Discharging patients from the nephrology clinic to primary care—will they get appropriate monitoring of renal function?

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Summary

Background: Chronic kidney disease (CKD) guidelines have been produced to allow affected individuals to be identified early and managed more effectively, thereby reducing cardiovascular risk and slowing the progression of CKD. The guidelines allow patients with stable early CKD, who were previously followed in nephrology clinics, to be discharged back to primary care for monitoring of their CKD.

Aim: To determine if patients discharged from the nephrology clinic have appropriate monitoring of renal function in primary care according to the UK CKD guidelines, and if patients are being referred back to the clinic appropriately.

Methods: All patients discharged from a weekly satellite unit general nephrology clinic over a 2-year period were identified (n = 160). Clinic letters, the local laboratory system and direct contact with the general practice were used to determine if the timing of tests of renal function were consistent with the UK CKD guidelines.

Results: Most subjects (88%) had CKD Stages 1–3 at the time of discharge (i.e. eGFR > 30 ml/min). After exclusion of patients with an incomplete management plan or insufficient time since discharge (n = 50), 85% of eligible patients (n = 110) had at least one measure of eGFR after discharge. In 65% (n = 84) of these patients, measurement occurred within 1 month of the correct timing according to the guidelines. Four patients were re-referred appropriately. There were no other patients who should have been re-referred due to deteriorating renal function.

Conclusion: Patients with stable early CKD get appropriate monitoring of renal function after discharge from the nephrology clinic to primary care and are also referred back to the renal clinic appropriately.

Introduction

In recent years, it has become evident that chronic kidney disease (CKD) is highly prevalent and associated with a high morbidity and mortality, particularly from cardiovascular disease.1–3 In 2002, the National Kidney Foundation of the United States proposed guidelines through the kidney disease outcomes quality initiative (K/DOQI) programme that divided CKD in to five stages based on the estimated glomerular filtration rate (eGFR) calculated using knowledge of age, sex and serum creatinine.3 In 2005, the United Kingdom followed suit with the UK CKD guidelines and from April 2006 laboratories across Scotland began to routinely report eGFR.2 Population screening studies suggest that 10% of the adult UK population have early CKD (Stages 1–3). This increases with age to ~20% over 65 years and 30% over 80 years (Table 1).2,4 By defining and classifying CKD, affected individuals can be identified early allowing effective management strategies to be implemented that reduce cardiovascular risk and slow progression of CKD.2
The UK guidelines recommend that the vast majority of patients with Stages 1–3 CKD can be managed in primary care. Patients with Stage 3 CKD should be referred to a nephrology specialist if there is a progressive fall in eGFR, heavy proteinuria, suspected systemic illness (such as systemic lupus erythematosis) or uncontrolled blood pressure. All patients with Stage 4 or 5 CKD should be either referred to or discussed with a nephrologist.2 The quality outcomes framework includes payment to General Practitioners for implementing aspects of the UK CKD guideline.

The implementation of the UK CKD guideline has, unsurprisingly, had an impact on new patient attendances at the nephrology clinic resulting in increased workloads. Our centre has reported a 48% increase in the number of new patient attendances.6 This is likely to be mirrored in other centres. In order to accommodate the increased number of new referrals, we have discharged selected patients previously followed in the nephrology clinic back to primary care for monitoring of their CKD in accordance with the UK CKD guidelines.

The aim of this study was to determine the number of patients discharged from the nephrology clinic, whether there was a management plan established on discharge, if appropriate tests of renal function are subsequently being performed in primary care, and if patients are being re-referred appropriately.

### Methods

Using the electronic patient record (EPR), we identified all patients discharged from the weekly general nephrology clinic at Inverclyde Royal Hospital between 1 June 2005 and 31 July 2007. The clinic serves a mixed rural and urban population of 125,000.7 Approximately five new consults and 25 follow-up consults are seen at this clinic each week. None of the patients seen are on renal replacement therapy (RRT). Patients who stopped coming to the nephrology clinic because they started RRT, transferred to another centre, were lost to follow-up or died were not included. Serum creatinine at discharge was established from the EPR and eGFR at discharge was calculated using the four variable Modification of Diet in Renal Disease (MDRD) formula.3 eGFR was then used to calculate CKD stage at discharge (Table 1).

Clinic letters were reviewed to ascertain if a management plan was sent to the General Practitioner. For the clinic discharge letter to be considered as containing a management plan, it had to contain information regarding the patient’s discharge, a request for the CKD to be monitored in primary care and details of when a patient should be re-referred to the nephrology clinic. If a discharge letter made no reference to any of these aspects, no management plan was considered to have been constructed. If reference was made to some of these aspects but without specific information pertaining to exactly when renal function should be monitored, the management plan was considered to be incomplete. The quality outcomes framework includes payment to General Practitioners for implementing aspects of the UK CKD guideline.

### Results

During the 2-year period between June 2005 and July 2007, there were 160 discharges from the clinic, whether there was a management plan established on discharge, if appropriate tests of renal function are subsequently being performed in primary care, and if patients are being re-referred appropriately.

