4.3.1 Collections

About 5% of the blood is collected by mobile collection teams. All hospital blood centres operate donor collection rooms at the respective centre. Donor screening and examination include medical questionnaire, blood pressure, pulse, and haemoglobin. Age range is normally 18-66 years old. Blood is collected in plastic bags that contain Citrate-Phosphate-Dextrose-Adenine (CPDA-1), plus Saline-Adenine-Glucose (SAG)

by nurses under the supervision of a physician. Donors may donate four times a year, at prescribed intervals. The standard donation is 450ml. All donors are volunteers. Annual whole blood donations are approximately 400,000.

4.3.2 Processing

There is a mixture of automated and manual procedures, although most are automated. Tests for ABO blood groups, and Rhesus antigens and antibody HIV screens are performed; Radio immune (RIA) and enzyme procedures are performed for hepatitis. Blood donor testing reveals a positive hepatitis rate of approximately 0.3% among prospective donors. The routine test for syphilis is the VDRL. There are immunohematology reference laboratories available in most blood centers. VDRL may not be routine test for syphilis.

4.3.3 Components

| Blood Products | Maximum Expiration Period |
|---|---|
| Red Cells (CPDA-1) | 35 days. |
| Red Cells (CPDA-1-SAG) | 35 days. |
| Fresh Frozen Plasma | 24 months. |
| Platelets | 7 days. |
| Cryoprecipitate | 24 months. |

4.3.4 Storage

Blood products are stored in refrigerators, freezers or on rotators.

4.3.4.1 Blood Products Minimum Temperature Range

| | |
|---|---|
| Red Cells | 2 - 6°C. |
| Fresh Frozen Plasma | -30°C. |
| Platelets | 20 - 24°C. |
| Cryoprecipitate | - 30°C. |

4.3.5 Distribution

Blood is transported in polystyrene boxes to serviced hospitals. Frozen ice packs are used to cool blood. Transportation temperature range is generally -1°C - 10°C. Transportation mode includes blood bank vehicles and automobiles. Reservation against transportation temperature range.

4.3.6 Special Techniques

Several blood centers have limited frozen red cell operations. The high temperature/ low glycerol technique is routinely used. Apheresis and human lymphocyte antigen testing is performed in several blood centers.

4.3.7 Transfusion Practices

Standard cross match procedures are performed on blood. About 90% of transfusions are concentrated red cells. Reservation against percentage of transfusions that are concentrated red cells.

4.3.8 Points of Contact

Medical Director
Blood Bank
Rigshospitalet
Blegdamsvey 9
2100 Copenhagen O, Denmark
Tel: 31-396633 Ext 2031

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# CHAPTER 5 FRENCH BLOOD PROGRAMME (FRA)

## 5.1 GENERAL PRINCIPLES

The French transfusion policy is defined by the national security agency of drugs and health products (Agence Nationale de Sécurité du Médicament et des produits de santé: ANSM) which operates under the auspices of the French Ministry of Health. The latter organisation oversees the enforcement of this policy by the blood transfusion centers (BTC).
Both the civilian and military blood banks implement common rules and guidelines for donor selection, blood donation testing, production and quality control of blood products.
According to its method of preparation, therapeutic plasma has a status of blood product or drug but the therapeutic plasmas with an industrial status are not produced by the French blood banks.
All plasma collected for fractionation, by the French military or civilian blood banks, is sent to the "Laboratoire Français du Fractionnement et des Biotechnologies" (LFB), a non-profit public interest group. Then blood coagulation factors (fibrinogen, activated Factor VII activated…) falls within the scope of the blood-derived medicinal products regulation.

### 5.1.1 Blood collections

Blood is collected with mobile team in about 90% of all cases.
Blood donation is voluntary, anonymous and non-remunerated. European and national guidelines for donor selection are applied. The age of donors ranges from 18 to 70 years. The amount of blood collected is 8 ml/kg with a maximum of 500 ml.
Whole blood is collected in plastic bags with Citrate Phosphate (CPD) as anticoagulant. Then, blood is leucoreduced by filtration, divided in plasma, Buffy-coat and red cell concentrates.
Plasma, platelets and red cells can be collected by aphaeresis. In addition autologous blood donation programs are performed in BTC.

### 5.1.2 Production of blood components

Red cells are stored between 2°C and 6°C in SAG-M additive solution for 42 days.
Platelets obtained by pooling or aphaeresis are stored in constant agitation between 20°C-24°C temperature for 5 days. Some of these platelets are secured through a physico-chemical treatment for pathogen reduction (Amotosalen).
Therapeutic plasma is Fresh Frozen Plasma (FFP) obtained by aphaeresis or from whole blood and secured through a physico-chemical treatment for pathogen reduction (Amotosalen: FFP-IA) or by quarantine (FFP-se).
In the case of quarantine, serological tests from another blood donation are again checked after a minimum delay of 60 days.
All FFP are stored at a temperature less than or equal to [-25°C] for one year after the collection date.

All blood components dedicated to transfusion are leucoreduced with a maximum of 1000 000/bag for cell products and 10 000/l for plasma.
The French national system used for coding the labile blood products is the MONARCH system (and not the ISBT code 128).

### 5.1.3 Blood donation testing

The following tests are performed on all donations by automated procedures according to the national rules:

- ABO, Rhesus and Kell blood group.
- Red blood cell antibody screen.
- TPHA testing for syphilis.
- HIV 1 & 2 antibody screen by ELISA.
- Hepatitis surface antigen (HBs Ag) screen by ELISA.
- HBc antibody screen by ELISA.
- Hepatitis C antibody screen by ELISA.
- HTLV 1 & 2 antibody screen by ELISA.
- NAT (Nucleic acid test) for VIH1 and VHC and VHB

Any blood donation with positive serological test is destroyed.
All consecutive positive serological tests are confirmed by WESTERN BLOT for HIV, HTLV and Syphilis, and by RIBA (recombinant immunoblot assay) for HCV.
According to the medical history or epidemic context, other tests are carried out such as Elisa for Cytomegalovirus (CMV), malaria, Chagas disease and NAT for hepatitis E, West Nile, Zika.

### 5.1.4 Quality control of blood products

Characteristics of blood products are checked internally on a regular basis and also by the ANSM.

### 5.1.5 Distribution

Blood is transported in isotherm boxes to hospital units. Eutectic plates (passive cooling) are used to keep the temperature consistent with the regulations. Continuous recording controls the temperature during transport.
For RBC, a temperature range of transport between 2 and 10 ° C is allowed during 24:00.

### 5.1.6 Transfusion Practices

RBC, PFC and platelets delivered must be transfused within 6 hours after reception.
Outside the vital emergency, every patient is tested for irregular antibodies before RBC transfusions. When the result is positive, a cross-matched using antiglobulin is always carried out before transfusion.
A bedside-ABO testing is required before every RBC transfusion in accordance with national rules.

## 5.2 SPECIFICITIES OF THE MILITARY BLOOD CENTER

### 5.2.1 Military specificities

The French Military Blood Institute (Centre de Transfusion Sanguine des Armées: CTSA) is the only military blood supplier in France.
The CTSA operates independently and autonomously under the authority of the Ministry of Defense, and in accordance with the technical and safety French, European and NATO guidelines. The CTSA is in charge of collection, preparation and distribution of blood products to supply the armed Forces, especially during overseas operations (OPEX). It also supplies four military hospitals with high blood activity to maintain its high level of expertise.
The CTSA consists of two sites: Clamart near Paris (main site) and Toulon. In Clamart, all blood transfusion activities are carried out such as blood collection, blood processing, blood testing, quality control, distribution and immuno-haematology analysis for recipients. In the other site of Toulon all blood collection activities and the preparation of Fresh Frozen Plasma (FFP.IA) and platelets derived from aphaeresis are carried out.

### 5.2.2 Blood collections

Blood is collected from military and civilians donors in the CTSA and in French military facilities through mobile units.
The blood collection teams consist of military nurses and medical officers. A medical doctor is always present on the blood drive site and a responsible medical doctor is appointed for each mobile collection
Every year, about 22.000 whole blood units are collected. The CTSA also produces platelets and plasma derived from aphaeresis or from whole blood; in addition autologous blood donation programs are performed.
In overseas operations when an extreme emergency situation occurs, Role 1, 2 and 3 medical units can collect fresh whole blood from French voluntary donors screened in France or from members of allied forces, and then they should be preferably donors in their country.

### 5.2.3 Blood products

The CTSA is the only French institution allowed to produce French Lyophilized Plasma (FLYP).
The FLYP is drawn from a maximum of ten plasma donors, then secured by Amotosalen treatment and lyophilized to obtain 210 ml of therapeutic plasma after reconstitution. FLYP is stored at room temperature (2–25°C) for 2 years. It is reconstituted easily in less than six minutes, with water for injection also included in the distribution kit. It has a universal blood group compatibility. It is well tolerated and it has a high efficiency.
In case of massive bleeding requiring the addition of platelets or in case of coagulopathy or if insufficient RBC stock is available, collection and transfusion of fresh whole blood are allowed under the conditions of strict procedures of donor selection, biological controls and traceability.

In addition, the CTSA has a program for freezing RBC and Platelets.

5.2.4 Distribution

RBC, FFP and Platelets are provided to the military hospitals according to their needs. Overseas operations are supplied with RBC, FLYP and kits for collection and transfusion of fresh whole blood. These kits are conditioned and produced by the CTSA. The supply of platelets is performed with the fresh whole blood collected and transfused on the field
RBC shipped to overseas operations are packed specifically to be kept at a transport temperature between 2 ° C and 6 ° C for a maximum of six days (up to 10 ° C allowed during 24h). Eutectic plates (passive cooling) are used to keep the temperature consistent with the regulation. Continuous recording monitors the temperature during transport.

5.2.5 Specific transfusion Practices

**In French military hospitals**:
Nothing differentiates military and civilian transfusion practices that comply with national references.
FLYP is used in case of immediate and vital emergency, waiting for FFP to be thawed and ready to use.

**In Overseas operations**
The French army use FLYP as therapeutic plasma in overseas operations and during medical evacuations (MEDEVAC).
In role 1 highly isolated and exposed, FLYP and kits for blood collection and transfusion are available.
In roles 2 and 3, RBC and FLYP are available. Platelets input is given through fresh whole blood collected and transfused in the field.
Collection and transfusion of whole blood are allowed under the conditions of strict procedures for donor selection, biological controls and traceability.
In role 3, outside the vital emergency, a cross-matched using antiglobulin is carried out before RBC transfusion (but the patient cannot be tested for irregular antibodies).
In any case, a bedside-ABO testing is performed between RBC and the recipient.

5.2.6 Points of Contact

Centre de Transfusion Sanguine des Armées Jean Julliard
Rue du Lieutenant Raoul Batany
92140 CLAMART
France
Tél. : +33 1 41 46 72 01

## 5.3 CIVILIAN BLOOD SPECIFICITIES

5.3.1 Civilian organisation

The civilian authority for blood transfusion is the « Etablissement Français du Sang » (EFS) which is divided in 15 regional centers. It is under the authority of the health ministry.

5.3.2 Blood collections

Collections are mainly performed in civilian areas but when blood collection by CTSA is unavailable, blood collections in military units can be performed by civilian blood banks.

Every year around 2.500.000 blood units are collected by EFS. In addition, EFS collects platelets and plasmas through aphaeresis and perform an autologous blood donation program.

5.3.3 EFS has a program for freezing RBCs and platelets.

5.3.4 Specific transfusion practices

The FLYP can be distributed to civilian facilities through an agreement between the EFS and the CTSA.

