How to reduce cost of apheresis plasma ?
First lessons of a benchmarking

EFS : the civilian blood transfusion organization in France

- 17 regional blood transfusion establishments (ETS) including 3 in overseas departments
- 9,800 employees
- 147 blood centers
- 40,000 mobile blood collection / year
- Turnover ≈ €860 million
- Investments ≈ €37,5 million
- €14.9 million of the budget allocated to research

- Nearly 1.7 million blood donors of which 360,000 first-time donors
- 3 million blood products donations
- Plasma ≈ 790,000 liters ; source plasma : 200,000 liters.

- 2,800 associations working to encourage blood donation

We must continously reduce the cost of the labil blood products while maintaining at a high level the quality of the products and the security.

Important reorganizations were decided :

- To increase the performance, we now have a single purchasing department ;
- We now have 4 screening centers to qualify the 10,000 LBP collected every days in France (we had 14 screening centers 5 years ago) ;
- We reorganized the realization and the storage of samples in biobanks ;
- We have decided to increase the performance of our blood centers :
  - 19 blood centers should close during this year ;
  - 36 blood centers are under supervision ➔ the performance increase (≈ 30% during the last year).
- The territorial organization is reviewed (we currently reduce the number of regional establishments : 14 ➔ 12 ➔…).

Our next important challenge : reducing the cost of source plasma (in compliance with ethical requirements).

-Market price << production cost (250€/L) ;
-Plasma collected in France represent ≈ half of needs.

Benchmark : the production cost > 250€/L for many EBA members.



Objectif 2.3

Étudier l'optimisation de la production de plasma par aphérèse et faire évoluer le cadre régissant les relations entre l'EFS et le Laboratoire français du fractionnement et des biotechnologies (LFB)

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9 EBA countries questioned, 8 questionnaires filled

- Austria, Red Cross*
- Belgium Flanders, Red Cross BS
- Denmark, South Danish Transfusion Service
- France, EFS
- Germany, GRC Baden-Württemberg – Hessen
- Italy, CNS
- Netherlands, Sanquin
- Spain, Spanish Blood Bank
- Sweden, Blood Center Örebro University Hospital



**Austria «The RC does not exercice plasmapheresis in Austria. This is done since the 1970ies by actors from the industry»*

This benchmarck was completed with this 3 visits :

- **Europlasma** : 2 plasma centers in Austria ;
- **Kedplasma** : 1 plasma center in Germany.

Sites organization

Thematic	EFS	EBA members	Plasma centers
Separate plasma sessions ?	No	No, excepted in 2 countries	Yes
Number of beds	5 à 10	< 15 Average : 6-10	30
Volume of apheresis plasma collected / blood center ?	Average ≈ 1,000 L (in 2014). > 8,000 L collected on 2 blood centers.	Average (6 countries) : 3 654 L/ blood center	Between 25 000 and 60 000 L.

EBA recommendations :

- Optimize the existing sites (if sustainable) ;
- Investigate (e.g. SWOT) opening of new centers dedicated to plasmapheresis donations.

To reduce the cost of source plasma, scheduling represents a major issue.

EBA recommendations :

- ✓ Give donors appointment for the next donation before/ after a donation : this should become best practice
- ✓ Educate donors to call when they have to cancel their appointment
- ✓ Use reminders (e.g. SMS) as appropriate
- ✓ **Optimise the scheduling of donations in such way to optimise the separators and staff involved**

Recruitment

EFS	EBA members	Plasma centers
Only from the existing WB donor pool	Only from the existing WB donor pool, excepted in 2 countries	Specific plasma

EBA recommendation :

- Reflect on direct recruitment of specific plasma donors (e.g. M vs F) ;
- Collaborate on recruitment messages and methods for VNRD

In France, associations should be a key actor for the recruitment of plasma donors

Loyalty and donation frequencies

Thematic	EFS	EBA members	Plasma centers
Loyalty	Refreshments, small tokens, reimbursement of costs linked to travel in some of regional Establishments	Refreshments, small tokens (3 countries) Compensation: -1 country : lump sum (15 €), -2 countries : time off work ; -2 countries : reimbursement of costs linked to travel	Compensation : lump sum…
Donation frequencies	2,5 / year	Average : 5,5 (5 countries) 1.77-**13.88** /year	16 - 32 / year

EBA recommendation :

- Assess the costs of the recognition means for donors as a basis for improving efficiency ;
- Reflect on a limit to distinguish compensation, as ethically acceptable, and remuneration, ethically unacceptable.

