



The Voice of Transplantation in the UK

The Provision of Services for Patients requiring a Renal Transplant



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Approval

The contents of this document have been approved by the Council of the British Transplantation Society, July 2010.

1. Overview

- The target of a 50% increase in renal transplantation by 2013 is likely to be achieved, and demand continues to rise, requiring an increase in provision of transplant services
- Transplantation involves a large amount of high intensity out of hours work
- Provision of a good quality transplant service requires a large multidisciplinary team with specific expertise in transplantation
- The continued availability of an operating theatre 24 hours a day for transplant surgery is vital
- Rationalisation of some transplant services may be beneficial
- A detailed workforce planning exercise is essential

2. Factors affecting provision

- As well as rapid advances in the science and management of renal transplantation, actual numbers of different types of transplants are changing. The Organ Donor Task Force Report ¹ in 2008 made 14 recommendations, accepted by the Government, with the aim of achieving a 50% increase in donation over 5 years. Early data suggests that rates of both donation and transplantation are rising: *Achieving Excellence* ² noted an increase in deceased donation from 789 in 2007/8 to 859 in 2008/9 (an increase of 9%), and an increase in living donation from 589 in 2005/6 to 927 in 2008/9 (an increase of 57%). Most notable has been the tremendous rise in donation after cardiac death (DCD or non-heart beating donation, DCD), from 195 in 2007/8 to 275 in 2008/9, which led to a 41% rise in transplants using organs from this source. Overall the number of transplants rose from 1453 in 2007/8 to 1570 in 2008/9, an 8% rise. By 2009/10 increases were maintained with 959 deceased organ donors (of which 335 were DCD donors and 624 Donation after Brainstem Death (DBD) donors).

- Several other considerations are important when predicting future numbers of transplants. Firstly, the implementation of the National Organ Retrieval Service (NORS)³, a funded and audited national plan to ensure all potential organs are retrieved, took place in April 2010. It is likely that this will lead to a further increase in deceased donation and therefore transplants. Secondly, transplants from DCD organs are likely to increase as use of these organs becomes more routine across the UK and more uncontrolled DCD programmes are instituted. Living donation rates vary widely between centres, and it is likely that living donation will increase as the approaches of the most active centres are adopted elsewhere (there were 1037 living donor kidney transplants in 2009-10)⁴. Furthermore, increasing numbers of patients untransplantable a decade ago are receiving organs using new techniques and protocols, including antibody removal for blood group-incompatible and HLA-sensitised patients (123 such patients were transplanted in 2009⁵), and HAART therapy for those with HIV. Patients with high levels of HLA antibodies account for some 20% of the waiting list, and clearly even if only a small number of these patients are transplanted this could represent a significant rise in activity. There is also evidence that criteria for acceptance for transplantation are being expanded, with more elderly and obese patients being transplanted^{6,7}. Transplanting patients with more co-morbidities will lead to an increasing demand on related services, such as cardiology and intensive care. Finally, demand continues to rise, with an inexorable increase in those on the waiting list for a transplant⁸.
- In summary, it is likely that the aim of a 50% increase in renal transplantation will be achieved, with clear implications for the provision of services.

3. Nature of renal transplant services

- Transplantation has always been characterised by a high emergency workload; this has been due to the need for trained surgeons to retrieve organs, often at night, and the need for the same or additional teams of surgeons for the urgent implantation of organs. The implementation of the NORS has dissociated retrieval from implantation and, although well funded, it remains to be seen whether resources will be adequate. However, the increasing number of deceased donations, and in particular DCD organs, as noted above, means that out of hours and emergency work will remain high. Typically, over 50% of the workload will be on this basis, if non-transplant work is excluded; the latest UK data shows that 68% of renal transplants were from deceased donors⁴.

- It has become clear recently that the time the organ is stored before transplantation (the cold ischaemic time) is a critical determinant of outcome in renal transplantation⁹. Data suggests that cold ischaemic times above 12 hours for DCD donor transplants and 18-20 hours for DBD donor transplants will result in inferior graft survival, and it is therefore crucial that transplantation is treated as a true emergency procedure, with rapid access to out-of-hours facilities, including laboratories and theatres.
- Another key factor in transplantation is the need for a large multidisciplinary team; this is described in detail in section 5, but it should be noted that the complex nature of renal transplantation requires a large team including several highly specialised fields, such as nephrology, transplant surgery and a clinical transplantation laboratory.