5.3.5 Points of Contact

Établissement Français du Sang (EFS)
1, Avenue du stade de France
F-93 218 la Plaine saint Denis
France
Tél. : +33 1 55 93 95 00

Laboratoire Français de Fractionnement et des Biotechnologies (LFB)
3, Avenue des Tropiques - BP 305
F-91 958 LES ULIS Cedex
France
Tél. : +33 1 69 82 70 10

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# CHAPTER 6 GERMAN BLOOD PROGRAMME (DEU)

## MILITARY BLOOD PROGRAMME

## 6.1 Concept of Operations

### Organisation

6.1.1 Military

The blood bank at the “Zentrales Institut des Sanitaetsdienstes der Bundeswehr (Central Institute of the Bundeswehr Medical Services) Koblenz” collects blood from volunteer donors at military installations throughout the Federal Republic of Germany (troop barracks).
Red blood cell concentrates are provided to German field hospitals deployed to foreign countries. In addition, red blood cells are provided to medical facilities on naval vessels, to German military hospitals and civilian health care institutions.
Frozen plasma is either sold to a fractionating enterprise in order to produce other plasma-derived medicinal productsor manufactured to fresh frozen plasma and distributed within the Bundeswehr.

6.1.2 Civilian

An estimated 75% of civilian blood collections in Germany are conducted by the German and the Bavarian Red Cross blood centres. The centres are responsible for whole blood and cellular components. The other 25 % of civilian blood collections are performed by the national communal e.g. hospital blood donation services and commercial donation services (plasma in first line). The Paul-Ehrlich-Institute in Langen as the national regulatory authority in Germany is ultimately responsible for the quality of blood products including those manufactured by the Federal Armed Forces.

## 6.2 Collections

6.2.1 Military

Blood is mainly collected as whole blood by a mobile unit that regularly visits military installations. Members of the blood collection team are non-commissioned officers of the German Army. On mobile collections, the physician of the respective military unit is responsible for the examination of the donors, the head of production within the blood donation centre is responsible for the entire donation process. All donors are volunteers according to the German transfusion act. Furthermore, red blood cells are collected by apheresis on a small scale (approximately 500 units per year).

Blood is collected in plastic quadruple bags, which contain Citrate-Phosphate-Dextrose (CPD) as anticoagulant and Phosphate-Adenine-Guanosin-Glucose-Saline-Mannitol

(PAGGS-M) or Saline-Adenine-Glucose-Mannitol (SAG-M, apheresis) as additive solution for storage of leukodepleted red blood cells.

About 5% of the blood units are taken by means of hemapheresis in a stationary donation room resulting in two RBC units following one donation and utilizing ACD (Anticoagulant Citrate Dextrose) as stabiliser, and SAG-M (Saline-Adenine-Glucose-Mannitol Solution) as additive solution.

6.2.2 Civilian

Annual whole-blood donations are approximately 4,500,000 units.

## 6.3 Commonly available blood products

Military/Civilian

| | |
|---|---|
| Red Cell Blood Cells (SAG-M) | 36-42 days |
| Red Blood Cell (PAGGS-M) | 42-49 days |
| Fresh Frozen plasma | 12-24 months |
| Platelets | 4 days (beginning at midnight of the day of the collection) |
| Lyophilized Plasma | about 15 months |

## 6.4 Distribution

6.4.1 Military

Red blood cell concentrates are transported in polystyrene boxes or isolate containers with a capacity of 10-25 units in regional hospitals. The permissible temperature range for transportation of red blood cells in Germany is limited between +1°C - +10°C. For transport to field hospitals by aircraft, a specially isolated container with a capacity of up to 40 units is used that maintains the essential temperature for a minimum of 54 hours if environmental temperature does not exceed -10°C or +40°C. The temperature is permanently monitored using a temperature-logger, which can be read out after connection to a PC.

6.4.2 Civilian

Blood is transported in polystyrene boxes to hospitals. Frozen ice packs are rarely used to cool transported blood because transportation time by car and train is very short. Transportation range is generally +1°C - +10°C.

## 6.5 Storage military/civilian

Blood products are stored in refrigerators, freezers, refrigerator boxes on board or on rotators (platelets).
The blood products minimum temperature ranges are:
Red Cells +4°C +/- 2°C

| | |
|---|---|
| Fresh Frozen Plasma | ≤ -30°C and lower |
| Platelets | +22°C +/- 2°C under permanent gentle agitation |
| Lyophilized Plasma | +2°C - +25°C |

### 6.6 Transfusion practices Military/Civilian

Standard cross match procedures are performed on blood. Red blood cells, fresh frozen plasma and platelets are routinely used for transfusions. Physicians are required to perform an additional bedside cross match (identification-test of the recipient) before blood transfusions.

### 6.7 Military Blood Bank Procedures Testing

The following tests are performed
AB0, Rhesus and Kell blood groups
Antibody screen
Test for antibodies against syphilis (ELISA)
HBsAg
Anti-HBc
Anti-HIV 1 and 2
Anti-HCV
HIV-NAT
HCV-NAT
HBV-NAT
HAV-NAT
Parvovirus B 19 NAT

All blood products demonstrating any positive serological screening assay results are eliminated. All repeatedly positive serological test results are confirmed by means of additional laboratory examinations (for instance immunoblot, maximum-sensitive PCR, neutralization assay). Additional immunohematological antibody differentiation is performed.
The production process is permanently supervised by exemplarily investigation of residual cell count and other quality parameters. Reference aliquots of serum/plasma from every donation are stored over three years (≤ - 30°C) for examination in the context of look-back procedures.

### 6.8 Military points of contact

Bundeswehr Medical Service Headquarters
II 1.2
Von-Kuhl-Strasse 50
D-56070 Koblenz
Germany
Phone: 0049-261-896-22120

Central Institute of the Bundeswehr Medical Services Koblenz
Department V - Blood Donation Service

Andernacher Strasse 100
D-56070 Koblenz
Germany
Phone: 0049-261-896-77501 or 77504

# CHAPTER 7 GREEK BLOOD PROGRAMME (GRK)

## MILITARY BLOOD PROGRAMME

### 7.1 Concept of Operations

7.1.1 In the Greek Armed Forces, the Army operates as the single service for blood supply. Blood products are also received from civilian sources. Plasma from military collections are sent to the National Blood Transfusion Centre and Blood Derivatives Unit, Piraeus, for fractionation into products for the military.

### 7.2 Military/Civilian Liaison

7.2.1 Hospital blood centres collect the majority of blood in Greece. There are approximately 50 hospitals with this capability. The Greek blood facilities are divided into Centres (6), Stations (45) and Units (135). Regional Centres are in Athens (4), Pireaus (1) and Salonica (1). There is also one Red Cross Centre located in Athens. Approximately 60% of the blood is collected by mobile collection teams.

### 7.3 Collection

7.3.1 All military blood is collected in hospital blood centres. The blood collecting team members are mixed, civilian and military. and each team includes a medical officer. The responsibility for donorship rests with the medical officer of the collection team. Donor screening and examination includes a medical questionnaire, pulse, blood pressure and haemoglobin. The blood is collected in plastic bags, which contain Citrate Phosphate Dextrose - Adenine (CPDA-1) solution. The standard donation is 450 ml. All donors are volunteers. Annual whole blood donations are approximately 250,000 units.

### 7.4 Testing

7.4.1 There is a mixture of manual and automated procedures, although most are automated. The following mandatory tests are performed on all donations:

7.4.1.1 ABO and Rhesus blood groups.

7.4.1.2 HIV l&2 antibody screen by ELISA.

7.4.1.3 Hepatitis surface antigen (HBsAg) screen by ELISA.

7.4.1.4 Hepatitis C antibody screen by ELISA.
7.4.1.5 Syphilis antibody screen by VDRL.

7.4.2 All repeated positive screening tests are sent to specialized National Public Health Laboratories for confirmatory tests.

## 7.5 Component Production

7.5.1 The following red cell components are produced and are stored at 2oC-6oC with a shelf life of 35 days:

7.5.1.1 Red Cell Concentrate with optimal additive (SAG-M).

7.5.1.2 Red Cell Concentrate with optimal additive (SAG-M) buffy coat depleted.

7.5.1.3 Red Cell Concentrate plasma reduced without optimal additive.

7.5.1.4 Whole blood CMV negative for neonates.

## 7.6 Plasma Products

7.6.1 Fresh Frozen Plasma stored at -30oC for 1 year.

7.6.2 Cryoprecipitate stored at -30oC for 1 year.

## 7.7 Platelet Concentrates

7.7.1 Single Whole Blood donation (recovered platelets) stored at 20oC-24oC for 3 days.

7.7.2 Apheresis Platelet Donations (4-6 single units) stored at 20o-24oC for 5 days.

## 7.8 Special Techniques

7.8.1 No special techniques are applied.

## 7.9 Storage Equipment for Operational Use

7.9.1 Blood products are stored in refrigerators and freezers.

## 7.10 Transportation/Distribution/Transshipment Equipment

7.10.1 Blood is transported in polystyrene boxes to serviced hospitals. Frozen ice packs are used to cool blood. Transportation mode includes blood bank vehicles, trains and aircraft.

## 7.11 Points of Contact

7.11.1 Operational

Ministry of Defence
Operational Support General Staff
Hellenic Army Support General Staff
Athens, Greece
Tel: 01-646-5201.

Hellenic Army General Staff
Medical Corps Directorate/2nd Office
Athens
Greece
Tel: 01-749-4919
Fax: 01- 778-6238.

7.11.2 Scientific/Transfusion Medicine/Research

401 Army General Hospital
Athens
Greece
Tel: 01-749-4740

7.11.3 Blood and Blood Product Supply

National Blood Transfusion Centre
and Blood Derivatives Unit
Nikea General Hospital
3 Pharmerloton Str
Nikes
Greece
Tel: 01-490-7777/491-4216
Hellenic Red Cross
Blood Research Laboratory
Thalassaemia Unit
1 Erithrou Unit
Athens
Greece
Tel: 01-691-0512/692-0001

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# CHAPTER 8 ICELAND BLOOD PROGRAMME (ICE)

## 8.1. MILITARY BLOOD PROGRAMME

There is no military blood programme.

## 8.2 Civilian Organizations

8.2.1 Concept of Operations

Blood collections in Iceland are conducted by the blood center, located at the Landspitalinn Hospital, Reykjavik. blood is collected, processed and distributed to all medical facilities on the island. The blood centre operates one mobile unit. Major hospitals supported are Landspitalinn (501 beds), Borgarspitalinn (499 beds), Ladakot (187 beds), Akureyri (120 beds), Akranes (96 beds), and Isafjordur and Keflavik (each 120 beds.

## 8.3 Civilian Blood Bank Procedures

8.3.1 Collections

8.3.1.1 Approximately 25% of the blood is collected by mobile collection teams. The Blood Centre also operates a donor collection room. Donor screening and examination include: medical questionnaire, blood pressure, pulse, weight, hemoglobin and temperature. Age range is normally 18-66 years old. Blood is collected by physicians or nurses under the supervision of a physician. Blood is collected in plastic bags that contain anticoagulant Citrate-Phosphate- Dextrose (CPD) and Citrate-Phosphate-Dextrose- Adenine (CPDA-1).

8.3.1.2 Donors may donate four times a year. The standard donation is 450ml. All donors are volunteers. Annual whole blood donations are approximately 15,000

8.3.2 Processing

There is a mixture of automated and manual procedures. Tests of ABO blood groups Rhesus antigens and antibody screens are performed. Enzyme procedures are performed for hepatitis. Post donation testing on donors indicate the positive hepatitis rate is approximately 0.1%. The test of choice for syphilis is the VDRL. There is an immunohematology reference laboratory available at the Blood Centre.

8.3.3 Components

The Blood Centre produces blood components.

| Blood Products | Maximum Expiration Period |
|---|---|
| Red Cells (CPDA) | 21 days. |
| Red Cells (CPDA-1) | 35 days. |
| Fresh Frozen Plasma | 12 months. |

| | |
|---|---|
| Platelets | 72 hours. |
| Cryoprecipitate | 12 months. |

8.3.4 Storage

Blood products are stored in refrigerators, freezers, or on rotators.

| Blood Products | Minimum Temperature Range |
|---|---|
| Red Cell | 2 - 6°C. |
| Fresh Frozen Plasma | -30°C. |
| Platelets | 20 - 24°C. |
| Cryoprecipitate | -30°C. |

8.3.5 Distribution

Blood is transported in polystyrene boxes to service hospitals. Frozen ice packs are used to cool blood. Transportation temperature range is generally 1-10°C. Transportation mode includes blood bank vehicles, trains and aircraft.

