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# APPROPRIATE TRANSFUSION POLICY; HOW TO LOWER TRANSFUSION RATESDUTCH EXPERIENCE AND PLANS (PROTON-STUDIES)

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**Abstract:**
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## INTRODUCTION

Blood products obtained from voluntary or paid donors are used in the treatment of various diseases. Although it is widely accepted that in some circumstances the use of red cell concentrates can be live saving or of good benefit for the patient, the evidence at this point is limited. Moreover, the optimal transfusion triggers for the different diseases are often unknown resulting in a great variety in transfusion practices. This was nicely shown in a survey published in 2007. In this survey epidemiological data was obtained from transfusion experts in the United States, England, Australia and Denmark. It was shown that there were major differences between the countries; the incident rate for red cell transfusions varied from 44.7 to 54.1 units, for platelets from 2.0 to 6.0 units and for plasma 4.8 to 13.8 units transfused per 1000 population per year. (1)
Also the most recent data obtained from the different West-European countries still shows a great difference in transfusion rates, i.e. ranging from 35 to 60 red cell concentrates per 1000 inhabitants per year. (personal communication Mart Janssen).
Although data about optimal transfusion triggers are limited, there is growing evidence that restrictive transfusion triggers are of more benefit for patients as compared to liberal triggers. (2, 3, 4)
This implies that the administration of blood products can harm patients in terms of morbidity and mortality and should result in lower transfusion rates. Also in periods of economic scarcity it would be helpful to use costly blood products in a proper way.
Therefore, it is important to lower transfusion rates to an optimal level.
What, however, is an optimal level of transfusion rates or transfusion triggers? To answer this question it is necessary to obtain (epidemiological) data of a nationwide representative sample of transfusion recipients. Some countries have developed databases or have elaborated software tools to collect these data such as SCANDAT and VOK in the Scandinavian countries and AIM in the United States. (5,6)
In the Netherlands, such data were obtained from 1996-2006 in the PROTON (Profiles of Transfusion Recipients) study.

## PROTON STUDY

In the PROTON study data on gender, age, survival and morbidity of recipients of 2.4 million transfusions were collected by linking data from hospitals, Statistics Netherlands (CBS) and Sanquin Blood Supply. The study was originally initiated to obtain insight in the cost-effectiveness of blood transfusion safety measures. However, analyses of the PROTON data uncover profiles of blood product transfusion recipients (7) and yielded detailed predictions on blood demand and supply in relation to demography (8). Moreover, subgroup analysis gives insight in the possible relationship of shelf-life of blood products and adverse reactions in recipients (case-control studies) (9).
More recent analyses have given some new insights in trends on blood use during the past years and will be presented at the symposium.

However, the PROTON dataset ended at the end of 2006 and no donor data were included in this database.
We, therefore, have started PROTON II, recently.

## PROTON II

In the PROTON II study the dataset will be enlarged. It is aimed to include 30 hospitals covering 80% of all transfusions in the Netherlands. Furthermore, detailed information on donor/donation characteristics and more detailed information on recipient characteristics will be collected using existing database.

The objective of the PROTON II project is, therefore, to link and analyse - in a nationally representative manner - quantitative data from existing databases of participating institutions in the Dutch blood transfusion chain. This in order to provide systematic and detailed analysis and ongoing advice on optimization of the efficiency, sufficiency and safety of blood transfusion in the Netherlands.

The constructed data repository allows:
(Inter)national benchmarking of hospitals on blood use characteristics (e.g. blood use per patient subgroup, outdating, shelf life, transfusion triggers). This can support managerial and/or logistic optimization and the development of guidelines on optimal blood use.
Trend analysis on clinical blood use among different patient subgroups and age distributions as well as changing indications and transfusion triggers which can be used to estimate future blood demand (optimal blood supply).
Quantitative analyses of (adverse) clinical outcomes and transfusion recipient survival in relation to various determinants in donor, product and/or production and recipient characteristics (optimal blood safety).
Not only cost-effectiveness analyses of safety interventions in the transfusion chain, but also of the health gains projected by the availability of blood transfusions e.g. the cost-effectiveness of blood.

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## HOW TO LOWER TRANSFUSION RATES?

At this moment there is growing evidence that restrictive red cell transfusion triggers are as good as liberal triggers and probably better. Therefore, it could be expected that this knowledge should be implemented in clinical practices. However, when transfusion rates are observed in the different European countries it still shows a wide range of transfusion rates per inhabitants. Moreover, there is a very different pattern of trends in blood use over the past years. To explain these differences is not so easy. It would be very helpful to have more insight in the characteristics of the transfusion recipients. Therefore, we hope that PROTON II will help us to understand in more detail and to improve transfusion practices in the Netherlands

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