Plasma collection staff

Thème	EFS	Questionnaire EBA	Plasma centers
Health assessment	MD (or a nurse in few centers)	Donor attendant or MD	MD if : new donors, occasional donors and every 4 months In others cases, the questionnaire is verified by a donor attendant
Collection	Nurse	Nurse or Nurse + donor attendant	Nurse + donor attendant
Management of the center	M D	MD or nurse or donor attendant or « non medical manager »	MD or not, but with a **strong culture of management**
Organization's flexibility	Low	-	High

EBA recommendation :

-Whenever possible, consider the optimal qualification required (avoid over-qualification)

-Develop multi-skilled team (recommendation from EBA Benchmarking WG)

Management

Thematic	EFS	EBA members	Plasma centers
Monitoring of the activity	In place in only 3 blood centers (beds occupancy rate)	-.	Key indicators are monitored by the management.

EBA recommendation : Develop simple tool to assess the costs of PfF from apheresis: essential to help reducing the costs ➔ **Key indicators**

Screening

Tests réalisés	EFS	EBA members	Plasma centers
Détermination du groupe ABO	x	x	
Détermination du phénotype RH/K1	x	Pour la plupart. Certains ne le réalisent que pour les nouveaux donneurs de plasma	
Anticorps anti-erythrocytaires	x	Certains ne le réalisent que pour les nouveaux donneurs de plasma	
Détection des anticorps immuns anti-A et anti-B	x	Pas systématique	
Anticorps anti treponema pallidum			
Anticorps anti malaria			
Dépistages sérologique de virus HIV, HCV et HBV	^	^	^
Détection des anticorps de la maladie de Chagas	Si nécessaire	Si nécessaire	
Niveau de protéines	x	x	Selon différentes fréquences
Anticorps anti-Hbs et antitétanique	x	Dans certains cas spécifiques	
Détection du parvovirus B19 et hépatite A (fractionnement)	x	n'est pas réalisé partout	x
Anticorps anti-cytomegalovirus (CMV)	x	n'est pas réalisé partout	
Hémoglobine et hématocrite			x

The production of source plasma for fractionation shall be considered as a specific activity

EBA recommendation : **Review what screening tests could be removed or not systematically done**, according to EU (protein) and Eur. Pharmacopeia monography on PfF requirements (anti-HIV 1, anti-HIV 2, HBs Ag, anti-HCV)

We must consider the « <u>apparent cost</u> » of the plasma :

- RFID traceability increase the productivity ;
- **Ig concentration decrease when the donation frequency increase.**

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Specific protein content of pools of plasma for fractionation from different sources: impact of frequency of donations

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Vox Sanguinis

Background and Objectives Plasma pools for the production of human plasma medicinal products are distinguished according to the collection method (recovered or apheresis plasma) and the donor remuneration status. National regulations and the physical status of the donor determine the donation frequency and plasma volume per session. Relevant protein contents of different types of pools have not fully been compared.

Materials and Methods We compared the levels of total protein, 15 main relevant plasma protein markers, and *anti-B19* and anti-*Streptococcus pneumoniae* IgG in single-type pools of donations from different countries (Belgium, Finland, France, the Netherlands, Germany, United States). Both recovered plasma from non-remunerated donors and apheresis plasma from remunerated and non-remunerated donors were studied.

Results Pools from paid US high-frequency, high-volume plasmapheresis donors showed significantly lower total protein (−9%), albumin (−15%), total IgG (−24%), IgM (−28%), hemopexin (−11%) and retinol-binding protein (−10%) but higher C1-inhibitor, pre-albumin and C-reactive protein contents than pools from unpaid European Union (EU) or US whole-blood or plasmapheresis donors. In contrast to pools from compensated EU plasmapheresis donors, pools from unpaid whole-blood or plasmapheresis donors showed no significant differences, whatever the collection method or country. Reductions in specific protein contents correlated well with protein half-life.

Conclusion These results should be taken into account with regard to donor health management and protein recovery.

Key words: albumin, donor remuneration, immunoglobulin, plasma donors, plasma fractionation, proteins.

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Introduction

Human plasma-derived medicinal products are essential medicines for the treatment of patients with serious life-threatening chronic diseases and disorders [1]. Their production from plasma requires thoroughly appropriate donor selection, serological and microbiological donation screening, and pharmaceutical processing of plasma proteins. Plasma types can be classified according to the method of collection: recovered vs. apheresis (source) plasma, standard vs. hyperimmune plasma. Plasma types can also be distinguished according to the remuneration status of the donor (paid, compensated, or unpaid). Recovered plasma is produced by separating donated whole blood into cellular components and plasma. Source plasma is collected through apheresis, a process that takes only plasma from the donor while the cellular components are returned. Donation by plasmapheresis can be performed more frequently than whole-blood donation, as the body replaces the volume of donated plasma much faster than the volume of donated cellular components. Apheresis plasma can also be obtained as a by-product of

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Thank you.

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