Managing chronic kidney disease in primary care: a quality improvement study
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Abstract
This paper outlines a quality improvement project implemented in the United Kingdom (UK). The aim of the study was to reduce inconsistencies of care in general practice in managing early chronic kidney disease (CKD) using a care bundle approach. Areas under scrutiny are prevalence recording of CKD, proteinuria measurement, blood pressure control, cardiovascular risk recording and self-management opportunities for patients. Early results have shown improvements in reliability using a Plan-Do-Study-Act methodology. The integration of a Patient and Service User Advisory Group into the project team has been invaluable.

Keywords
Chronic kidney disease, primary care, quality improvement, user involvement.

Introduction
In the United Kingdom (UK), there have recently been significant changes in the management of people with chronic kidney disease (CKD) in primary care. These changes have the potential to identify people at risk much sooner than before and, as a result, strategies to slow down the progression of the condition can be started much earlier.

Changes have included the reporting of estimated glomerular filtration rate (eGFR), (alongside serum creatinine) as a measure of kidney function, from 2006. At the same time, the Quality and Outcomes Framework (QOF) for General Practice included a new domain for CKD, with amendments to the domain in 2008 and 2009 (Figure 1).

Clinical indicator Points Payment stages
CKD 1: The practice can produce a register of patients aged 18 years and over with CKD (US National Kidney Foundation: stages 3–5 CKD) 6
CKD 2: The percentage of patients on the CKD register whose notes have a record of blood pressure in the previous 15 months 6 40–90%
CKD 3: The percentage of patients on the CKD register in whom the last blood pressure reading, measured in the previous 15 months, is 140/85 or less 11 40–70%

Figure 1. Clinical indicators for CKD in the QOF.

The QOF is a voluntary annual reward and incentive programme for all general practitioner (GP) surgeries in England, detailing practice achievement results. The QOF contains four main components, known as domains. The four domains are: Clinical Domain, Organisational Domain, Patient Experience Domain and Additional Services Domain. Each domain consists of a set of achievement measures, known as indicators, against which practices score points according to their level of achievement. Put simply, the higher the score, the higher the financial reward for the practice. The final payment is adjusted to take account of surgery workload and the prevalence of chronic conditions in the practice’s local area.

Despite even more recent initiatives, such as the publication of National Institute for Health and Clinical Excellence (NICE) guidance (2008), to improve care of people with CKD in
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primary care, inconsistencies in managing CKD in primary care remain (Crismon et al., 2010). In broad terms, NICE (www.nice.org.uk) helps those working in the health service and local authorities to deliver high-quality health care. NICE develops evidence-based guidelines on the most effective ways to diagnose, treat and prevent disease and ill health and also develops quality standards, gives recommendations for specific medications and has a wider remit to raise standards of health care around the world.

Clinical guidelines are recommendations by NICE on the appropriate treatment and care of people with specific diseases and conditions. NICE guidance for CKD was published in 2008 and covers diagnosis of CKD, treatment, care and referral advice (www.nice.org.uk/CG73).

Recent QOF data (2010–2011) have shown that 4.3% of the population were recorded as having CKD stages 3–5, whereas the actual prevalence of CKD stages 3–5 is estimated to be around 6–7% (de Lusignan et al., 2009). There is also a large variation between Health Authorities (2.6–5.2%) and individual practices (0.6–11.5%) (NHS Information Centre, 2011).

**Overall aims of the project**

We have undertaken a Quality Improvement (QI) project in 26 GP practices in England and Wales. The project is called ENABLE (Engaging with Clinicians and Patients to achieve a Better Quality of Care through Education and Empowerment) and is managed by Kidney Research UK, a charity that funds life-saving research into kidney disease, to improve the quality of life of those with kidney disorders and to increase public awareness of kidney health (www.kidneyresearchuk.org).

The project team comprises one patient (who also chairs the patient and service user advisory group), two renal nurses, two nephrologists and project managers. The work is funded by a grant from The Health Foundation.

The main aim of the project is to reduce inconsistencies of care in the areas of prevalence recording, proteinuria measurement, blood pressure control, cardiovascular risk recording and self-management opportunities for patients. The QI method used is the application of a care bundle (Thomas, 2011).

**Care bundles**

Care bundles are groups of evidence-based, high-impact interventions that are well-known in secondary but not primary care. A care bundle is a specific tool with clear parameters. It has a small number of elements that are all scientifically robust, that when grouped (bundled) together, rather than being undertaken as individual procedures, create much improved outcomes (Robb et al., 2010).

A care bundle is merely the aspirations of best practice distilled into a handful of clear, achievable, measurable actions. Typically a bundle will be made up of three to five such actions. These actions should work independently of each other and be based on high quality (ideally level 1) evidence. To encourage full compliance with the care bundle, success is defined as the

The application of all elements of the bundle at every opportunity; no credit is given for partial application, though practitioners are allowed to disregard elements if clinically indicated and explained at the time. The notion of defining reliable practice in this “all or nothing” approach is known as “composite reliability”. A care bundle approach aims to achieve only a 95% level of reliability. Thus they are positioned as tools to turn chaotic processes into ordered ones, not a means of achieving perfection.