8.3.6 Special Techniques Nil.

8.3.7 Transfusion Practices

No information.

8.3.8 Points of Contact

Director
Blood Bank
Landspitalinn Hospital
PO Box 1408
Reykjavik, Iceland
Tel: 0354-1-29000

# CHAPTER 9 ITALIAN BLOOD PROGRAMME (ITA)

## MILITARY BLOOD PROGRAMME

### 9.1 Concept of Operations

#### 9.1.1 Organization

The ITA Armed Forces Blood System plays an autonomous role in the National Blood Plan, and its main task is to make the Armed Forces self-sufficient as far as blood and blood products are concerned. Military blood banks operate in the frame and discipline of the National Health Service and under the guidelines and regulations given by the National Blood Authority. Direction, co-ordination and control of the Military Transfusion Service are provided by the General Directorate of Military Medical Services. The four military blood centres collect blood from military donors both in their own facilities and in the barracks by their mobile units.

#### 9.1.2 Products

Red cell concentrates are stocked and delivered to Italian military hospitals or troops in operation according to their needs. Plasma is fractionated by industry. The Military Blood Centres also work together with the civilian structures in order to warrant blood supply during public emergencies.

### 9.2 Military/Civilian Liaison

The civilian hospital blood centres (nearly 300) collect the majority of blood in Italy. Volunteer organizations also operate. Self-sufficiency and co-ordination are organised on a regional and national basis. The Minister of National Health is the National Blood Authority and has ultimate responsibility for the quality of blood, he is assisted by Istituto Superiore di Sanità and by National Committee for Transfusional Services.

### 9.3 Collection

All donors are volunteers and National guidelines for selection of donors are used. Donor screening includes medical questionnaire, physical examination and Hb blood level. Age range is normally between 18 and 65. Annual whole blood donations are approximately 2,120,000. Blood is collected in plastic bags CE labelled with CPD (Citrate-Phosphate-Dextrose) as anticoagulant. Saline-adenine-glucose-mannitol is used as an additive solution for red cell concentrates. Donors may donate four times a year (female donors only two). The standard donation is 450 ml ±10%. The 98% of blood is separated into plasma, buffy coat and red cell concentrates.
Some blood centers have frozen red cells operations. The low temperature/high glycerol technique is used. Apheresis procedure is also performed.

## 9.4 Testing

The following tests are performed:

ABO, Rhesus and Kell blood groups
Hb and complete blood cell count
Irregular erythrocyte antibodies
ALT assay
HIV 1/2 antibody screen
Hepatitis B surface antigen (HBsAg) screen
Hepatitis C antibody screen
HCV-NAT
VDRL or TPHA test for syphilis

## 9.5 Components

| Blood Products | Maximum Expiration Period |
|---|---|
| Red Cells | 42 days. |
| Platelets | 5 days. |
| Fresh Frozen Plasma | 12 months. |

## 9.6 Storage

Blood products are stored in refrigerators or freezers. Platelets are stored in rotators at room temperature.

| Blood products | Minimum Temperature Range |
|---|---|
| Red cells | 2°C - 6°C. |
| Platelets | 20°C- 24°C. |
| Fresh Frozen Plasma | -30°C. |

## 9.7 Transportation/Distribution/Transshipment Equipment

Special cars equipped with refrigerated spaces both at 2°C-6°C and at -30°C are available to transport the units of blood and blood components where they are needed. When using other means of transportation (common cars, ambulances, trucks, helicopters, airplanes) the original preserving temperature of mobilized units is maintained by keeping them in hermetic thermo-boxes (polystyrol) with additional proper refrigerating elements inside.

## 9.8 Special Technique

Frozen red blood cells are produced according to the high glycerol NBRL method. Apheresis procedures are available in most centers.

## 9.9 Transfusion Practices

Red cells concentrates, plasma solutions and intravenous fluids are routinely used for transfusion. A standard cross match is performed on blood samples.

## 9.10 Points of Contact

9.10.1 Military

MINISTERO DELLA DIFESA
DIREZIONE-GENERALE DELLA SANITA' MILITARE
UFFICIO DI DIREZIONE E COORDINAMENTO DEL SERVIZIO TRASFUSIONALE MILITARE
Via Santo Stefano Rotondo n. 4
00183 - Roma
Tel. +39.06.777039212-777030213
Fax +39.06.7003718

9.10.2 Civilian

MINISTERO DELLA SANITA'
Lungotevere Ripa 1
00100 - Roma
Tel. +39.06.59941
ISTITUTO SUPERIORE DI SANITA'
Viale Regina Elena 299
00161 - Roma
Tel. +39.06.49901
Fax +39.06.49387202

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# CHAPTER 10 LUXEMBOURG BLOOD PROGRAMME (LUX)

## 10.1 MILITARY BLOOD PROGRAMME

There is no military blood programme.

## 10.2 Civilian Organisations

10.2.1 Concept of Operations

Blood collections in Luxembourg are delegated to the Red Cross. There is one blood centre located in Luxembourg City that provides blood to all the hospitals.

## 10.3 Civilian Blood Bank Procedures

10.3.1 Collections

A large quantity of the blood donations are collected by mobile collection teams. The blood centre also operates a donor room. Donor screening and examination include medical questionnaire, blood pressure and haemoglobin. Blood is collected in plastic bags that contain anticoagulant Citrate-Phosphate-Dextrose Adenine solution (CPDA-1). The standard donation is 450ml. All donors are volunteers. Annual whole blood donations are approximately 24,000 units.

10.3.2 Processing

10.3.2.1 Most procedures are manual. Tests for A, B, and O blood groups Rhesus antigens are performed.

10.3.2.2 Post donation testing for hepatitis B is carried out using ELISA and indicates the positive hepatitis rate is approximately 0.2%. The VDRL test is performed for syphilis. HIV tests are also performed. There is an immunohematology reference laboratory available.

10.3.3 Storage

Blood products are stored in refrigerators, freezers or on rotators.

10.3.4 Distribution

Blood is transported in polystyrene boxes to serviced hospitals. Transportation mode includes blood bank vehicles and taxis.

10.3.5 Special Techniques

Nil.

10.3.6 Transfusion Practices

Standard cross match procedures are performed on blood. About 55% of the transfusions are concentrated red cells. NATO/PfP UNCLASSIFIED A - 32 NATO/PfP UNCLASSIFIED

10.3.7 Points of Contact

Armée Luxembourgeoise
Service Médical
Caserne du Herrenberg
B.P. 166
L-9202 DIEKIRCH
Grand-Duché de Luxembourg

Tel: **352 - 80 88 44 Ext: 300 or 306
Fax: **352 - 80 88 44 Ext: 309

Croix-Rouge Luxembourgeoise
Centre de Transfusion Sanguine
B.P. 404
L-2014 Luxembourg
Grand-Duché de Luxembourg

Tel: **352 - 45 02 02 - 1
Fax: **352 - 45 72 69

Ministère de la Santé
57, Blvd de la Petrusse
L-2320 Luxembourg
Grand-Duché de Luxembourg
Tel: **352 - 478 - 55 51

# CHAPTER 11 DUTCH BLOOD PROGRAMME (NLD)

## MILITARY BLOOD PROGRAMME

### 11.1 Concept of operations

11.1.1 Military

Within the Ministry of Defence the Military Blood Bank (MBB) operates in single-service management for all of the NL Armed Forces from its only location in Leiden. Blood products (liquid red cells, FFP and platelets) are procured from a civilian blood bank, Sanquin Blood Bank.
The MBB provides these products to NL military units abroad, either directly (liquid red cells), or after processing to frozen products (red cells and platelets) or freezing to a lower temperature of –80°C (FFP). Military patients within the Netherlands receive blood products from civilian blood banks. The MBB also holds a stockpile of frozen red cells, FFP and frozen platelets.

11.1.2 Civilian

The NL civilian blood transfusion organization consists of one integrated blood supply service that controls the provision of blood and the regulation: the Sanquin Blood Supply Foundation. This foundation has 4 regional blood bank divisions to provide the local hospitals with blood products with a short shelf life, as well as plasma derivatives to all the hospitals. The MBB operates in close co-operation with Sanquin Blood Bank Division Amsterdam, with regard to procurement of blood components and scientific research.

### 11.2 Collections

Annually the Sanquin Blood Supply Foundation collects around 420.000 whole blood units, 300.000 plasmapheresis units, 43.000 units of buffy-coat platelets and 5.000 plateletpheresis units. Whole blood (500 ml) is collected in 73 ml of CPD. After processing, leukodepleted red cells are stored in SAGM.

### 11.3 Components, expiration period and storage

11.3.1 Military

Blood Products Maximum Expiration Period

| | |
|---|---|
| Leukodepleted Red Cell Concentrate (SAGM) | : 35 days |
| Frozen Red Cells | : 30 years |
| Fresh Frozen Plasma (-80°C) | : 7 years |
| Frozen Platelets | : 4 years |

Blood Products Minimum Temperature Range

| | |
|---|---|
| Leukodepleted Red Cell Concentrate (SAGM) | : 1°C - 6°C |
| Frozen Red Cells | : -80°C |
| Fresh Frozen Plasma (-80°C) | : -80°C |
| Frozen Platelets | : -80°C |

11.3.2 Civilian

Blood Products Maximum Expiration Period

| | |
|---|---|
| Leukodepleted Red Cell Concentrate (SAGM) | : 35 days |
| Fresh Frozen Plasma | : 12 months |
| Buffy-coat Platelets | : 7 days |
| Apheresis platelets | : 7 days |

Blood Products Minimum Temperature Range

| | |
|---|---|
| Leukodepleted Red Cell Concentrate (SAGM) | : 1°C - 6°C |
| Fresh Frozen Plasma | : -30°C |
| Buffy-coat Platelets | : 20°C - 24°C |
| Apheresis platelets | : 20°C - 24°C |

## 11.4 Licensure (Accreditation) / Guidelines

The Sanquin Blood Supply Foundation is responsible for the quality of the blood supply in the Netherlands. The Foundation issues its own guidelines, for the most part based on the European Guidelines, issued by the Council of Europe and EU Directives. In principle the MBB is also subjected to those guidelines, but also follows the AABB standards because of a different range of products, unknown in the civilian blood bank. The final goal is to have all civilian blood banks ISO 9001:2000 certified. The MBB is already ISO 9001:2000 certified since 2004***.***

## 11.5 Paid Donors / Volunteer donors

The Netherlands donor population consists 100% of voluntary non-remunerated blood donors.

## 11.6 Testing

The following tests are performed by Sanquin Blood Supply Foundation:

| | |
|---|---|
| ABO and Rh D | |
| Antibody screen | |
| TPHA for syphilis | (ELISA) |
| HBsAg | (ELISA) |
| HIV 1 and 2-NAT | |
| Anti-HIV 1 and 2 | (ELISA) |
| Anti-HTLV I and II | (ELISA) |
| HCV-NAT | |
| Anti-HCV | (ELISA) |
| Anti-HEV | (ELISA) |

All repeated reactive screening tests are sent to the National Institute of Transfusion Hematology for confirmatory tests. The quality control is performed in all transfusion centers.
Standard crossmatch procedures are performed on blood prior to transfusion at the blood bank of each hospital. The crossmatch for the problem-cases is solved at the transfusion centers. Cross match procedure (Diamed gel) is performed.