### Table 1  Classification of chronic kidney disease based on the UK CKD Guideline2

<table>
<thead>
<tr>
<th>CKD Stage</th>
<th>eGFR (ml/min/1.73 m²)</th>
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<tbody>
<tr>
<td>1 and 2a</td>
<td>&gt;60b</td>
</tr>
<tr>
<td>3A</td>
<td>45.1–60</td>
</tr>
<tr>
<td>3B</td>
<td>30.1–45</td>
</tr>
<tr>
<td>4</td>
<td>15–30</td>
</tr>
<tr>
<td>5</td>
<td>&lt;15 or on long-term dialysis</td>
</tr>
</tbody>
</table>

*Originally, Stage 2 CKD was defined as eGFR of 60.1 ml/min/1.73 m² to 90 ml/min/1.73 m² and Stage 1 as eGFR ≥ 90.1 ml/min/1.73 m². eGFR is inaccurate at levels >60 ml/min/1.73 m², these stages are therefore grouped together. In Scotland, eGFR > 60 ml/min/1.73 m² is not calculated.5

bWith other evidence of chronic kidney damage for example structurally abnormal kidneys, haematuria or persistent proteinuria.
nephrology clinic at Inverclyde Royal Hospital. Fifty-one percent of these were female (n=81). The median age was 68 years and the median serum creatinine was 126 μmol/l. Figure 1 shows CKD stage on discharge. The vast majority of patients had CKD Stages 1–3 on discharge (88%, n=141). Median time from discharge until this study was 505 days.

Ninety-seven per cent (n=155) discharged patients had a management plan on discharge which was sent to the General Practitioner. In 16 cases this management plan was incomplete and either did not specify when renal function should be monitored (n=13) or there was no request to monitor renal function at all (n=3). Of the 160 patients who were discharged from the clinic, 10 were excluded from the analysis of subsequent measures of renal function because not enough time had lapsed from the time of discharge (n=9) or because of death (n=1).

Of the remaining 129 patients, 85% (n=110) had at least one measure of renal function after discharge from the nephrology clinic. In 65% (n=84) of these patients, measurement of renal function occurred within 1 month of the time recommended in the discharge management plan. The 19 patients who did not have their renal function monitored at all tended to be males (n=13) under 65 years of age (n=16) with CKD Stage 1/2 (n=11) and all of these patients were still alive at the time of the analysis.

Of the 21 patients with no management plan or an incomplete management plan, 90% (n=19) had their renal function monitored at the appropriate time interval according to the UK CKD guidelines.

Four patients were identified who should have been referred back to the nephrology clinic according to the management plan or the UK CKD guidelines and all of these patients had been referred back by the general practitioner.

Discussion

The introduction of the UK CKD guidelines has led to a large increase in the number of patients being identified with CKD and a substantial change in the clinical management of patients with CKD. Unsurprisingly, there has been a large increase in patients referred to nephrology clinics. However, the majority of patients with CKD (those with mild renal dysfunction who have low risk of progressive renal dysfunction) can now be managed in primary care. This has created an opportunity for patients with milder CKD who were attending nephrology clinics in secondary care to be discharged to primary care for follow-up of their CKD. As with any change in health care practice, it is important to ensure that quality of care is improved or at least not worsened by the change. Thus it is reassuring that our data show that, in a large number of patients discharged from the nephrology clinic, appropriate follow-up of renal function was achieved in primary care for the vast majority. The majority of patients who had early CKD (Stages 1–3). One patient had advanced Stage 5 CKD, but was a nursing home resident with multiple co-morbidities who had great difficulty coming to the hospital. This patient has been monitored closely by the General Practitioner with telephone advice from the nephrologists.

Within our department, prior to the implementation of the UK CKD guidelines, there were discussions about the likely impending increased workload and the best strategies for coping with this. Discharging selected patients with CKD back to primary care for monitoring was one such strategy and under these circumstances, it is our policy to send a clear discharge plan for CKD follow-up to the General Practitioner. As part of this departmental policy, the management plan should include information regarding how frequently renal function should be monitored and when a patient should be re-referred to the nephrology clinic. This information is based upon the UK CKD guidelines. It is therefore very reassuring that in the small minority of patients who did not have a clear discharge plan, follow-up of renal function was also appropriate. This implies that the CKD guidelines are being implemented in primary care without the need for nephrology input. Patients were re-referred to the nephrology clinic appropriately and more importantly there were no cases identified where a patient should have been re-referred but had not been.

Subsequent analysis of patients discharged from other nephrology clinics from within our regional service has shown equally high quality of renal...
function monitoring in primary care (data not shown).

It is possible that the quality of primary care chronic disease monitoring shows regional variation in the UK. This may relate both to socio-economic factors and primary care resource availability. There are 74 General Practitioners in the Inverclyde area serving a population of about 125,000. The population is relatively deprived with more than one in three living in the most deprived 15% of data zones across Scotland (as defined by the Scottish index of Multiple Deprivation 2004). It is reassuring that a high quality of renal function monitoring was achieved in a relatively deprived area and implies that social deprivation is not a barrier to high-quality management of other chronic illnesses, which are often more prevalent in deprived areas.

No chronic disease management programme will achieve 100% adherence and patient non-adherence is likely to explain some of the small group of patients who did not have their renal function monitored appropriately. The group were predominantly young males, a population previously identified as being more likely to be non-adherent to chronic disease management. It is likely that a similar proportion of patients with Stages 1–3 CKD followed in nephrology clinics would also not have renal function tested at appropriate intervals due to missed clinic appointments. One strategy which we have adopted to try to minimise non-adherence after discharge is to copy the clinic discharge letter with the management plan to the patient as well as to the General Practitioner.

Whilst these data are reassuring, it will be important to ensure that long-term monitoring is as effective. Similarly, management of CKD does not simply consist of monitoring kidney function. Future studies should also assess blood pressure control, cardiovascular risk reduction measures and monitoring of urine protein excretion in patients with CKD managed in primary care.

These findings have important implications for other specialties that deal with chronic disease. There is considerable overlap between the chronic management of conditions such as diabetes, hypertension, ischaemic heart disease and CKD. If monitoring and treatment of the milder cases is done in primary care there is likely to be an improvement in consistency and continuity of care for these patients.

**Conclusion**

Our data show that patients with stable CKD get appropriate monitoring of renal function after discharge from the nephrology clinic to primary care and are also referred back to the nephrology clinic appropriately.

**Conflict of interest:** None declared.

**References**