The care bundle for CKD was designed in line with the following recognised standards:

- The National Clinical Guideline for Early Identification and Management of CKD in Adults in Primary and Secondary Care (National Institute for Health and Clinical Excellence, 2008).

Prior to this project, care bundles had almost always focused on clinical practice in highly controlled and specialised areas of hospital practice, such as intensive care and renal units. Care bundles have not routinely been implemented in primary care, despite the far larger volume of patients and opportunities to prevent harm. The national patient safety campaigns in the UK, for example the 1000 Lives Plus campaign in Wales (www.1000livesplus.wales.nhs.uk/), most of which heavily promote reliability and the use of care bundles, have been criticised for paying insufficient attention to improving safety in the primary care sector.

**Project design**

The ENABLE study “Enhancing care and saving lives of people with CKD”, coordinated by Kidney Research UK and funded by the Health Foundation, aims to improve the management of people with CKD in primary care.

The aims are

- To establish consistent implementation of best practice in people with stages 3–5 CKD as embodied in 2008 NICE and SIGN guidance using a care bundle.
- To build knowledge and understanding in CKD amongst primary care practitioners.
- To establish tools to facilitate self-management in people with stages 3–5 CKD.
- To disseminate the learning of the project.

Ethical approval was granted in October 2010 and the project is now under way in England and Wales, due to be completed in September 2012.
The care bundle for CKD

The care bundle for CKD is based on NICE guidance (2008). NICE guidance for CKD recommends a number of key priorities including: testing by estimated glomerular filtration rate (eGFR) for those at risk; annual proteinuria testing for those with CKD using an albumin-creatinine ratio (ACR); blood pressure targets of 140/90 mmHg for people with CKD and 130/80 mmHg for people with CKD who also have diabetes and/or proteinuria. Other recommendations include referral to specialist care and education for patients (www.nice.org.uk/CG73).

The care bundle consists of four practical activities that have to be applied when people with CKD attend the primary care clinic: asking people whether they wish to take part in a self-management programme; measuring proteinuria; prescribing blood pressure tablets if necessary and assessing cardiovascular risk (by the QRisk assessment tool). QRisk is a cardiovascular disease (CVD) risk score designed to identify people at high risk of developing CVD who need to be recalled and assessed in more detail to reduce their risk of developing CVD (Figure 2).

The difference between this intervention and normal care is that all activities have to be carried out at the same time.

A. Ask the patient whether they want to take part in a self-management programme.
B. Measure and document proteinuria and prescribe appropriate medication.
C. Document blood pressure and treat if above NICE (2008) targets.
D. Document cardiovascular (CV) risk using an appropriate CV risk calculator, for example, QRisk.

The self-management intervention includes written materials, a DVD and a group education session in selected practices (Figure 3).

User and carer involvement in the ENABLE project

A recent review has provided evidence of a range of benefits to researchers and participants of public and patient involvement (PPI) in health research (Staley, 2009) and the importance of this approach to the NHS has long been recognised (Boote et al., 2002). Staley (2009) reports that one of the impacts of public involvement in health research is that members of the public and researchers develop a more constructive and ongoing dialogue. The ENABLE project team has a patient representative who also leads the Patient and Service User Advisory Group (PSUAG). The PSUAG comprises eight people who each have experience of kidney disease, diabetes or heart disease. Their role is to develop and inform the project alongside other (clinical) members of the project team. The PSUAG has made significant suggestions and input to the development of the project, in particular the self-management materials including:

- Attending the grant application interview for project funding and contributing to the application for funding.
- Creating patient documentation and information and performing readability tests on the content of the self-management package.
- Providing personal and anecdotal evidence about their own experiences which were used when talking to health care professionals who wanted to join the project.
- Providing input to dietary advice sheets produced at the request of practices.
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- Co-developing and delivering self-management training to practices.
- Subsequent support at teleconferences with practices.
- Developing further educational materials for, and running, group education (patient) meetings.
- Developing materials which can be used by patients and practitioners once the project has finished.

A key strength of this group is that it includes service users from other health areas apart from renal care, which provides a valuable perspective. The most innovative aspect of the PSUAG’s role is to provide education to health care practitioners, especially in the area of how best to facilitate self-care. Members of the PSUAG receive the same honoraria for their time as health care practitioners in the project. The team feels that this is an important factor which recognises the value of service user involvement.

Benefits to members of PSUAG have been positive for personal wellbeing. One group member has said “being involved with this work has made me feel better about my condition as I know I am helping others”.

Training of GP practices

At the start of the project, a half-day training session was undertaken in each practice. Content included management of CKD, the QI method to be used (Plan-Do-Study-Act) (PDSA) and how best to facilitate self-management during consultations. The PDSA method is a tried and tested method that tests an idea by temporarily trialling a change and assessing its impact (NHS Institute for Innovation and Improvement). This approach is unusual in a health care setting because, traditionally, new ideas are often introduced without sufficient testing.