## 11.7 Shipping and monitoring

Liquid red cells are shipped in insulated transportation chests with a connection cable to the battery of a car, truck or plane. The frozen components (frozen red cells, FFP and frozen platelets) are shipped on dry ice in the same containers. A TempTale™ device continuously monitors the inside temperatures. Upon arrival this device is connected to a PC, which makes it possible to produce a graphic readout of the measured temperatures during transport**.**

## 11.8 Hemovigilance / Look - back

Hemovigilance is achieved based on a protocol signed between the blood transfusion service and the hospital, at local level. The hospital reports the transfusion reaction to the transfusion service center. The blood bag is returned to the transfusion service together with a special form for transfusion reactions and blood samples taken after transfusion**.**
At a national level a forum called TRIP (Transfusion Reactions In Patients) keeps track of all incidents reported. Via the software system Progesa the units issued by the civilian blood banks to the hospitals can be linked to individual patients and vice versa. ISBT code 128 is implemented.

## 11.9 POINTS OF CONTACT

11.9.1 Military

Medical Director Military Blood Bank
Plesmanlaan 1c
2333 BZ Leiden
The Netherlands
Tel: + 31-71-5685218
Fax : + 31-71-5685297
E-mail: m.zoodsma@mindef.nl

11.9.2 Civilian

Sanquin Blood Supply Foundation
Chairman of the Board
Plesmanlaan 125
1066 CX Amsterdam
Tel : + 31-20-5123000
Fax : + 31-20-5123303

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# CHAPTER 12 NORWEGIAN BLOOD PROGRAMME (NOR)

## 12 MILITARY BLOOD PROGRAMME

### 12.1 Concept of Operations

12.1.1 The Norwegian Armed Forces operates a military blood service. This includes ordering of blood and blood components from civilian hospital blood banks, blood logistics and the administration of blood and blood components at military treatment facilities.

12.1.2 Blood will normally be supplied from civilian hospitals, but field hospitals are equipped to collect blood from donors locally. Also, within the Special Forces and on some naval vessels, systems for walking blood bank/buddy transfusions are established.

### 12.2 Military/Civilian Liaison

12.2.1 To ensure effective cooperation between military and civilian organizations/units, the program specifies close links at the national, regional and districts levels while maintaining the military chain of command in authority.

12.2.2 The Norwegian blood supply is the responsibility of blood banks established as integrated departments of each hospital. The functions of the blood banks are supervised by an advisory board under the National Department of Health.

12.2.3 Machine readable barcode labels according to international standards are used for all units of blood, platelets, plasma and plasma fractions.

### 12.3 Collection

12.3.1 Blood is only collected from regular donors at the hospital blood banks. The blood bank head physician is responsible for all aspects of the blood bank routine, including health control of donors. All donors are volunteers, and national guidelines for selection of donors are used. The health controls include a medical questionnaire, hemoglobin and additional examinations when indicated. The standard blood donation is 450 ml.

Blood collected at military hospitals, at naval vessels and within the Special Forces are collected from pre-screened donors who are well informed of risks associated with blood donation and blood transfusion. The military responsible physician is responsible for the routines. Whenever possible the standards will comply with the civilian Norwegian routines. All deviations will be recorded and appropriate follow-up of both donors and recipients will be executed.

12.3.2 Blood is collected in plastic bags with Citrate Phosphate Dextrose (CPD)) as anticoagulant. In the civilian blood banks the whole blood is separated to produce red

cell concentrates, platelet concentrates and plasma, except for the small volume needed for whole blood transfusions (only applicable to some blood banks).In the military settings, component production is as of today not possible.

## 12.4 Testing

12.4. 1 The following tests are performed, mainly by automated procedures on all donations:

12.4.1.1 ABO and Rh(D) blood groups.

12.4.1.2 Blood group antibody screens.

12.4.1.3 HIV l&2 antigen and antibody screen

12.4.1.4 Hepatitis surface antigen (HBsAg)

12.4.1.5 Hepatitis C antigen and antibody.

12.4.1.6 Syphilis serology (first donation only, unless indicated)

12.4.1.7 HTLV 1/2 antibodies (first donation only, if indicated)

12.4.2 All repeated positive screening tests are confirmed by additional methods at University Hospital departments of microbiology.

## 12.5 Cellular blood components

12.5. 1 Whole blood for transfusion may be stored for up to 28 days at 4◦C, but usage within 14 days are recommended. Leukocyte depleted by filtration will always be performed in civilian hospitals and in military hospitals if possible. During field transfusion, leukocyte reduction procedures are not applicable.

12.5.2 Leucocyte filtered red cell concentrates. Prepared by filtration of SAG-M concentrates in production (i.e. within 4 h after donation). The number of leucocytes has been reduced sufficiently to avoid HLA immunization, febrile transfusion reactions and transmission of CMV. Maximal storage period: 35 days.

12.5.3 Filtered platelet concentrates. Due to the short storage time (7 days) of room temperature stored platelets, platelet concentrates are not routinely available when platelet transfusion is indicated for massive transfusion. Whole blood must therefore be used. Cold stored (4 C) platelets may be a feasible alternative.

## 12.6 Plasma Products

12.6.1 Pooled, fresh frozen plasma, Solvent/Detergent treated for viral inactivation (Octaplasma). Storage time: two years at -20C.

## 12.7 Storage Equipment for Operational Use

12.7.1 All the blood banks have refrigerators with temperature recorders and alarms. Minimum capacity equals the number of blood units normally used during ten days of peacetime activity.

## 12.8 Transportation/Distribution Equipment

12.8.1 Blood is transported in validated transportation boxes. The maximum storage time must be observed for each different box, dependent on the outside temperature conditions. For red cell concentrates, the temperature range should not exceed 1-10oC.

## 12.9 Points of Contact

12.9.1 Military

Norwegian Armed Forces Medical Services
N-2058 SESSVOLLMOEN

Tel: +47 03 003
Fax: +47 63 92 68 05

12.11.2 Civilian

MINISTRY OF HEALTH
Directorate of Social Security and Health
P.O.Box 7000 St.Olavs place
N-0130 Oslo, Norway

Tel: +47 24 16 30 00

Blood bank, Haukeland University Hospital,
PB 1400
5021 Bergen

Tel: +47 55 97 24 70

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# CHAPTER 13 POLISH BLOOD PROGRAMME (POL)

## 13.1 MILITARY BLOOD PROGRAMME

13.1.1 The Military Blood Service is a part of the national blood supply programme. The Minister of National Defense is the founding body of the service, and the factual supervision concerning the medical principles of blood service functioning is provided by the Scientific-Research Institute subordinated directly to the Minister of Health. The blood service in the Polish Armed Forces is represented by the Military Blood Donation and Blood Therapy Centre, which has seven regional blood donation centers. The region of responsibility of the Military Centre covers the whole Polish territory. The Centre has the accreditation of the Minister of Health for collection of blood and separation of its components. That means that the Military Blood Service has a quality control system, buildings and equipment that meet factual and sanitary requirements, as laid out in Polish regulations, employs staff with adequate qualifications and observes the medical rules of blood collection, separation of blood components and their distribution, established by the Scientific Research Institute, which factually supervises the whole public blood service.

13.1.2 The Chief of the Inspectorate of Military Medical Service (Surgeon General) directly supervises the Military Blood Service. The National Consultant in Clinical Transfusiology for Defence Matters supervises the process of ensuring high quality of blood products and blood substitutes as well as supervises the supply in blood and its components during peace and war. He is also the liaison with the National Consultant in Clinical Transfusiology in crisis and emergency situations.

13.1.3 The Military Blood Service supplies the Military Medical Service units of the Polish Armed Forces and of allied armed forces, within the confines of the host nation support (HNS) procedures. When necessary, it provides blood and its components for civilian hospitals. Therefore, it is a definite distribution system of blood and its products, which combines all aspects of blood donors management, production and storage of blood products with the safety of their therapeutic use. The Military Blood Service collects blood from both civilian and military donors. Fifty percent of blood is collected by mobile teams in military units.

## 13.2 Communication between military and civilian blood service units.

13.2.1 The civilian public service units include 21 Regional Blood Donation and Blood Therapy Centres. They have 135 blood donation facilities in all, the only activity of which is blood collection from donors. Blood is collected both on-site and by mobile teams. The Minister of Health is the founding organ of civilian blood service units, and the National Consultant in Clinical Transfusiology provides factual supervision, in co-operation with the Scientific-Research Institute.

13.2.2 The Polish Red Cross collects blood mainly by its mobile teams employing the professional staff of the Blood Donation and Blood Therapy Centre. Its activities include also the promotion of volunteer blood donation.

13.2.3 The National Blood Donors Council is the organization representing the majority of volunteer blood donors, who account for 93% of all blood donors in Poland.

13.2.4 Blood donor qualification is based on medical examination including checking of the donor's questionnaire, short medical check-up and measurement of haemoglobin concentration. The donors are aged 18-65 years, and their body weight, blood pressure, heart rate, peripheral lymph node status and body temperature are determined on routine basis. Blood is taken into plastic containers with CPD preservative fluid. Enriching SAGM/ADSOL fluid is added to red blood cell concentrate. A part of blood is taken into containers with CPDA preservative fluid. The male donors can donate blood six times a year and female donors – four times a year. During one donation 450 ml ± 10% (1 unit) is taken. Each year in Poland about 950,000 units of whole blood are taken, including about 30,000 units taken by the Military Blood Service.

13.2.5 Apheresis procedures are performed, mainly to obtain plasma and thrombocyte concentrate.

## 13.3 Blood collection.

Over a half of blood (51%) is taken by mobile teams in military units. Blood is taken by nurses under doctor's supervision. The donor is qualified for blood donation on the basis of donor's questionnaire, short medical check-up and haemoglobin concentration. Blood is taken into plastic containers with CPD preservative fluid. After isolation and separation of plasma, resuspending SAGM fluid is added to red blood cell concentrate. During one donation 450 ml ± 10% is taken. All donors coming to the Military Blood Service are volunteers.

## 13.4 Tests

13.4.1 Obligatory tests performed for each blood unit taken

13.4.1.1 Determination of ABO group system and Rh factor.
13.4.1.2 Identification of irregular antibodies.
13.4.1.3 Determination of Rh phenotype and K antigen.
13.4.1.4 Tests for syphilis.
13.4.1.5 HBs antigen screen.
13.4.1.6 Anti-HIV-1/2 antibody screen.
13.4.1.7 Anti-HCV antibody screen.
13.4.1.8 ALAT concentration.
13.4.1.9 HBV DNA.
13.4.1.10 HCV RNA.
13.4.1.11 HIV1 RNA.

13.4.2 All positive results of the screening tests are to be confirmed by the Military Blood Service laboratory.

## 13.5 Blood morphotic components

13.5.1 The following blood morphotic components are produced from whole blood:

13.5.1.1 Red blood cell concentrate with SAGM; stored for 42 days at 1°C - 6°C.

13.5.1.2 Thrombocyte concentrate;
- obtained from whole blood (1 unit), stored for five days at 20°C 24°C.
- Apheretic thrombocyte concentrate (4-6 units); stored for five days at 20°C - 24°C.

13.5.2 Red blood cell concentrate and thrombocyte concentrate can be then filtered, washed, irradiated or divided.

## 13.6 Plasma preparations

13.6.1 Fresh frozen plasma can be stored
- at -18°C to -24°C for three months
- at -25°C to -30°C for 12 months
- at temperature below -30°C for 24 months

13.6.2 Cryoprecipitate; the expiry date of the preparation, from the day of blood donation, depends on the temperature of storage and is

| | | |
|---|---|---|
| - | at -18°C to -24°C | 03 months |
| - | at -25°C to -30°C | 12 months |
| - | at temperature below -30°C | 24 months |

## 13.7 Transport, distribution, transport equipment

13.7.1 Blood and plasma are transported in polystyrene boxes, in which temperature is maintained by air-tight closure.

13.7.2 Blood and plasma are transported in polystyrene boxes, in which temperature is maintained by electric batteries:

| | | |
|---|---|---|
| - | for red blood cell concentrate: | 1°C - 10°C |
| - | for plasma: | -25°C |

## 13.8 Special techniques

Not performed.

## 13.9 Transfusion practice

For clinical use the following are used: red blood cell concentrate, thrombocyte concentrate, fresh frozen plasma and cryoprecipitate. In the case of transfusion of red blood cell concentrate, the following are carried out on a routine basis: serological

compatibility test, screening for irregular antibodies and tests for ABO group antigens and Rh factor.

