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## Donor Categories : Heart-beating, Non-heart-beating and Living Donors ; Evolution within the last 10 Years in UZ Leuven and Collaborative Donor Hospitals

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**Key words.** Organ donation ; deceased donors ; living donors ; non-heart-beating donors.

**Abstract.** Over the past 10 years, the University Hospitals Leuven and their group of Collaborative Donor Hospitals (~20) have tried to maximize their contribution to the national and Eurotransplant donor pool. In this time period, 1042 potential donors and 703 effective donors were coordinated and their organs allocated through Eurotransplant. This activity represented ~30% of the national donor pool and ~32% of the national organ pool. For Belgium, the non-heart-beating donor activity represented 11.38% of all donors in 2006. Since 1997, 167 potential live donors have been screened in our center. Of these, 48 transplants (28.74%) (39 kidneys - 9 livers) have been performed. A boost of screened candidates was seen over the last 3 years, with a 500% increase of records being evaluated. Although the Belgian live donation activity remains one of the lowest in the world, there has been a clear increase over the last 3 years with about 10% of all kidney transplant activity originating now from live donors.

### Introduction

The abdominal transplant surgery department together with the department of transplant coordination, are responsible for the development and maintenance of the network of donor hospitals. This network is a corner stone in the number of available donors and organs for the local, national and international donor pool. Belgium has no centralized donor referral system and therefore donor referral is directly depending upon organization and management of regional networks of collaborative donor hospitals working together with transplant centers. Since 1997, the number of collaborative donor hospitals has increased from 10 in 1997 to 26 in 2006 (+160%). This article summarizes the evolution of the heart-beating, non-heart-beating, and living donors within the last 10 years in UZ Leuven and collaborative donor hospitals.

### Deceased donor activity

Between 1<sup>st</sup> January 1997 and 31<sup>st</sup> December 2006, 1042 potential and 703 effective donor procedures were processed and coordinated within our department. In average, 80% of the donor pool is in the group of the collaborative donor hospitals and about 20% in our university hospital (Fig. 1). Over the last 10 years, this donor activity represented in average 30% of all donor

activity within Belgium and 32% of all available organs within the Belgian organ pool.

Concerning the non-heart-beating donor activity, this is a program that was implemented since 2003 on a regional and national level. Within our department and group of donor hospitals, the contribution of the non-heart-beating donors to the deceased donor pool in 2006 is only 3.8% which is lower than the average national numbers (Belgium had an overall 11.38% non-heart-beating donor activity in 2006) (Fig. 2). Since 2004, 28 potential non-heart-beating donors were reported within our network of collaborative donor hospitals. Based on the Maastricht-classification, 26 (92.8%) were category III donors (switch-off) and 2 (7.2%) were category II donors (unsuccessful cardio-pulmonary resuscitation), which resulted in 9 (28%) effective procedures.

Concerning the donor profile, a drastic change was noticed over the last 10 years. The median age of the deceased donor population in our network increased from 42 years in 1997 to 51 years in 2006 ; +21.4%). In Belgium, the average donor age increased from 39.2 years in 1999 to 46.4 years in 2006. In our network, the number of donors above 70 years increased with 16%. The increase in age was associated with more comorbidity in the potential donor group such as hypertension (increase with 20%), diabetes type I or II (increase with 8%), obesity BMI > 27 kg/m<sup>2</sup> (increase with 28%). Despite presence of these co-morbidity factors, no major

