

Organ donation and management of the potential organ donor

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Abstract

Solid organs for transplantation are a scarce and valuable resource. For many patients transplant offers the hope of disease cure but unfortunately demand far exceeds supply and many will die before a suitable organ becomes available. It is important that potential donors are both identified and appropriately managed to ensure that their gift of donation benefits the maximum number of recipients.

Both donation after brain death and cardiac death present significant challenges. The pathophysiological changes that accompany brainstem death can significantly reduce the quality of organs retrieved and must be carefully controlled. Donation after cardiac death requires careful coordination to ensure that organs are retrieved in a timely fashion.

Keywords Deceased donor; donation after brain death, DBD; donation after cardiac death, DCD; organ donation; organ retrieval; transplantation

Introduction

For a large number of conditions solid organ transplantation remains the only realistic hope of extended disease-free survival. Every year many thousands of individuals are added to transplant waiting lists around the world. Unfortunately, the demand for organs far exceeds the supply of suitable donors and many patients will die before a suitable organ can be identified. It is thus important to ensure that all potential donors are identified and managed appropriately to maximize organ availability.

Although donation from live donors accounts for approximately 50% of kidney transplants the vast majority of other donated organs are obtained from deceased donors. Traditionally, donation followed the diagnosis of brain death but more recently an increasing number of organs are harvested from individuals following cardiac death. Donation after both brain death (DBD) and cardiac death (DCD) (previously termed heart-

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Learning objectives

After reading this article you should be able to:

- understand the general principles of organ donation
- understand the effects of brainstem death on donor organs
- discuss the management of the patient donating after brain death (DBD) and cardiac death (DCD)

beating and non-heart-beating donation), requires careful management to ensure that the maximum number of potential recipients can benefit.

Donation and transplantation activity

Solid organ transplants are undertaken in over 100 countries and approximately 100,900 transplants are performed per year.¹ Donation rate varies significantly between countries (Figure 1) as a result of differing religious, cultural, legal and organizational differences. Renal transplantation is the commonest procedure accounting for approximately 70% of all transplant activity. Liver, heart, lung and pancreas transplants account for 20%, 5%, 3% and 2% of global transplant activity respectively.

The deficit in organs for transplantation is changing the pattern of donation. Year on year transplant activity has been increasing but donations still fall short of waiting list demand. Figures from the UK (Figure 2) show a progressive increase in DCD donations over the last decade compared to donations after brain death.

General principles of organ donation

The path from identification of a possible organ donor to the successful transplant of a donated organ is highly complex and requires careful coordination of many, often geographically distant teams and individuals. Most countries have regional transplant coordinators who oversee this process. These individuals are an invaluable source of advice and support to both clinicians managing a potential donor, and the donor's family. Early referral to the transplant co-ordination team should be considered in all cases of potential donation.

Outcomes following solid organ transplantation are closely linked to the quality of the organ transplanted. In an ideal world, every transplant recipient would receive an organ from an 'ideal donor' who was a young (<45 years), previously fit, haemodynamically stable, brain dead donor. The shortfall of donors globally means that donation criteria have been 'extended' to include donors who would previously have been excluded. Although absolute contraindications vary slightly from country to country, they are normally confined to:

- HIV disease
- known variant Creutzfeldt-Jakob disease
- active invasive malignant disease in last 3 years (except primary brain and non-melanoma skin cancer)
- haematological malignancy (e.g. leukaemia, lymphoma)
- metastatic disease with high risk of transmission irrespective of disease-free duration (e.g. melanoma)
- untreated systemic infection.

