

Quality and Productivity: Proven Case Study

Service redesign: early identification of patients at risk of developing end-stage kidney disease

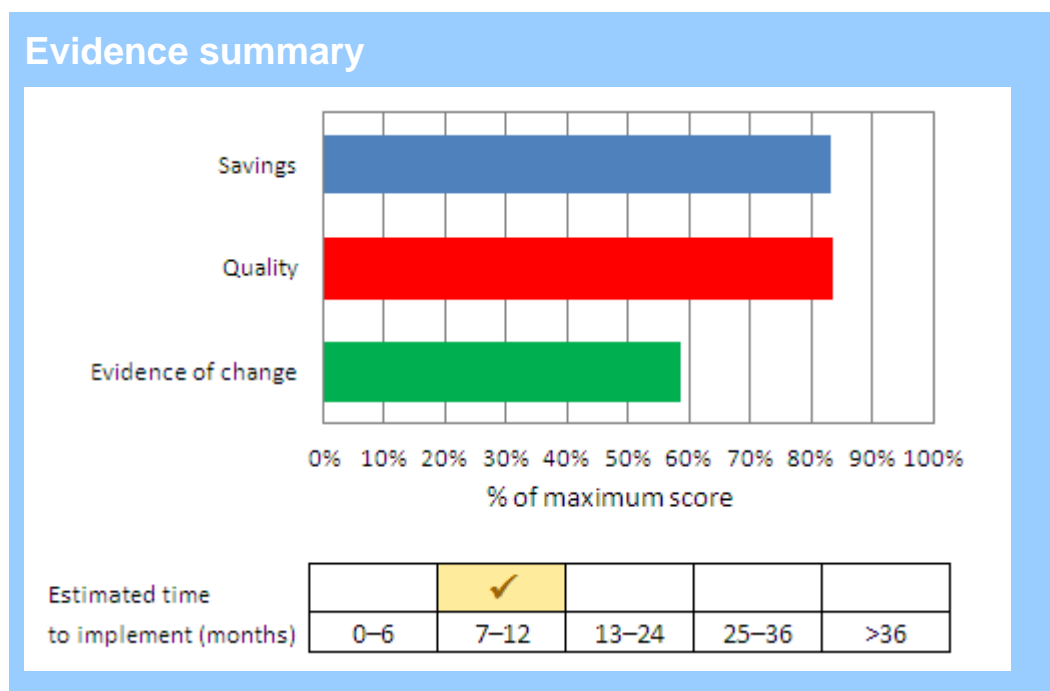
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Sharing QIPP practice: What are 'Proven Quality and Productivity' case studies?

The QIPP collection provides users with practical case studies that address the quality and productivity challenge in health and social care. All examples submitted are evaluated by NICE. This evaluation is based on the degree to which the initiative meets the QIPP criteria: savings, quality, evidence and implementability. The first three criteria are given a score which are then combined to give an overall score. The overall score is used to identify case studies that are designated as 'recommended' on NHS Evidence. The assessment of the degree to which this particular case study meets the criteria is represented in the summary graphic below.

Proven quality and productivity examples are case studies that show evidence of implementation and can demonstrate efficiency savings and improvements in quality.



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Updates

Published QIPP case studies are reviewed annually. One year after the case study has been published on the NHS Evidence website, the submitter of the case study is contacted to ask if there is further information pertinent to the case study, and the case study updated as required. Any changes to this case study are outlined in the table below.

Case study section	Update
Introduction	The update confirms the original report and expands the patient population of the initiative to include chronic kidney disease patients who do not have diabetes. The previous title of the initiative was 'A systematic diabetes renal service'. The new title reflects the wider remit.
Savings	Minor changes that show savings are continuing but in line with the original case study.
Quality	No significant changes.
Evidence	No significant changes.
Implementation	Further information has now been added.

Details of initiative

Purpose	To reduce the rate of loss of kidney function so that fewer people develop kidney failure and need dialysis treatment.
Description (including scope)	<p>The aim of the original case study 'Service redesign: systematic diabetes renal service' (10/0051) was to reduce the rate of loss of kidney function in people with diabetes mellitus so that fewer people developed kidney failure and required dialysis.</p> <p>The update has a widened remit to include all patients with chronic kidney disease rather than just patients with diabetes mellitus – people with diabetes are still included. The revised case study now follows up chronic kidney disease patients for longer than when it focused on a solely diabetic population.</p> <p>Chronic kidney disease is common, particularly in older people and those with diabetes or hypertension. A minority of chronic kidney disease patients develop end-stage kidney disease and need kidney replacement therapy. Early intervention can prevent or postpone progression to end-stage kidney disease, but at present many patients are unaware of their condition and it remains undetected. These patients do not get the best possible care until significant loss of kidney function has occurred.</p> <p>Diabetic nephropathy is the most frequent primary renal diagnosis for patients starting renal replacement therapy. A significant proportion of patients with diabetes do not receive treatment that would reduce their risk of developing progressive kidney disease. Patients with diabetes may see a nephrologist after they already have significant loss of glomerular filtration rate (GFR – a measure of kidney function).</p> <p>This situation can be improved by redesigning the traditional system of primary and specialist care.</p> <p>A disease management system was introduced as specified in the original case study.</p> <p>This comprised:</p> <ul style="list-style-type: none">• a diabetes population database linked to the laboratory database, covering 12,000 patients• weekly identification by a nephrologist of patients with low estimated glomerular filtration rate (eGFR) or deteriorating trend in eGFR• feedback to the patients' own clinicians (hospital diabetologists and primary care physicians) and communication of management advice by the nephrologist• a specialist diabetes kidney clinic to confirm diagnosis and plan treatment• patient education to support self-management and home blood-pressure monitoring• a letter written to the patient after every clinic attendance• once blood pressure and eGFR becomes stable, discharge to