### 13.10 Addresses and contact phones:

13.10.1 Military institutions

Inspectorate of Military Medical Service
00-911 Warszawa
Al. Niepodległości 218
Phone: (+48) (22) 684 69 62
Fax: (+48) (22) 684 68 63

Military Blood Donation and Blood Therapy Centre
04-349 Warszawa
Ul. Szaserów 128
Phone: (+48) (22) 681 67 07
Fax: (+48) (22) 681 67 31

13.10.2 Civilian institutions

Institute of Haematology and Transfusiology
02-776 Warszawa
Ul. Indiry Gandhi 14
Phone: (+48) (22) 349 61 00; (+48) (22) 349 61 76
Fax: (+48) (22) 349 61 78

# CHAPTER 14 PORTUGUESE BLOOD PROGRAMME (PRT)

## MILITARY BLOOD PROGRAMME

### 14.1 Concept of Operations

14.1.1 In the Portuguese Armed Forces, the Army operates as the single service manager for blood. Portugal has one military blood centre located in Lisboa. This blood centre collects blood from voluntary military blood donors. Blood is provided to the three military hospitals in Lisboa. Other military hospitals receive blood and blood components from the Instituto Português de Sangue (official civilian source).

### 14.2 Military Blood Bank Procedures

14.2.1 Collections

All blood is collected by mobile teams, which regularly visit military units, or at the Blood Centre, located at the Hospital Militar Principal. The blood collecting team includes military and civilian staff. At this time there is only one medical specialist in haemotherapy, who is a civilian doctor. Donor screening and clinical examination include medical questionnaire, temperature, pulse, blood pressure, haemoglobin, and weight. Blood is always collected by nurses under the supervision of a medical officer. Blood is collected in plastic bags containing anti-coagulant and additive solution Citrate-Phosphate- Dextrose (CPD) solution and/or Sorbitol-Adenine-Guanine-Mannitol (SAG-M). The standard donation is 450ml. All donors are volunteers. Annual whole blood donations are approximately 2,500 units.

14.2.2 Processing

Techniques are both manual and automated. Tests for ABO blood group Rhesus antigens, antibody screens detection of HIV, Ag HBs, Ac Hbe, HTLV tests are performed. The test of choice for syphilis is ELISA. There is an immunohaemotology and virus reference laboratory available in the Blood Centre for full validation of all procedures.

14.2.3 Components

There is regular component preparation. Filtration pre-storage is the predominant technique for red cell and platelets units leukocyte depletion.

| Blood Products | Maximum Expiration Period |
|---|---|
| (RCC) Red Cells (SAG-M) | 42 days. |
| (FFP) Fresh Frozen Plasma | 12 months. |
| (PC) Platelets from Buffy-coats | 5 days. |

14.2.4 Storage

Storage conditions for blood components guarantee the preservation of their quality during the whole storage period, in appropriate conditions in refrigerators or freezers with temperature recording and alarm devices.

14.2.5 Distribution

Blood is transported in polystyrene boxes to serviced hospitals. Transportation temperature range is generally 1º - 10ºC. Transportation mode includes blood bank vehicles and automobiles.

14.2.6 Special Techniques

Nil.

## 14.3 Civilian Organizations

14.3.1 Concept of Operations

Blood collections in Portugal are divided among three organizations. The largest and most prominent are hospital blood centres. There are thirteen such blood centres located in Lisboa (7), Coimbra (2) and Porto (4). The Red Cross has a small blood centre in Lisboa. The government has established a national blood programme to co-ordinate the blood services. The Ministry of Health has ultimate responsibility for the quality of blood through the Portuguese Blood Institute.

14.3.2 Civilian Blood Bank Procedures

14.3.2.1 Collections

All blood is collected at the blood centres. Donor screening and examination include medical questionnaire, blood pressure, pulse, weight and haemoglobin. Age range is normally 18-65 years old. Blood is collected by physicians and by nurses under the supervision of a physician. Blood is collected in plastic bags and disposable bottles that contain Citrate-Phosphate- Dextrose (CPD) and/or Sorbitol-Adena-Guanina-Manitol (SAG-M). Donors may donate four times a year at prescribed intervals. The standard donation is 450ml. All donors are volunteers. Annual whole blood donations are approximately 130,000 units.

14.3.2.2 Processing

There are both automated and manual procedures. Most procedures are automated. Tests for ABO blood groups and Rhesus antigens and antibody screens are performed. HIV 1 & 2 and HTLV 1 & 2 are tested for using ELISA and Western Blot. Radioimmune (RIA) and enzyme (ELISA) assays are performed for Hepatitis B and C. Blood donor testing reveals a positive hepatitis rate of approximately 1.2% among prospective donors. Tests for syphilis include VDRL and ROR. There are immunohaematology reference laboratories available in most blood centres.

14.3.2.3 Components

Most blood centres produce components.

| Blood Products | Maximum Expiration Period |
|---|---|
| Red Cells (SAG-M) | 42 days. |
| Fresh Frozen Plasma | 12 months. |
| Platelets | 5 days. |
| Cryoprecipitate | 12 months. |

14.3.2.4 Storage

Blood products are stored in refrigerators or freezers.

| Blood Products | Minimum Temperature Range |
|---|---|
| Red Cells | 2 - 6C. |
| Fresh Frozen Plasma | -30C. |
| Platelets | 20- 24C. |
| Cryoprecipitate | -30C. |

14.3.2.5 Distribution

Blood is transported in polystyrene boxes to serviced hospitals. Frozen ice packs are used to cool blood. Transportation mode includes blood bank vehicles or automobiles.

14.3.2.6 Special Techniques

Apheresis and human lymphocyte antigen testing is performed in several blood centres.

14.3.2.7 Transfusion Practices

Standard cross match procedures are performed on blood. About 80% of transfusions are concentrated red cells.

14.3.3 Points of Contact

14.3.3.1 Military

Ministry of Defence
DGP
AV I1ha da Madeira
1499 Lisboa, Portugal

Tel: 351-1-3010001 Ext 4503

Serviço de Imunohemoyerapia
Hospital Militar Principal
Largo da Estrela
1200 Lisboa, Portugal

Tel: 351-1-3970181 Ext 3446/3457

14.3.3.3 Civilian

Instituto Português de Sangue
Rua Pinheiro Chagas, 69,50.
1000 Lisboa, Portugal
Tel: 351-1-1573767

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# CHAPTER 15 ROMANIAN BLOOD PROGRAMME (ROE)

## MILITARY BLOOD PROGRAMME

### 15.1 Concept of Operations

#### Organization

15.1.1 Military

The sole Military Blood Transfusion Center (MBTC) is located in Bucharest. It is subordinated, both logistically and financially, to the Medical Directorate of the Ministry of National Defense, but is methodologically coordinated by the National Institute of Transfusion Hematology (specialized body of the Ministry of Health). The Military Center provides blood to the military hospitals from Bucharest. It also runs two protocols of autotransfusion and therapeutic plasmapheresis.

Excellent relations exist between the military and similar civilian centers.

15.1.2 Civilian

A Commission for Blood Transfusion functions in the Ministry of Health, supervising the activity of the National Institute of Transfusion Hematology. The Institute guides and controls the blood transfusion network in Romania. There are 41 civilian District Transfusion Centers (8 of regional interest) that control transfusion activity in their area.

### 15.2 Collection

In the Military, all blood is collected at the Center from military and civilian donors.

Blood is collected in plastic bags, which contain Citrate- Phosphate- Dextrose-Adenine (CPDA-1) as anticoagulant or Citrate- Phosphate-Dextrose (CPD) as anticoagulant and Saline-Adenine-Glucose Mannitol (SAG-M) as additive solution.

The standard donation is 400ml. The number of regular donors is small. Annual whole blood donations are approximately 4,000 units, including ~100 cytapheresis procedures.

In the civilian network, most of the blood is collected at the District Centers and about 20 % by mobile collection teams. Blood is collected in plastic bag containing CPDA as anticoagulant or CPD as anticoagulant with SAG-M as additive solution.

The standard donation is 400 and 450 ml. Most of the donors are regular donors.

Annual whole blood donations are approximately 400,000 units, including ~ 700 plasma and cytapheresis procedures.

### 15.3 The array of components available and the expiration dates

The following blood products are obtained in Military Blood Transfusion Center:

- o Whole Blood (CPDA-1) : 35 days
- o Red Cell Concentrate (CPD + SAGM) : 42 days
- o Leukocyte filtered Red Cell Concentrate : 42 days
- o Fresh Frozen Plasma : 12 months
- o Buffy coat Platelets : 5 days

o Aphaeresis Platelets : 5 days

The following blood products are obtained in Civilian Centers:
o Whole blood (CPDA-1) : 35 days
o Red Cell Concentrate (CPD + SAGM) : 42 days
o Leukocyte filtered Red Cell Concentrate : 42 days
o Fresh Frozen Plasma : 12 months
o Aphaeresis Plasma : 12 months
o Buffy coat Platelets : 5 days
o Aphaeresis platelets : 5 days
o Cryoprecipitate : 12 months

### 15.4 Licensure (Accreditation ) / Guidelines

Transfusion activity in Romania is based on the Law No.4/10.01.1995 concerning the blood donation, therapeutic use of blood and transfusion organization in Romania, accompanied by a series of Norms, according to the requirements of Council of Europe Guidelines.
Blood transfusion centers function by the approval of the Ministry of Health.

### 15.5 Paid Donors / Volunteer donors

The Law No.4/10.01.1995 defines blood donation as a humanitarian, voluntary, no remunerated and anonymous action.
The donors receive a ticket for a meal, 2 days off (including donation's day) and reduction on the public transportation.

### 15.6 Testing

The following mandatory tests are performed on all donations:
o ABO and Rhesus (D) blood groups, manual and semi-automated procedures
o Antibody screen (according to a national algorithm)
o HIV 1 & 2 antibody and P24 antigen screen by ELISA
o Hepatitis B surface antigen (HBsAg) screen by ELISA
o Hepatitis C antibody screen by ELISA
o HTLV 1 & 2 antibody by ELISA
o Syphilis antibody screen by TPHA or ELISA
o ALT

All repeated reactive screening tests are sent to the National Institute of Transfusion Hematology for confirmatory tests. The quality control is performed in all transfusion centers.

### 15.7 Shipping and monitoring

The Military Blood Transfusion Center can ship blood components, except for platelets, using the portable refrigerators Mod.C50 (C.F de Ciro Fiochetti, Italy).
The device can be supplied from battery (12-24V) as well as from 220V electric power. The temperature can be set from +10 to -24°C and it appears on the display.

There is not any temperature monitoring system.

### 15.8 Hemovigilance / Look – back

Hemovigilance is achieved in base of a protocol signed between the blood transfusion center and the hospital, at local level.
At the level of each hospital there is a commission on transfusion, which includes representatives of both blood transfusion services and hospital. This commission plays the role of permanently assessing the transfusion practice, analyzing the untoward and unexpected effects of blood transfusion as well as taking the necessary preventive measures.
Achievements depend on how well the hospital departments are cooperating with blood centers.
The next step in order to improve this activity is to set up a national hemovigilance program to allow an operational connection between hospitals, blood transfusion services and national authorities.

### 15.9 Traceability.

The procedure of identifying donors, patients and laboratory allows restoring the entire chain. This activity is possible but difficult, because of the data are written down in the registers (written record). One of the main aims for the next 2 years is the implementation of the transfusion software in all blood transfusion centers. ISBT code 128 is not implemented.
Labeling of blood bags is made only manually. Labels are including the following information:
o name of producer
o identification number of donation
o name of the transfusion center
o type of blood in ABO and Rh D system
o expiry date
o storing temperature
o name, composition and volume of the anticoagulant.