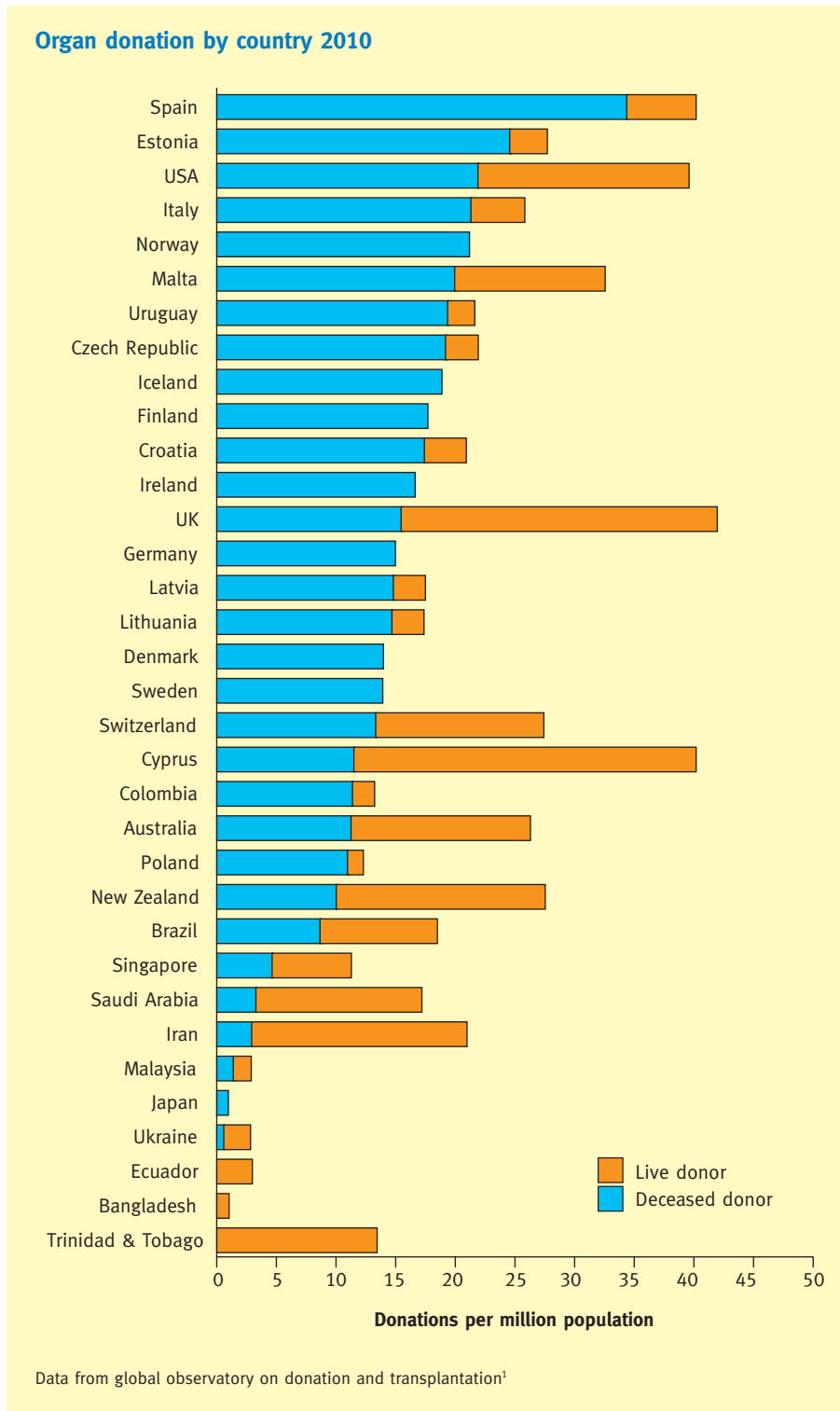


Figure 1

Most donors are less than 65 years old, but demand means many useful organs are being retrieved from older donors and there is no absolute upper age limit.

The decision as to which organs are retrieved from each donor depends on both the suitability of the organs and the donor's or relative's wishes. DBD donors can potentially donate heart, lungs, kidneys, liver, pancreas and small bowel but not all of

these organs will be suitable for donation in every case. In the UK, on average, 3.9 organs are retrieved per donor.² Heart and lungs are the organs most frequently unsuitable for donation and are retrieved in only 25% and 18% of UK DBD donations respectively.³

The nature of donation after cardiac death means that fewer organs are successfully retrieved from these donors and, on

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