4. Components of a transplant service

4.1 Surgeons

- Traditionally, transplant surgical services developed on an ad hoc basis in relation to nephrology units. It is now recognised that transplant surgery is a highly specialised field, and that consultants should have completed two years in a unit dedicated to training in transplant surgery, having previously undergone training in general or urological surgery.
- It is not appropriate for transplant recipients to be managed, either electively or on an emergency basis, by surgeons without adequate training in transplantation. Whilst it is recognised that working patterns differ between units, and many transplant surgeons have interests in other sub-specialties of general surgery, it is vital that continuous cover is provided by a trained transplant surgical consultant.
- Dedicated transplant surgical rotas may mean high frequency rotas in small units, and some units remain understaffed.
- The Royal College of Surgeons Criteria for Consultant Appointment in Renal Transplantation 1998 suggested that renal transplant units should serve a population of 2 million, should be capable of achieving 75 transplants a year, and recommended that there should be an on call rota of at least 1 in 4, with a minimum of 5 transplant surgeons in each unit¹⁰.

- It should also be noted that the application of the EWTD to junior staff now means that staffing high intensity junior rotas can be difficult with small numbers (fewer than seven). Different solutions may be applied in different units, but it is inevitable that a consultant-delivered, rather than a consultant-led, service will increasingly become the norm.

4.2 Nephrologists

- It is essential that nephrologists with an interest in renal transplantation are involved in both the pre- and peri-operative care and subsequent follow-up of transplant patients. It is not appropriate for transplant recipients to be managed, whether electively or in the emergency situation, by nephrologists without experience in transplantation.

4.3 Living donor coordinators

- Recent initiatives by NHS Blood and Transplant to centrally fund living donor coordinators have been instrumental in the national rise in living donation (a 57% increase in the last 3 years). It is therefore recognised at a national level that dedicated living donor co-ordinators are essential for an effective living donor programme. *Achieving Excellence*² emphasised the importance of the 18 week pathway for living donation, and co-ordinators will be a key feature in its implementation. Attrition rates of potential donors vary between 30 and 50%, meaning that a high workload exists even for a small living donor programme. On average, one living donor co-ordinator is required for 30 to 40 live donor transplants performed each year, and this figure may be higher where complex cases are performed.

4.4 Recipient list co-ordinators

- In addition to dedicated co-ordinators for living donation, it is important that transplant units have co-ordinators whose remit is to organise the work-up and maintenance of patients on the list for deceased donor transplantation. This may involve arranging a series of work-up investigations, seeking additional opinions (such as cardiology or vascular services) where necessary, and regularly reviewing patients on the list to ensure that details remain correct and that the patient has remained fit for transplantation, particularly as more elderly patients with multiple co-morbidities are listed for surgery.

4.5 Histocompatibility laboratory

- Any transplant service requires a Histocompatibility Laboratory meeting BSHI standards, to perform tissue typing and cross-matching of donors and recipients, to provide expert advice on the relative importance of donor-specific or third party antibody pre-transplant, and to closely monitor donor-specific antibody after transplantation. The increasing emphasis on improving long term graft survival rates and the recognition that most chronic dysfunction is related to chronic antibody-mediated rejection, as well the development of new techniques for measuring antibody, mean that the role of the Histocompatibility Laboratory is likely to increase.

4.6 Radiology

- Transplant recipients require access to specific interventional radiological services, including ultrasound-guided biopsy and vascular access provision, renal artery angioplasty, nephrostomy and stent insertion and percutaneous drainage of lymphoceles and other collections. Nuclear medicine is required for isotope renal scans. A reliable duplex ultrasound service is also required to assess transplant renal blood flow in the peri- and post-operative periods.

4.7 Pathology

- Transplant histopathology is a specialist area which should be staffed by renal histopathologists with an interest in transplantation. Categorisation of rejection is becoming increasingly complex, with additional detail and tests such as those for antibody-mediated rejection. Reliable reporting is essential to ensure good graft survival and avoid overtreatment of patients with powerful drugs. A pathology service should be available for urgent biopsies at least 6 days a week, and out of hours biopsies may be necessary pre-transplantation for deceased donors.

4.8 Transplant clinic

- As transplantation grows, transplant clinics are becoming ever larger, since patients continue to attend for many years, with clinics attended by 500 to 1000 patients in some centres. As well as transplant nephrologists and/or surgeons, these clinics should be staffed by dedicated transplant nurses who are able to understand and monitor immunosuppressive therapy, and ensure that regular screening of recipients

(such as for skin cancer or bone disease) is carried out. Nurse-led annual review clinics are widely used to monitor long-term complications in renal transplant recipients.

- Furthermore, it is vital that dedicated transition clinics are in place for adolescents who are transferring to adult transplant clinics; this is a notoriously difficult time, with high rates of non-compliance, and these clinics allow carefully managed joint care by adult and paediatric transplant clinicians.

4.9 Theatre with 24/7 availability

- As stated above, much of the surgical workload in transplantation occurs on an emergency basis. There is also increasing evidence that a short cold ischaemic time is one of the main factors in good graft survival⁹. For these reasons it must follow that transplant patients require urgent access to the operating theatre, and a full-staffed emergency theatre must therefore be available at all times.

