A kidney donor describes and reflects on her experience, from her partner’s diagnosis with kidney failure, through assessment to transplantation and recovery.

Live kidney transplant from an unrelated donor

In this article...
- Signs and symptoms of renal failure
- Assessments for both donor and recipient
- Process and follow-up care for transplant patients
- Impact of live donation

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This article provides an insight into the experience of live donation from the donor and recipient perspectives from diagnosis until 18 months after transplantation. The lead author details the diagnosis of end-stage renal failure in her partner and their decision for her to donate a kidney.

Howard is 58 years old and, in common with many men, is keen to have as little as possible to do with healthcare providers. In April 2011, I had become concerned about a small wound on his nose caused by ill-fitting glasses; the wound did not appear to be healing as expected and I persuaded him to visit our GP. During this visit the GP measured his blood pressure, which was 161/96 and, in accordance with National Institute for Health and Clinical Excellence (2011) guidelines for stage 1 hypertension, blood tests were requested (Table 1).

Reducing the potassium level was a primary concern at this time, as untreated hyperkalaemia can lead to cardiac arrhythmias and arrest (Hudak et al, 1998). This was treated with salbutamol via a nebuliser, which was supplemented with intravenous infusion of glucose and insulin. The insulin promotes movement of potassium from the extracellular space back into the cells (Gross and Pistrosch, 2004). Salbutamol may not lower potassium in all patients, and some studies show that up to 40% of those who have a degree of kidney failure requiring renal replacement therapy (those who are dialysis dependent) are resistant to salbutamol (Gross and Pistrosch, 2004). Although Howard’s full blood picture indicated that he was likely to require dialysis, this treatment succeeded in reducing his blood serum potassium level from 6.2mmol/L to 4.9mmol/L (Table 1). He started on a low potassium diet in the first few days following diagnosis.

Howard was diagnosed with end-stage renal failure (ESRF) secondary to PKD. Without a transplant, he would need three five-hour haemodialysis sessions a week.

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5 key points

1. Live donation addresses the problem that there are too few kidneys available for deceased donors

2. Without a kidney transplant people with end-stage renal failure need haemodialysis

3. Research suggests that survival rates of transplanted kidneys is greater than those of cadaveric organs

4. Polycystic kidney disease can profoundly enlarge the kidneys, replacing much of the normal structure and reducing kidney function

5. Around half of patients with the most common type of PKD will progress to end-stage renal failure
Signs and symptoms
Patients with ESRF often experience uraemia. Typically, these patients will have raised blood urea and creatinine (Huether and McCance, 2004), both of which were elevated in Howard’s case.

Uraemia is an increase in blood urea nitrogen, which delays wound healing by preventing the granulation of new tissue (Kindlen, 2003). This may explain why the wound on Howard’s nose had failed to heal, the only outward sign that he was seriously ill.

Huether and McCance (2004) suggest that patients with ESRF normally have problems with fatigue, anorexia, nausea and vomiting. Howard did not complain of any of these symptoms. However, in retrospect his appetite was perhaps reduced and I had been aware of a malodour, which I later recognised as uraemia.

Howard was discharged from hospital once his blood chemistry was within a safe range.

Treatment
Approximately 50% of patients with the most common type of PKD will progress to end-stage renal failure (ESRF) (Table 2). At the point of diagnosis, Howard was found to already be in ESRF (also termed chronic kidney disease stage 5). Patients experiencing renal failure as a result of PKD may deteriorate below this level at diagnosis (Table 1).

The implications of the pre-transplant assessment for both Howard and I were discussed. We were fortunate to be able to attend one of the regular patient seminars delivered by the renal transplant coordinator and the transplant team within a few days. This seminar reaffirmed that a live transplant would provide the optimum outcome for Howard in terms of quality of life.

To gain access for dialysis, Howard had a dialysis catheter inserted in early June. The haemodialysis catheter has two lumens, which are inserted into the venous system and positioned with the tips in the right atrium and the superior vena cava, facilitating connection to the dialysis machine. The catheter was used instead of forming a fistula because Howard needed to start haemodialysis three times a week as soon as possible. His haemoglobin continued to fall while on dialysis and did not start to return to a normal level until after the transplant (Table 1).

Before any assessment was made, we were told there was a better than 50% chance that I would be able to donate a kidney to Howard. Kalble et al (2010) have suggested the survival rates of grafts (kidneys) from living donors are higher than those of cadaveric grafts. We were also aware that, if I was able to donate a kidney, the transplant could take place significantly sooner than if we had to wait for a cadaveric transplant.

Assessment
The overall aims of the pre-transplant assessment protocol within guidelines for live kidney transplantation are to ensure both donor and recipient are fit for transplant and that the potential for graft survival is good (British Transplant Association and Renal Association, 2011). In addition, pre-assessment has to establish that the donor will continue to have satisfactory kidney function after donation (Table 3).