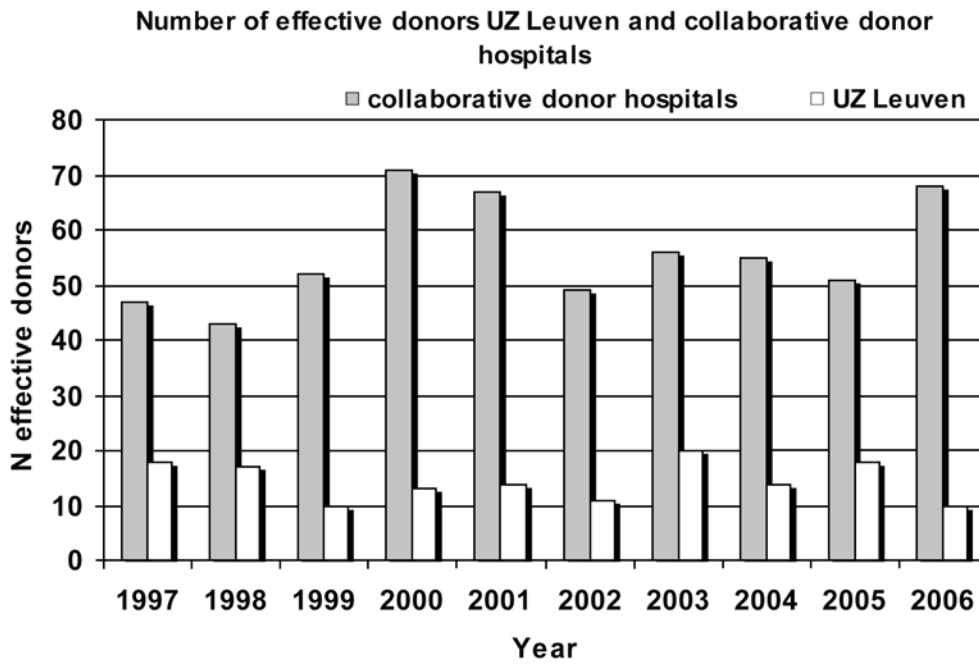


Fig. 1  
Number of effective donors UZ Leuven and collaborative donor hospitals

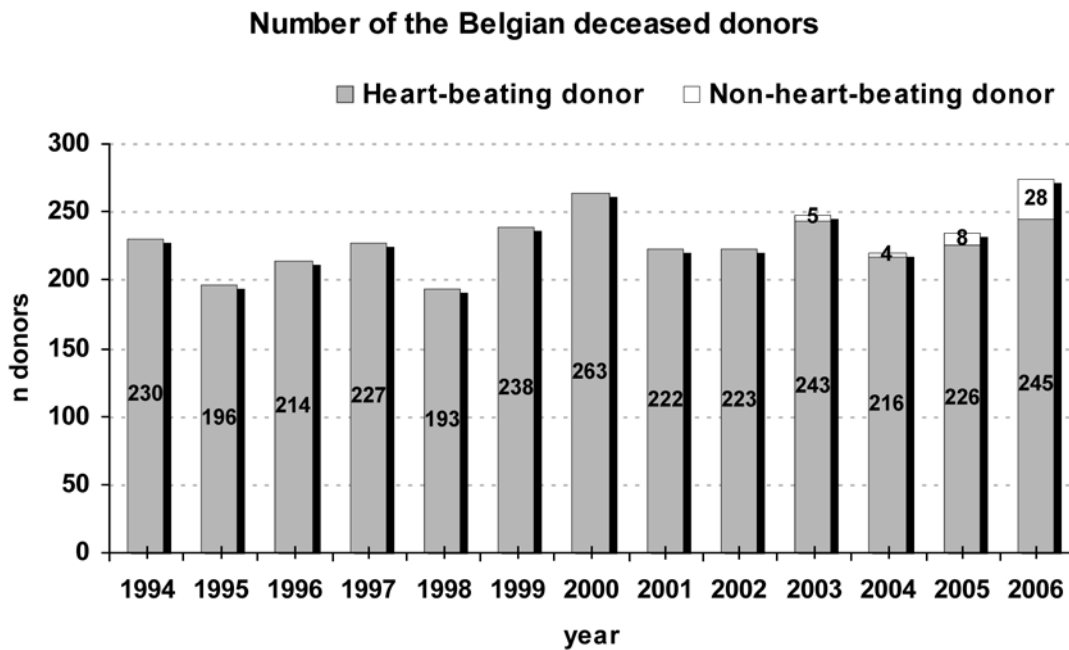


Fig. 2  
Overview of the Belgian deceased donors

impact on the average number of organs procured per donor was seen : 3.88 in 1997 versus 3.52 in 2006. The donor conversion (potential into effective) rate was not dramatically impacted through a policy of accepting more extended criteria donors (74.71% in 1997 versus 67% in 2006) (Fig. 3). An average 7% decrease in donor

conversion rate was seen both nationally and in our center (Fig. 3). The loss of donor potential was also impacted by refusal of relatives at the moment of donation. In our network, a decrease of 4% of family refusals was noted over the last 10 years (12% in 1997 versus 8% in 2006). A decrease in family refusal was also noted