4.10 Anaesthesia

- Transplant patients often have a number of co-morbidities and renal failure leads to specific issues in the peri-operative period. Maintenance of adequate fluid balance and blood pressure during surgery is often difficult, but may be critical for the transplant. For these reasons, anaesthesia for transplantation should be provided by a consultant anaesthetist, ideally with an interest in transplantation. The availability of on-site Level 2 and Level 3 facilities are essential in any unit undertaking transplantation.

4.11 Emergency dialysis

- Any centre undertaking transplantation can expect to see delayed graft function in 25% or more of patients with deceased donors¹¹ and will therefore require access to facilities for urgent dialysis for these patients, especially if they have previously dialysed at another centre.

4.12 Pharmacy

- Immunosuppression, the treatment of post-transplant viral infections and the management of rejection are all becoming increasingly complex fields, and the services of a specialist renal pharmacist are invaluable in ensuring adequate dosing, checking drug interactions and monitoring treatments.

4.13 Rapid out of hours laboratory services

- Changes in blood electrolytes and other parameters can be rapid and life-threatening after transplantation, and is therefore essential that a rapid out of hours laboratory service (both biochemistry and haematology) is available at all times.

4.14 Immunosuppressive drug monitoring

- A number of the immunosuppressive drugs used in the prevention or treatment of rejection require regular monitoring of drug levels to ensure the optimum dosage. A laboratory that is able to perform this in a timely and reproducible manner is required.

4.15 Dietician

- Renal dieticians provide input into a number of important aspects of transplant care: ensuring adequate feeding of patients in the peri-operative period, particularly in those with complications, giving dietary advice specific to transplant patients (such as the need to avoid certain foods which might interact with medications or cause electrolyte disturbances) and in the provision of pre-transplant weight reduction services which are vital in helping overweight patients proceed to transplantation.

4.16 Microbiology

- As well as routine services, specialist virological expertise is required to detect and advise about infections encountered in transplantation such as BK virus, cytomegalovirus and the other human herpes viruses.

4.17 Psychological services

- Mandatory assessment by a psychiatrist may be required under Human Tissue Act regulations or as part of the pre-operative assessment of non-directed donors, or those with a significant psychiatric history. Ideally, a psychiatrist with an interest in transplantation should provide these services.

5. Strategies for services

5.1 Workloads/EWTD

- The European Working Time Directive came into force for junior doctors in 2009, and has been in force for consultants since 1998. The majority of both groups work beyond the 48 hour weekly limit¹² and this is likely to be more common in transplantation, with its high out of hours workload. If enforcement of the EWTD becomes more stringent, working patterns may need to change; this may mean larger transplant units, or annualisation of hours, with longer periods away from work.

5.2 Non-transplant commitments

- Some centres have a pure transplant (and dialysis access) surgical service, with no other commitments. Many however, involve surgeons in another sub-specialty, such as vascular or endocrine surgery, and may require general surgical on call. It is important that the opportunities for other sub-specialty interests continue, since in many centres when a 1 in 5 emergency surgical rota is staffed, additional time will be available for other elective commitments.

5.3 Centralisation or hub and spoke?

- There are compelling arguments for larger *surgical* transplant units, i.e. centres where transplantation is actually performed. These include the ability to avoid high frequency on call rotas and ensure EWTD compliance, the development of local expertise in partner specialties such as anaesthesia, radiology and pathology, and the flexibility to deal with an unpredictable workload. However, this does not imply that all transplant recipients need to be managed in such centres. Some units send patients to a single centre for transplantation, after which the patient is discharged back to be managed in the clinic at the referring centre. Surgeons and transplant nephrologists may also attend clinics at the referring centre, and contribute to the

pre-and post-transplant management of recipients. Nevertheless, it is essential that when patients are referred back to a non-transplanting centre, specific expertise exists in the management of these patients, which may mean individual clinicians having a specific interest in transplantation.

- Whilst a single model is unlikely to be successful for all, it may be important for a rationalisation of transplant services to take place, with the dual aims of ensuring provision of the highest quality service to all patients and allowing local flexibilities where appropriate.

5.4 Monitoring workforce

- Few data are available on the workforce involved in transplantation, and in particular surgery and nephrology consultants. This is in part hampered by the lack of a distinctive qualification in transplantation, which makes it difficult to ascertain how many junior doctors in training wish to pursue a career in transplantation. There are inadequate data on the number of existing consultants involved in transplantation, and no data on projected retirements. Given both the expected dramatic increase in transplantation and the problems in recent years with overproduction of trainees in some specialties, such as cardiac surgery, it is vital that detailed workforce planning is carried out, with an attempt to project numbers over a decade (since current training programmes are up to 10 years long).

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