## 15.10 Points of Contact

Dr. Florentina Vladareanu
General Director of National Institute of Transfusion Hematology
Bucharest 2-8 C-tin Caracas
Tel + 40 (21) 2128904
Fax + 40 (21) 2128911
E-mail : hemtransro@fx.ro

Dr. Carmen Macau
Military Blood Transfusion Center
Tel + 40 (21) 2126147
E-mail : macaucarmenil@yahoo.com

# CHAPTER 16 SPANISH BLOOD PROGRAMME (SPA)

## MILITARY BLOOD PROGRAMME

### 16.1 Concept of Operations

#### Organization

16.1.1 Military.

The Spanish Armed Forces Blood Transfusion Center (CTFAS) is located in Madrid. It is subordinated, both logistically and financially, to the Surgeon General Office, head of Services, but is methodologically coordinated by the Ministry of Health. The Center supplies blood to the Central Military Hospital “Gomez Ulla” in Madrid. It also runs two protocols in benefit of the Hospital: auto-transfusion and cytapheresis. The Center also supplies blood to the Spanish military medical treatment facilities deployed in international Operations

Excellent relations exist between the military and similar civilian centers.

16.1.2 Civilian.

There is, at least, a blood transfusion center in each Spanish Autonomous Community, plus the Spanish Red Cross, supervised by the Ministry of Health. There are 24 transfusion centers in Spain.

### 16.2 Collection

In the Military, all blood is collected at the Center from military and civilian donors. Apart of those from the center itself, the donations are made mainly in military units in Madrid and other areas, collected by mobile teams that visit them periodically.
Blood is collected in plastic bags, which contain Citrate-Phosphate-Dextrose (CPD) as anticoagulant and Saline-Adenine-Glucose Mannitol (SAG-M) as additive conservative solution.
The standard donation is 450ml. Annual whole blood donations are approximately 8,000 units, including approximately 100 cytapheresis procedures. Universal leucodepletion is performed in the center.

In the civilian network, most of the blood is collected in the different Autonomous Communities.

### 16.3 Commonly available blood products

| | |
|---|---|
| Packed Red Blood Cells conserved in SAG-Manitol | : 42 days |
| Fresh Frozen Plasma (FFP), Quarantined FFP and Inactivated FFP | : up to 36 months |
| Apheresis platelets | : 5 days/7 if inactivated |
| Random platelets | : 5 days/7 if inactivated |
| Frozen Red Blood Cells | : 30 years |

Frozen platelets : 12 months

## 16.4 Licensure (Accreditation ) / Guidelines

Transfusion activity in Spain is based on the Law No.1088/2005 and 1343/2007 concerning the blood donation, therapeutic use of blood and transfusion organization in Spain, accompanied by a series of Norms, according to the requirements of Council of Europe Guidelines.
Blood transfusion centers must be authorized by the Ministry of Health.

## 16.5 Paid Donors / Volunteer donors

Blood donation is considered a humanitarian, voluntary, non-remunerated and anonymous action. Routine screening includes a medical questionnaire, hemoglobin or hematocrit determination, weight, heart frequency, and blood pressure. All donors may self-exclude themselves and their blood products for transfusions purposes.

## 16.6 Testing

The following tests are performed on all donor units:

ABO and Rh D
Antibody panel: Irregular antibody screening and direct Coombs Test
Serum Test for syphilis
HBsAg (Chemiluminiscence)
Anti-HIV 1 and 2 (Chemiluminiscence)
Anti-HCV (Chemiluminiscence)
HIV 1/HCV /HBV (NAT)
HTLV-I, Chagas and Malaria in special donors.
ALT and AST
Hemogram

All repeat reactive screening tests are sent to reference laboratories for confirmatory tests. Standard crossmatch procedures are performed on blood prior to transfusion at the blood bank of each hospital.

**Quality**

In recent years, Spanish Armed Forces Blood Transfusion Center (CTFAS) has implemented a new quality management system and has achieved the certification according to ISO 9001:2008 Standards.

## 16.7 Shipping and monitoring

The Military Blood Transfusion Center can ship blood components, such as Packed Red Blood Cells, Fresh Frozen Plasma and frozen platelets, using the portable isothermic box Mod Electrolux RCB-25 with capacity for 25 units at less than 10°C. For frozen components: 10 units, 10 days at less than 18°C.

## 16.8 Hemovigilance / Look – back

Hemovigilance is achieved in base of a protocol signed between the blood transfusion center and the hospital, at local level.
Every hospital has a Transfusion Committee, which includes representatives of blood transfusion services, medical and surgical departments of the hospital. This committee plays the role of permanently assessing the transfusion practice, analyzing the untoward and unexpected effects of blood transfusion as well as taking the necessary preventive measures.
Achievements depend on how well the hospital departments are cooperating with blood centers.
A national hemovigilance Program allows an operational connection between hospitals, blood transfusion services and national authorities.

## 16.9 Traceability.

The procedure of identifying donors, patients and laboratory allows restoring the entire transfusional chain. We have implemented the procedures in the Transfusion Center and transfusion Services.

## 16.10 Points of Contact

Military

Centro de Transfusion de las Fuerzas Armadas
Hospital Central de la Defensa Gómez Ulla
Tel (34) 914228522
Fax: (34) 914228522

Civilian
Centro de Transfusiones de la CAM
Avenida de la Democracia s/n Madrid
28032 Madrid - SPAIN
Tel: - 913017202

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# CHAPTER 17 TURKISH BLOOD PROGRAMME (TUR)

## MILITARY BLOOD PROGRAMME

### 17.1 Concept of Operations

17.1.1 In the Turkish Forces, the military is the main source for blood donations. Additionally, all military centres receive donations from civilian blood donors. Military hospitals with 200 beds or more have blood collection capabilities for internal use. The largest is the Gülhane Military Medical Academy (GMMA) Blood Training Centre and Blood Bank in Ankara. This Centre has a blood component production capability for internal use. Plasma from military collections are fractionated into products by the Turkish Red Crescent Blood Centre in Ankara for the military.

### 17.2 Military Blood Bank Procedures

17.2.1 Collections

About 60% of the blood is collected by mobile units that regularly visit military installations. Routine blood donor screening includes a medical questionnaire, pulse, blood pressure, weight, hemoglobin and physician interview. Blood is collected by nurses under the supervision of a physician. Blood is collected in plastic bags with Citrate Phosphate Dextrose Adenine (CPDA-1) and Saline Adenine Glucose Mannitol (SAG-M). The standard donation is 450 ml. The GMMA Blood Training Centre and Blood Bank collects approximately 10,000 units per year. All donors are volunteers.

17.2.2 Processing

Techniques are mostly automated. Tests for ABO blood grouping, Rhesus antigens and antibody screens are performed on all donations. The following mandatory tests are performed on all donations:

Hepatitis B surface antigen screen.
HIV 1&2 antibody screen.
Hepatitis C antibody screen.
Syphilis testing.

### 17.3 Component Production

17.3.1 The following red

The following red cell components are produced and stored at 1°C - 6°C:

- Packed red blood cells with CPDA-1 with a shelf life of 35 days.
- Packed red blood cells with SAG-M with a shelf life of 42 days.
- These products may be further made into components, which have been filtered, irradiated, washed etc.

## 17.4 Plasma Products

17.4.1 Fresh frozen plasma:

- Fresh frozen plasma is stored at -18°C, or lower, for 1 year.
- Cryoprecipitate is stored at -18°C, or lower, for 1 year.

17.4.2 Platelet Concentrates

- Single whole blood donations are stored at 20°C - 24°C for 5 days.
- Apheresis platelet donations are stored at 20°C - 24°C for 5 days.

17.4.3 Special Techniques

Apheresis and human leucocyte antigen testing are performed in the GMMA Blood Training Centre and Blood Bank.

## 17.5 Storage

Blood products are stored in refrigerators and freezers.

## 17.6 Transportation and Distribution

Blood is transported in polystyrene boxes to service hospitals. The transportation temperature range in generally 1°C - 10°C.

## 17.7 Transfusion Practices

Standard cross match procedures are performed on blood. About 70% of transfusions are concentrated red cells.

## 17.8 Points of Contact

17.8.1 Military

Turkish General Staff HQ
Health Department
Ankara 06100
Turkey

Ministry of Defence
Health and Veterinary Department
Ankara
Turkey

Tel: 90-4-4023270

Gülhane Military Medical Academy
Institute of Field Medical Service
Ellik, Ankara
Turkey

Gülhane Military Medical Academy
Blood Training Centre and Blood Bank
Ellik, Ankara
Turkey

Tel: 90-312-3212059

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# CHAPTER 18 UNITED KINGDOM BLOOD PROGRAMME (GBR)

## 18.1 Concept of operations

18.1.1 The Surgeon General's Headquarters (HQSG) is responsible for blood transfusion policy and doctrine. A civilian Consultant Advisor in Transfusion Medicine is the named clinical advisor to the Surgeon General.

18.1.2 The supply of blood and blood components in support of UK Armed Forces is a function of Centre of Defence Pathology. Within that organization there is a smaller formation directly responsible for co-ordination and control, referred to as Blood Supply Team (BST). This specialist logistics team staffed by Biomedical Scientists is inspected by the Medicines and Healthcare Products Regulatory Agency (MHRA) and holds Blood Establishment status. The SO2 Responsible Person is the license holder on behalf of the Surgeon General. Blood is obtained directly from the National Health Service Blood and Transplant and is then distributed using both military and civilian logistics chain.

18.1.3 Blood components and professional services are obtained directly from National Health Service Blood and Transplant (NHSBT). BST maintains close professional links with NHSBT.

18.1.4 Blood components and lyophilised blood products may be sourced from other agencies and field programmes. Provision is to comply with the highest standards within operational constraints.

18.1.5 The main effort is to provide timely, sufficient, safe, supply of blood and blood services to military and entitled personnel.

## 18.2 Storage Equipment.

BST use the following equipment to store blood and blood components. All storage equipment is calibrated, maintained and temperature mapped in accordance with Blood Safety and Quality Regulations 2005 and the Guidelines for the Blood Transfusion Services in the United Kingdom.

18.2.1 Field Hospital Blood bank. Powered by mains or generator supply and able to store a maximum of 160 units of Red cell Concentrate (RCC) at a constant and measurable temperature range of 2 – 6 $^{o}$C.

18.2.2 Portable Blood bank. Powered by mains or generator supply and capable of storing a maximum of 50 units RCC at a constant and measurable temperature of 2 – 6$^{o}$C.

18.2.3 Fresh Frozen Plasma Freezer. Powered by mains or generator supply and capable of storing a maximum of 120 units FFP at a constant and measurable temperature of – 30 $^{o}$C.

18.2.4 Platelet Incubator/Agitator. Powered by mains or generator supply and capable of storing a maximum of 16 ATD at a constant and measurable temperature of 22 $^{o}$C.

## 18.3 Transport Containers.

18.3.1 Red Cell components. Worldwide routine and urgent shipments are by Golden Hour® shipping containers. Each container can hold a maximum of 30 units of RCC (SAGM) and shipment is at a constant 4±1 $^{o}$C. These containers have been validated to maintain a constant temperature of 4±1 $^{o}$C for 72 hours at a constant external temperature of 35 $^{o}$C.

18.3.2 Platelets (Liquid). Worldwide routine and urgent shipments are by Golden Hour® shipping containers. Each container can hold a maximum of 3 ATDs and shipment is at a constant 22±1 $^{o}$C. These containers have been validated to maintain a constant temperature of 4±1 $^{o}$C for 24 hours at a constant external temperature of 35 $^{o}$C.

18.3.3 Fresh Frozen Plasma/Cryoprecipitate. Worldwide routine and urgent shipments are by means of ACE 6 box. Each container can hold a maximum of 25 units of FFP at a constant temperature of -70 $^{o}$C and have been validated to maintain that temperature for 48 hours at a constant external temperature of 35 $^{o}$C.

## 18.4 Civilian Blood Transfusion Services.

18.4.1 Blood is provided by NHSBT. NHSBT collects blood and blood components from England. Approximately 1.6 million units of whole blood are collected annually.