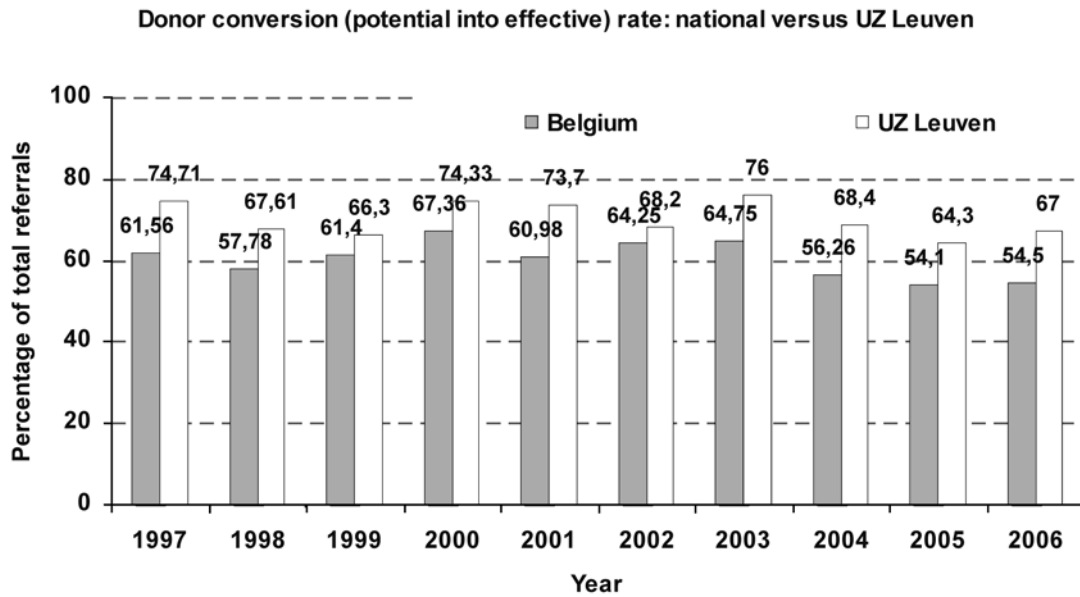


Fig. 3  
Donor conversion (from potential into effective donors) rate : national versus UZ Leuven

nationally (19% family refusal in 1997 versus 13.8% in 2007).

**Living donor activity**

In May 1997, a living donor kidney transplant program was started within our department. With assignment of a living-donor clinical transplant coordinator in January 2004, a dramatic increase in the screening of potential candidates was seen : 7 candidates were screened in 1997 versus 58 in 2006 (+728%). In 2000 our living donor program was extended to liver donation.

Overall between May 1997 and December 2006), 167 living donor candidates were evaluated, of whom 53 were accepted (31.73%). Among the 167 candidates, 137 were potential kidney donors (82.1%), 29 potential liver donors (17.3%) and 1 potential intestinal donor (0.6%). Of the 53 effective living donation procedures, 43 (81.1%) were kidney transplants and 10 (18.9%) were liver transplants. 109 candidates were not accepted (Table I). In 2006, 5.5% (7/128) of all kidney transplants were through live donors. In 2006, Belgium performed 9.6% of all kidney transplant activity through live donor procedures (41/429). The number of living liver donation, after a steep increase in 2003, decreased thereafter. In 2006, 8.05% of all liver transplant activity performed in Belgium was through living liver donation (19/236).

Table I

Living donation program UZ Leuven : reasons of refusal

| Reason of refusal                                    | N  | %   |
|--|----|-----|
| Medical – psychosocial – surgical                    | 49 | 45  |
| Mismatches   | 28 | 26  |
| – ABO  | 12 | 11  |
| – Positive X match                                   | 9  | 9   |
| – Size/age   | 7  | 7   |
| Donor withdrawal                                     | 8  | 7.5 |
| Receptor withdrawal                                  | 8  | 7.5 |
| Transplantation with deceased donor during screening | 5  | 4   |
| Miscellaneous  | 11 | 10  |

**Summary**

Over the last 10 years, the number of cadaveric donors in our region and in Belgium has remained relatively high (exceeding 20 donors per million people), and this is despite a deterioration of the donor profile population (increased age and co-morbidity factors). It may be that factors seen as contraindication in previous eras (for example advanced donor age > 70 year old) are not seen anymore as absolute contraindication. As a consequence, the use of extended criteria donors has substantially increased. The use of non-heart-beating donors and live donors is also currently expanding. Maximal efforts remain essential to make sure that all potential

deceased donors (heart-beating and non-heart-beating) are detected and to inform transplant candidates, their referring physicians and families on the possibility of living donation.

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