The four stages of the PDSA cycle are:

- **Plan** – the change to be tested or implemented
- **Do** – carry out the test or change
- **Study** – data before and after the change and reflect on what was learned
- **Act** – plan the next change cycle or full implementation

The training was undertaken by a renal nurse and a patient from the study team. Following training, ongoing support by telephone and email was also provided.

The settings within which the Bundle has been applied have included: a dedicated CKD clinic; a generic long-term conditions (LTC) clinic and ad hoc delivery. Practices submitted monthly practice-level and individual patient data to the study team. Practice-level data items are shown in Figure 4. Figure 5 shows how care bundle data are collected. Following collation of monthly results, a teleconference between the practice and a renal nurse plus patient from the study team was conducted to discuss overall reliability and tests of change (ways in which reliability can be improved) using a PDSA cycle. In addition, the teleconference provided opportunities for practices to discuss with an expert patient how to explain CKD to those who had the condition. The “labelling” of people as having CKD, is still causing some difficulties in the UK, with some authors debating the pros and cons of putting people’s names on the CKD register when they have CKD that is age-related (Firth, 2010).

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<tr>
<th>Number of registered patients aged &gt;=18 years</th>
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<tr>
<td>Number of patients on CKD register</td>
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<td>Observed prevalence of stages 3 to 5 CKD</td>
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<th>Number of patients on CKD register who have had quantitative proteinuria test in previous 15/12</th>
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<td>Percentage of patients on CKD register who have had quantitative proteinuria test in previous 15/12</td>
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<th>Number of patients on CKD register with a diagnosis of diabetes</th>
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<td>Number of patients on CKD register with a diagnosis of diabetes whose latest BP is &lt;130 mmHg</td>
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<th>Number of patients on CKD register with most recent proteinuria test showing either ACR&gt;70 or TPCR&gt;100</th>
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<td>Percentage of patients (in whom a quantitative proteinuria test has been performed) with ACR&gt;70 or TPCR&gt;100</td>
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<th>Number of patients with either ACR&gt;70 or TPCR&gt;100 whose latest BP is &lt;130 mmHg</th>
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<th>Number of patients on CKD register with most recent proteinuria test showing either ACR&gt;30 or TPCR&gt;50</th>
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<td>Percentage of patients (in whom a quantitative proteinuria test has been performed) with ACR&gt;30 or TPCR&gt;50</td>
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<th>Number of patients with either ACR&gt;30 or TPCR&gt;50 who are treated with an ACEI or ARB</th>
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Figure 4. Data items collected monthly from practices.
Results

Baseline data showed reported prevalence of CKD of 2–9% (mean 4.32%, SD 1.82). We have worked with practices to improve their reported CKD prevalence, especially if <3% at baseline.

Interim data have shown that the number of patients with CKD per month who have had the QI intervention applied has ranged from 1 to 33 (mean 5.96, SD 7.88). The aim is to achieve 95% reliability in delivering the care bundle each month, where 100% means that all aspects of the care bundle have been applied at one time. Reliability during the first month was in the range 0–100% with most practices recording 30–60%. Most practices have recorded 100% reliability after three to four months, although in some practices the numbers of patients seen are small (five to 10 patients/month).

By the end of April 2012 the care bundle had been applied in over 700 consultations and over 500 patients had received the self-management pack. Figure 6 shows how care bundle data reliability is tracked and has improved over time in one practice.

Limitations of the project

The project is being implemented in 26 GP practices, yet some practices have engaged more with the process and implementation than others. Ten practices are highly engaged and are applying the Bundle to more than 10 patients per month and are returning monthly data which are showing improvements. It is interesting to note that in primary care teams, QI programmes may receive less attention at certain times of year when there are other priorities such as immunisations for flu (usually in October–November each year) or end-of-year QOF targets to achieve. Another reason for non-engagement is cited as lack of time, but the project team has observed that often it can be due to one clinician alone trying to improve care when a team approach is required for successful implementation.

Implications for practice and research

This project is due to be completed in September 2012. Once completed, a resource pack will be freely available to download from www.kidneyresearchuk.org/enable. The pack will include training materials for practices on CKD and QI and resources for patients.
Although the project has been implemented in 26 GP practices, data collection has focused on the reliability of the care bundle and improvements in practice level data. In the future, the intervention needs to be tested, perhaps in a cluster-randomised trial in a larger number of practices. Long-term outcomes such as progression of CKD and number of cardiovascular events could be measured to make the study more robust, alongside more detailed qualitative data on the patient experience of self-management. An economic evaluation of costs/benefits would be an interesting addition.

**Conclusion**

Our experience thus far is that implementation of a care bundle within primary care is feasible, although the number of patients who have had the care bundle applied each month has been variable. Efforts are now being focused on increasing the penetration of the Bundle (to >50% of patients on the CKD register) within a smaller number of selected practices using a goal-driven approach. In the meantime, it is clear that renal care teams should continue to work with primary care practitioners to reduce inconsistencies of care. Many practices still require education and support, especially in the areas of CKD register validation and self-management facilitation. Finally, the integration of a Patient and Service User Advisory Group into the project team has been invaluable.

**References**


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Figure 6. Care bundle reliability.