18.4.2 All NHSBT centres are inspected by the Medicines and Healthcare Products Regulatory Agency (MHRA) and hold Blood Establishment status under the Blood Safety and Quality Regulations 2005. Blood, blood components, products and services must comply with the requirements of the current edition of the following standards:

- European Union Directive 2002/98/EC and 2004/33/EC
- Rules and guidance for Pharmaceutical Manufacturers 2007 incorporating the EC Guide to Good Manufacturing Practice (EC GMP)
- UK Acts of Parliament Blood Safety and Quality Regulations 2005. Statutory Instrument 2005/50 (ISBN 0110516222)
- Guidelines for the Blood Transfusion Services in the United Kingdom
- ISO 9000:2008
- Clinical Pathology Accreditation (CPA)
- Council of Europe. Guide to the preparation, use and quality assurance of blood components. Recommendation No R(95) 15, Strasburg: Council of Europe Publishing: 2008. ISBN: 978-92-871-6330-1.

18.4.3 There are 3 other UK Blood Transfusion Services: Scotland; Wales and Northern Ireland. All comply with the Guidelines for the Blood Transfusion Services in

the United Kingdom produced by the Joint UKBTS/HPA Professional Advisory Committee (JPAC).

18.4.5 Machine readable barcodes (ISBT 128 compliant) are used by all UK transfusion centres for blood and blood component issue and processing.

18.4.6 A standard whole blood donation of 450+/- 45 ml is collected into 63ml of Citrate Phosphate Dextrose (CPD) anticoagulant. During processing the majority of the plasma is removed and replaced by additive solution SAG-M. Red cells can also be collected by component donation. Specification: Hb > 40g/unit, WBC < 5 $x10^9$/unit.

18.4.7 Fresh Frozen Plasma (FFP). Plasma is obtained from whole blood donation predominantly from male donors to reduce the risk of TRALI. Specification: Factor VIIIc =>0.7IU/ml. FFP for patients born after 1 Jan 1996 is imported and treated with a viral inactivation method.

18.4.8 Cryoprecipitate. Cryoprecipitate is available as single units or pools of 5. Specification: Factor VIIIc >=70 IU/mL; Fibrinogen =>140mg/unit.

18.4.9 Platelets. Platelet components are produced from one of two processes to create an Adult Therapeutic Dose (ATD): A pool of buffy coat derived platelets from 4 whole blood donors suspended in a mixture of Platelet Additive Solution (PAS) and the plasma of one donor (male); or a therapeutic dose obtained from a single donor by component donation (apheresis). Specification: Platelet yield > 240 x $10^9$/unit.

18.4.10 All red cell preparations and other components are leukodepleted before issue.

18.4.11 Mandatory testing of all components is performed prior to release. This testing fully complies with the standards required in the Blood Safety and Quality regulations 2005 (and subsequent amendments), and the Guidelines for the Blood transfusion Services in the UK 2005 (and subsequent amendments). Testing in 2016 included:

117.11.1 ABO, Rh blood groups and Kell.
117.11.2 HIV1 & 2 antibody and antigen screen.
117.11.3 HBsAg screen.
117.11.4 Hepatitis C antibody screen
117.11.5 HTLV 1 & 2 antibody screen
117.11.6 HCV NAT
117.11.7 HIV NAT
117.11.8 HBV NAT
117.11.9 Other tests as required

18.12 All positive results are forwarded to specialist reference laboratory for confirmatory testing.

## 18.5 Shelf Life of Blood and Blood components.

18.5.1 Red Cell Concentrate (SAGM). The lifespan of a unit of RCC in optimal additive solution when stored at 4±1 $^{o}$C in an approved blood bank, portable blood bank is 35 days. The shelf-life may be extended to 42 days if required.

18.5.2 Fresh Frozen Plasma/Cryoprecipitate. The lifespan of a unit of FFP or cryoprecipitate when stored at -25 $^{o}$C in an approved FFP Freezer is 3 years.

18.5.3 Platelets (Fluid ATD). The lifespan of a unit of platelets when stored in an approved incubator/agitator at 22±1 $^{o}$C is 5 days. The shelf-life is extended to 7 days with bacterial testing.

## 18.6 Quality

18.6.1 The Blood Establishment status requires quality systems to ensure process control on all policies, processes and procedures. The SO2 Responsible Person (Blood) acts as the quality assurance for the military transfusion programme.

18.6.2 Proficiency testing. All established military field units are subject to national external quality assurance scheme participation to assure proficiency for each analyte tested by the facility. The operational training of military staff is the responsibility of the Defence School of Healthcare Education.

18.6.3 Quality control. Internal and external quality assurance schemes are operated by the Centre of Defence Pathology.

18.6.4 Clinical governance. Clinical governance is overseen by the Defence Medical Services Transfusion Committee which reports to the Defence Medical Services Clinical Committee.

## 18.7 Points of Contact:

Military Policy:
SO1 Clin Pol
Medical Directors Office
Joint Medical Command
ICT Centre, Vincent Drive, Edgbaston, Birmingham, B15 2SQ

Tel: +44 121 415 8867

Regulatory compliance
SO2 Responsible Person Blood
Centre of Defence Pathology
ICT Building
Institute of Research and Development
Birmingham Research Park

Vincent drive
Birmingham
B15 2SQ

Contact No: (Office) 0121 414 9062
(Duty) 07827 843678

OC Blood Supply
Centre of Defence Pathology
ICT Building
Institute of Research and Development,
Birmingham Research Park
Vincent Drive
Birmingham
B15 2SQ

Contact No: (Office) +44 (0)121 414 7911
(Duty) 07500 106250

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# CHAPTER 19 UNITED STATES BLOOD PROGRAMME (USA)

## MILITARY BLOOD PROGRAMME

### 19.1 Concept of operations

19.1.1 Military

The Assistant Secretary of Defence for Health Affairs (ASD[HA]) established the Armed Services Blood Program Office (ASBPO) to coordinate the worldwide blood programs of the Military Services and the Combatant Commands. ASBPO coordinates with other Federal agencies, other civilian blood agencies, and military blood agencies of other countries. In particular, the ASBPO and Service Blood Programs work closely with the US Army Medical Research and Materiel Command (MRMC), the Coagulation and Blood Research Program of the US Army Institute of Surgical Research, and the Joint Trauma System to meet the continuously evolving needs of military patients. The shared vision of this system is to ensure that quality blood products, blood substitutes or functional enhancers, and blood services are provided to improve patient care and reduce patient risk for all beneficiaries in peace, contingency and war. Each Combatant Command has a Joint Blood Program Officer (JBPO) to coordinate their respective command's blood program.

19.1.2 The Army, Navy and Air Force operate Service blood programs consisting of blood donor centres (BDC) and transfusion services (TS). Each Service has a Service Blood Program Office to oversee their respective programs. There are currently 20 licensed blood donor centres in the Continental United States (CONUS) and 4 donor centres outside the CONUS.

19.1.3 Joint blood doctrine has been established to provide a blood distribution system which incorporates all aspects of the blood program from the donor and the BDC to the medical treatment facility TS. Blood program policy is provided by the (ASD[HA]). The Armed Services Blood Program (ASBP) strives to be self-sufficient; however, the ASBPO maintains contingency contracts with US civilian blood agencies in case of need.

19.1.4 Civilian

US civilian blood agencies include:

The American Red Cross (ARC) provides approximately 45 percent of blood products for the United States.
The America's Blood Centres (ABC) is an organization which represents the majority of independent blood donor centres in the United States. Collectively, they provide another 45 percent of the blood products in the US.
The AABB (formerly known as the American Association of Blood Banks) is a national organization which has as its members: blood donor centres, blood transfusions

services, and individual **members.** Its main mission is to provide education and standardization within the blood industry through standards and technical procedures.

***The ASBPO maintains close professional relationships with these civilian agencies. Many of the AABB committees have DoD liaisons.***

## 19.2 Collections.

19.2.1 Annually, the ASBP collects around 125,000 whole blood units, 35,000 units of Fresh Frozen Plasma, and 8,000 plateletpheresis units. Most whole blood (~450 ml) is collected in 73 ml of CPD. After processing, packed red blood cells are stored in Additive Solution (AS-1, AS-3, or AS-5).

19.2.2 Available blood products

| | |
|---|---|
| • Packed Red Blood Cells (AS) | 42 days |
| • Low Titer Group O Whole Blood (CPD) | 21 days |
| • Fresh Frozen Plasma | 12 months |
| • 24 Hour Frozen Plasma | 12 months |
| • Liquid Plasma (CPD) | 26 days |
| • Cold Platelets (4°C apheresis, in plasma) | 72 hours |
| • Apheresis platelets (22°C, agitated) | 5 days |
| • Frozen Red Blood Cells | 10 years |
| • Cryoprecipitate | 12 months |

Also available: pathogen reduced apheresis platelets, cold stored platelets in platelet additive solution, whole blood (CPDA-1)

## 19.3 Designation, Authorization, Accreditation or Licensing of Blood Establishments

The BDCs of each Service are licensed by FDA and accredited by the American Association of Blood Banks (AABB) and College of American Pathologists (CAP). Each BDC and TS maintains FDA registration and participates in periodic agency inspections and accreditation audits.

## 19.4 Paid Donors / Volunteer donors

The ASBP donor population consists 100% of voluntary blood donors comprised of Active Duty, Reserve and National Guard troops, family members, retirees and DoD employees. Routine screening includes a medical questionnaire, hemoglobin or hematocrit determination, weight, temperature, and blood pressure. All donors may self-exclude their blood products for transfusion purposes.

## 19.5 Testing and Quality

The following tests are performed on all donor units:

- ABO and Rh D
- Antibody screen
- Serologic Testtest for Syphilis
- HBsAg (ELISA)
- Anti-HBc (ELISA)
- Anti-HIV-1 and 2 (ELISA)
- Anti-HTLV I and II (ELISA)
- Anti-HCV (ELISA)
- HIV-1/HCV (NAT)
- West Nile Virus (NAT)
- Chagas (T. Cruzi) (ELISA)
- ZIKV (NAT)

All repeat reactive screening tests are sent to reference laboratories for confirmatory tests.
Standard crossmatch procedures are performed on blood prior to transfusion at the blood bank of each hospital.

### 19.5.1 Quality

As part of the establishment licensure, registration and accreditation, all BDCs and TSs utilize Quality Systems to manage operational policies, processes and procedures. Management ensures process control on all these policies, processes and procedures, and that all personnel are trained in the Quality System applications. All TSs and BDCs are routinely audited and receive technical assist visits by the Service Blood Programs.

### 19.5.2 Proficiency Surveys/Testing Programmes

Each BDC and TS participates in a proficiency testing program, if available, for each analyte tested by the facility.

### 19.5.3 Quality Control

Each BDC and TS operates a quality control program to ensure that reagents, equipment and methods function as expected.

## 19.6 Shipping and monitoring

The ASBP routinely ships blood products in polystyrene insulated boxes known as Collins boxes. For packed red blood cells, 14 pounds of wet ice maintains up to 30 units at temperatures of 1–10C for 48 hours from time of packing. Frozen components (frozen red cells and FFP) are shipped on dry ice in the same containers at temperatures of -40C for 48 hours.

## 19.7 Hemovigilance / Traceability

The ASBP utilizes two procedures to monitor adverse events in donors and recipients and any epidemiological follow-up. The hospital reports the transfusion reaction to the transfusion service center. The blood bag is returned to the transfusion service together with a special form for transfusion reactions and blood samples taken after transfusion. Adverse events in transfusion recipients are also reported to the Patient Safety Data Center at the Armed Forces Institute of Pathology. The BDCs monitor blood donor reactions and also conduct lookback investigations on implicated products as specified through ASBP policy.