The first area of investigation looked at our potential tissue compatibility, which involved blood tests to look at blood groups and antibody levels. These tests confirmed our compatibility; however, some non-compatibility issues can be

### Table 1. Howard’s Blood Results Compared with Normal Values

<table>
<thead>
<tr>
<th>Test</th>
<th>On diagnosis, 13 May 2011</th>
<th>During haemodialysis, 9 July 2011</th>
<th>After transplant, 15 December 2011</th>
<th>Normal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine (µmol/L)</td>
<td>815µmol/L</td>
<td>690</td>
<td>124</td>
<td>60-120</td>
</tr>
<tr>
<td>Urea</td>
<td>30.1mmol/L</td>
<td>13.8</td>
<td>5.1</td>
<td>2.5-6.7</td>
</tr>
<tr>
<td>Potassium</td>
<td>6.2mmol/L</td>
<td>3.6</td>
<td>4.3</td>
<td>3.5-5.0</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>11.3g/dL</td>
<td>10.3</td>
<td>14.1</td>
<td>12-14</td>
</tr>
<tr>
<td>Estimated glomerular filtration rate</td>
<td>6ml/min</td>
<td>52 ml/min</td>
<td>&gt;90ml/min</td>
<td></td>
</tr>
</tbody>
</table>

Source: Peate and Dutton (2012)

### Table 2. Stages of Renal Failure

<table>
<thead>
<tr>
<th>Stage</th>
<th>Glomerular filtration rate (ml/min)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90+</td>
<td>Normal kidney function but urine analysis or structural abnormalities of the kidneys or genetic trait point to kidney disease</td>
</tr>
<tr>
<td>2</td>
<td>60-89</td>
<td>Mildly reduced kidney function, and other findings (as for stage 1) point to kidney disease</td>
</tr>
<tr>
<td>3B</td>
<td>45-59</td>
<td>Moderately reduced kidney function with or without evidence of kidney damage</td>
</tr>
<tr>
<td>3B</td>
<td>30-44</td>
<td>Severely reduced kidney function</td>
</tr>
<tr>
<td>4</td>
<td>15-29</td>
<td>Very severe or end-stage renal failure</td>
</tr>
</tbody>
</table>

Source NICE (2008)
To ascertain Howard’s fitness for transplant, he underwent routine cardiac and respiratory investigations, and a brain scan to rule out cerebral haemorrhage, which is one of the complications of PKD (Jacob, 2012). As he has a close family history of bowel cancer, he also underwent a colonoscopy. It was important to establish if Howard had any pre-existing cancer as the drugs he would need to take for the rest of his life could exacerbate this condition. Immunosuppressive drugs, such as tacrolimus, are given to suppress lymphocyte production.

Once all these tests had established Howard’s fitness for transplant and my appropriateness as a donor, together with my fitness for surgery, non-medical assessment was required. This involved us being interviewed together by an independent assessor, who then saw me on my own to verify that I was not being coerced to donate my kidney. This is in accordance with UK Human Tissue Authority regulations (HTA, 2013).

I had made up my mind that I wanted to be a donor before I understood all the physical implications of having this surgery. The risks were explained to me and I understood that my renal function would not be compromised by having one kidney, although I might experience some fatigue initially while the lone kidney adapted. I very much wanted to be able to give Howard a kidney and trusted the renal team to not put me at any undue risk.

During the build-up to the transplant, my anxiety was far more focused on the surgery than on its implications.

**Live kidney transplantation**

The investigations caused a high degree of anxiety for us both, but we finally made it to the operating theatre on 15 September 2011. Fig 1 shows the position of a transplanted kidney. It is normal to not remove the diseased kidneys unless they grow excessively large (Jacob, 2012).

After surgery, we both spent two days in the renal high dependency unit. My renal function was closely monitored until it reached satisfactory levels of a GFR over 70ml/min and creatinine below 120µmol/L. We were discharged home after two weeks when Howard’s creatinine was below 200µmol/L, his wound appeared to be healing and the pharmacist was satisfied that he understood his drug regimen.

Following discharge, Howard continued to be closely monitored by the renal outpatients department. In the first couple of weeks after discharge, this meant visits three times a week, then twice weekly and gradually reducing to once every six weeks. On each visit, his creatinine level was tested, as a significant rise could indicate signs of rejection (Thomas, 2008). If picked up early, this can be rectified by adjusting the dose of anti-rejection drugs.

Howard also had a biopsy of the transplanted kidney at three months and again one year after the transplant. This is because this tissue can show signs of early rejection before creatinine levels change (Thomas, 2008).
I returned to work after a three-month recovery period. Since the transplant, Howard has experienced only one occasion when a raised creatinine level caused him to be readmitted to hospital for 24 hours. This was just after he had been discharged home and the warm weather had caused him to become dehydrated. He has had to learn to increase his fluid level carefully whenever the ambient temperature increases.

The renal team is satisfied that Howard fully understands the importance of correct fluid intake and of adhering to his drug regimen, which means we can now travel abroad.

Life for both of us has been good since the transplant, culminating in us getting married in August 2012. The transplant journey was challenging but the positive outcome made it worthwhile for us both. We hope our experience will encourage others to grasp the opportunity of live organ donation to enhance the quality of live for those with ESRF.

References

![Diagram of transplantation process](image-url)