## 19.8 Points of Contact

19.8.1 Armed Services Blood Program Office
7700 Arlington Boulevard
Falls Church, VA 22042
United States
Tel: (703) 681-8024
Fax: (703) 681- 7541

19.8.2 Army Blood Program Office
Headquarters U.S. Army Medical Command
2748 Worth Road
JBSA Ft. Sam Houston, TX 78234-6000
Tel: (210) 808-2790/2792
Fax: (210) 808-2798

19.8.3 Navy Blood Program Office
Bureau of Medicine and Surgery
7700 Arlington Boulevard
Falls Church, VA 22042
Tel: (703) 681-5541
Fax: 703) 681-9612

19.8.4 Air Force Blood Program Office
AFMOA/SGBL
2261 Hughes Ave, Suite 153
Lackland, AFB, TX 78236
Tel: (210) 395-9928
Fax: (210) 395-1925

19.8.5 U.S. European Command
HQ EUCOM
Kurmacherstrasse Gebaude 2304
70569 Stuttgart
Germany
Tel: +49 (0)711-680-113

# ANNEX A OVERVIEW OF THE MILITARY BLOOD TRANSFUSION SERVICES IN NATO COUNTRIES

The table refers to the role of the military blood service within the country of origin : 1/role of military blood program, 2/ RBCs or PLTs frozen program, 3/ freeze-dried plasma production.

| Country | Military Blood Program | | | Frozen RBCs | | Frozen PLTs | | Freeze-dried plasma | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Civilian | Military | Civilian | Military | Civilian | Military | |
| | collection | processing | logistic only | Method | Method | Method | Method | | | |
| **Belgium** | Yes | Yes | x | High glycerol | High glycerol | No | No | No | No | Haemonetics ACP-215 |
| **Bulgaria** | Yes | Yes | x | No | No | No | No | No | No | |
| **Canada** | No | No | Yes | Yes | No | No | No | No | No | All blood products supplied by Canadian Blood Service |
| **Czech Republic** | Yes | Yes | x | No | High glycerol | No | No | No | No | Haemonetics ACP-215, military processing of frozen RBC components |
| **Denmark** | | | | | | | | | | |
| **Estonia** | | | | | | | | | | |
| **Finland** | | | | | | | | | | |
| **France** | Yes | Yes | x | Yes* | Yes* | Yes | No | No | Yes** | * Haemonetics ACP-215, processing of frozen RBC components, ** FDP - mixed, universal |
| **Germany** | Yes | Yes | x | High glycerol | No | No | No | Yes | No | FDP - group, from single donor |
| **Greece** | | | | | | | | | | |
| **Hungary** | | | | | | | | | | |
| **Iceland** | | | | | | | | | | |
| **Italy** | Yes | Yes | x | Yes | Yes | No | No | | | |
| **Latvia** | | | | | | | | | | |
| **Lithuania** | | | | | | | | | | |
| **Luxemburg** | | | | | | | | | | |
| **Netherlands** | No | No | Yes | High glycerol | High glycerol | No | DMSO | No | No | Haemonetics ACP-215, military processing of frozen RBC components |
| **Norway** | No | No | Yes | | | | | No | No | |
| **Poland** | Yes | Yes | x | High glycerol | High glycerol* | No | No | No | No | Missions are supplied by US forces *in Polish Army program of cryoconservation is not in routine use |
| **Portugal** | | | | | | | | | | |
| **Romania** | | | | | | | | | | |
| **Slovakia** | Yes | Yes | x | No | High glycerol | No | No | No | No | Haemonetics ACP-215 |
| **Slovenia** | Yes | Yes | x | | | | | | | |
| **Spain** | Yes | Yes | x | High glicerol | High glycerol | No | Yes | No | No | Haemonetics ACP-215 |
| **Turkey** | | | | | | | | | | |
| **United Kingdom** | No* | No | Yes | High glycerol | 0 | No | No | No | Yes | *Oversight of the operational Emergency Donor Panels |
| **United States** | Yes | Yes | x | High glycerol | High glycerol | No | No | No | No | Haemonetics ACP-215 |

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# ANNEX B SUMMARY OF NATIONAL BLOOD GROUP TESTING OF DONORS

Table identifies national rules for immunohematology testing of blood donors.

| Country | AB0-RhD+Ab screen | C | c | Cw | E | e | K | k | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 1 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | Extended phenotype with k for O Rh-negative donors |
| **Bulgaria** | 1 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | |
| **Canada** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Low titre O fresh whole blood donors tested for anti-A and B titres |
| **Czech Rep** | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | |
| **Denmark** | 1 | | | | | | | | |
| **Estonia** | 1 | | | | | | | | |
| **Finland** | 1 | | | | | | | | |
| **France** | 1 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | |
| **Germany** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1* | *k is tested in case K is detected |
| **Greece** | 1 | | | | | | | | |
| **Hungary** | 1 | | | | | | | | |
| **Iceland** | 1 | | | | | | | | |
| **Italy** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | |
| **Latvia** | 1 | | | | | | | | |
| **Lithuania** | 1 | | | | | | | | |
| **Luxemburg** | 1 | | | | | | | | |
| **Netherlands** | 1 | 3 | 3 | 0 | 3 | 3 | 3 | 3 | |
| **Norway** | 1 | 3 | 3 | 0 | 3 | 3 | 3 | 0 | |
| **Poland** | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | |
| **Portugal** | 1 | | | | | | | | |
| **Romania** | 1 | | | | | | | | |
| **Slovakia** | 1 | | | | | | | | |
| **Slovenia** | 1 | | | | | | | | |
| **Spain** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | Extended phenotype with Fya,Fyb,Jka,Jkb S,s for some O Rh-negative donors. |
| **Turkey** | 1 | | | | | | | | |
| **United Kingdom** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | Selective testing for k |
| **United States** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Legend: 0 - Not tested, 1 - Tested on every donation, 2 - Tested only on first and second time donors, 3 - tested only on the first

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# ANNEX C SUMMARY OF NATIONAL INFECTIOUS DISEASE MARKER TESTING

Table identifies national rules for routine testing of infectious disease markers in allogeneic blood donors.

| Country | ALT | Syphilis | HBsAg | Anti-HBc | Anti-HCV | Anti-HIV 1/2 | Ag p24 | Anti-HTLV I / II | NAT HBV | NAT HCV | NAT HIV-1 | NAT HTLV I/II | NAT HAV | WNV | NAT PV-B19 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | |
| **Bulgaria** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Canada** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | Test Anti-T.cruzi on every donation |
| **Czech Rep** | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0* | 0* | 0* | 0 | 0* | 0 | 0* | *NAT HBV,HCV,HIV 1, HAV and PV-B19 will be introduced in the military natinal blood centre in 2013 |
| **Denmark** | | | | | | | | | | | | | | | | |
| **Estonia** | | | | | | | | | | | | | | | | |
| **Finland** | | | | | | | | | | | | | | | | |
| **France** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1* | 1 | 1 | 0 | 0 | 0 | 0 | + Malaria & Chagas for donors at risk.<br>+ NAT VHE for 100% lyophilized plasma (military) and 30% civilian FFP since 2013 |
| **Germany** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | |
| **Greece** | | | | | | | | | | | | | | | | |
| **Hungary** | | | | | | | | | | | | | | | | |
| **Iceland** | | | | | | | | | | | | | | | | |
| **Italy** | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | |
| **Latvia** | | | | | | | | | | | | | | | | |
| **Lithuania** | | | | | | | | | | | | | | | | |
| **Luxemburg** | | | | | | | | | | | | | | | | |
| **Netherlands** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | NAT HIV 1/2 |
| **Norway** | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | NAT testing performed by plasma fractionation partner |
| **Poland** | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | NAT is perform in each unit of blood |
| **Portugal** | | | | | | | | | | | | | | | | |
| **Romania** | | | | | | | | | | | | | | | | |
| **Slovakia** | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Slovenia** | | | | | | | | | | | | | | | | |
| **Spain** | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | +Malaria & Chagas for donors at risk. |
| **Turkey** | | | | | | | | | | | | | | | | |
| **United Kingdom** | 0 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1* | 1* | 1* | 0 | 0 | 3 | 0 | *Initial triple NAT for HBV/HIV/HCV |
| **United States** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | Test Anti-T.cruzi on every donation |

Legend: 0 - Not tested, 1 - Tested on every donation, 2 - Tested only on first time donors, 3 – Selected donations

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# ANNEX D OPERATIONAL AVAILABILITY OF BLOOD COMPONENTS / PRODUCTS BY NATION

Table refers to available blood products , plasma derivatives and drugs for the management of bleeding in the field (in the mission).

| Country | WB (walking BB) | RBCs | | RBCs frozen | PLTs | PLTs treated | PLTs frozen | Plazma frozen | | | Plasma freeze-dried | | | PCC | Cryo | Fibrinogen | F VIIa | TXA | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC free | Leuko-depleted | | | | | Untreated | Treated | TRALI prevention | Untreated | Treated | TRALI prevention | | | | | | |
| **Belgium** | No | No | Yes | No | No | No | No | No | Yes | No | No | No | No | Yes | No | Yes | No | Yes | |
| **Bulgaria** | | | | | | | | | | | | | | | | | | | |
| **Canada** | No | No | Yes | No | No | No | No | No | Yes | No | No | No | No | No | Yes | Yes | No | No | *walking blood bang volunteers tested before departure |
| **Czech Rep** | Yes | No | Yes | Yes | No | No | No* | Yes | No | No* | No | No | No | Yes | No | Yes | Yes | Yes | *PLTs frozen will be introduced in 2013<br>*Plasma TRALI prevention will be introduced in 2013 |
| **Denmark** | | | | | | | | | | | | | | | | | | | |
| **Estonia** | | | | | | | | | | | | | | | | | | | |
| **Finland** | | | | | | | | | | | | | | | | | | | |
| **France** | Yes* | No | Yes | No | No* | No | No | No | No | No | No | Yes* | Yes | No | No | Yes | Yes | Yes | *walking blood bank volunteers tested before departure<br>*PLTs are imported for MEDEVAC from France<br>*FDP is universal for blood group and treated with Amotosalen |
| **Germany** | Yes | No | Yes | No | No | No | No | No | No | No | Yes | No | Yes | Yes | No | Yes | Yes | Yes | |
| **Greece** | | | | | | | | | | | | | | | | | | | |
| **Hungary** | | | | | | | | | | | | | | | | | | | |
| **Iceland** | | | | | | | | | | | | | | | | | | | |
| **Italy** | No | No | Yes | No | No | No | No | No | Yes | Yes | No | No | No | No | No | Yes | Yes | Yes | |
| **Latvia** | | | | | | | | | | | | | | | | | | | |
| **Lithuania** | | | | | | | | | | | | | | | | | | | |
| **Luxemburg** | | | | | | | | | | | | | | | | | | | |
| **Netherlands** | No | No | Yes | Yes | Yes | No | Yes | Yes | No | Yes | No | No | No | No | No | Yes | Yes | Yes | |
| **Norway** | Yes | No | Yes | No | No | No | No | No | Yes | Yes | No | No | No | No | No | No | Yes | Yes | |
| **Poland** | No | No | Yes | No | No | No | No | Yes | No | No | Yes | No | No | No | No | No | Yes | No | |
| **Portugal** | | | | | | | | | | | | | | | | | | | |
| **Romania** | | | | | | | | | | | | | | | | | | | |
| **Slovakia** | No | | | | No | No | No | Yes | No | | No | No | No | | | | | | |
| **Slovenia** | | | | | | | | | | | | | | | | | | | |
| **Spain** | No | No | Yes | No | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No | Yes | Yes | Yes | |
| **Turkey** | | | | | | | | | | | | | | | | | | | |
| **United Kingdom** | Yes | No | Yes | No | Yes* | No | No | Yes | Yes | Yes | Yes | No | Yes | No | Yes | No | Yes | Yes | WB = Pretested Emergency Donor Panel. *PLTs - both imported and walking blood bank |
| **United States** | Yes | No | Yes | Yes | Yes* | No | No | Yes | No | Yes | No | No | No | No | Yes | No | Yes | Yes | *PLTs - apheresis platelets collected in the field |

Treated = pathogen inactivated in order to further reduce the risk of infection, FDP = Freeze dried plasma, TXA = Tranexamic acid, PCC = Prothrombin complex concentrate

# SRD AMedP-1.1-1(A)(1)