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	<p>remote monitoring of eGFR</p> <ul style="list-style-type: none">• transfer to a multidisciplinary clinic more than 12 months before the predicted date of eGFR=10 ml/min/1.73 m² to prepare for renal replacement therapy. <p>Implementing this system removed the waiting list for diabetes renal consultations and reduced the number of diabetes patients needing dialysis.</p>
Topic	Long-term conditions and clinical rationalisation.
Other information	<p>The system of reviewing eGFR graphs each week for patients with diabetes (Rayner et al. 2011), outlined above and in the original report, has now been adopted by the pathology laboratory for all eGFR results on samples requested by GPs.</p> <p>According to Kennedy et al. (2011) a database has been developed at the Heart of England NHS Foundation Trust that allows laboratory staff to monitor chronic kidney disease for patients based in the community or hospital setting. eGFR charts are reviewed by clinical scientists, which enables identification of patients with deteriorating kidney function to be reported directly to their doctor.</p> <p>In-house software has been written to collate the eGFR results from different sources within the database and draw the graphs. The same eGFR thresholds are used as in the original report.</p>

Savings delivered

Amount of savings delivered	Savings were achieved from a reduction in number of patients receiving dialysis. As of October 2012, there were 64 fewer patients on dialysis giving a saving of £1.92 million per annum or £160,000 per 100,000 population.
Type of saving	These are a mixture of cash releasing and improved productivity. The submission states 'As a direct outcome of the reduction in patients requiring dialysis a dialysis unit has been closed'. There may be a reduction in expenditure to the commissioners if activity falls or improved productivity if the additional provider capacity is filled with additional activity.
Any costs required to achieve the savings	The submitter highlighted the loss of income for outpatients, which was absorbed by the provider, and stated the costs were already there. There may be costs to other organisations if the disease management system used by the submitter's organisation is not available locally.
Programme budget	Endocrine, nutritional and metabolic.
Supporting evidence	Financial savings may grow: the impact on the number of patients

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requiring dialysis will become clearer over a period of years. Calculating this will require complex modelling.

Quality outcomes delivered

Impact on quality of care or population health

Through population surveillance, early identification of patients at risk and early intervention, there is a reduction in average progression of eGFR, improved preparation for dialysis and transplantation, and reduced need for dialysis.

This system also reduces the need for outpatient clinic appointments, which allows new patients to be seen more quickly.

Impact on patients, people who use services and/or population safety

From October 2012 a further outcome of the initiative is 64 fewer patients requiring dialysis at the Heart of England NHS Foundation Trust than predicted from modelling performed since April 2007.

Impact on patients, people who use services, carers, public and/or population experience

Patients at risk of progressive kidney disease:

- have improved understanding of their condition and of self-management
- need fewer outpatients consultations
- experience shorter new patient waiting times.

Supporting evidence

Patients classified as at high, medium or low risk for progressive kidney disease using:

- age, comorbidities
- eGFR and urine albumin:creatinine ratio.

Referral of high-risk patients to nephrologists.

e-consultations between generalists and nephrologists.

Evidence of effectiveness

Evidence base for case study

Understanding that monitoring GFR and specialist triage could identify patients at risk of progressive kidney disease and result in earlier treatment with slower progression of change in eGFR and reduced need for dialysis. Initiative is based on the medical director recognising the need for this surveillance and implementing the initiative.

Evidence of deliverables from implementation

Example is from Heart of England NHS Foundation Trust. It started in August 2004 for people with diabetes.

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Where implemented	Birmingham and Solihull.
Degree to which the actual benefits matched assumptions	More than expected. It was initially assumed that there might be a delay in development of renal failure. However, even with increasing numbers of patients with diabetes and a growing elderly population, the need for renal replacement therapy has been reduced.
If initiative has been replicated how frequently/widely has it been replicated	Used by Kaiser Permanente in Hawaii, USA.
Supporting evidence	No further information provided.

Details of implementation

Implementation details	<p>In the original case study (Rayner et al. 2011), it was explained that a nephrologist developed a database to monitor eGFR graphs of diabetes patients each week to identify those with worsening kidney function.</p> <p>This model has now been adopted by the pathology laboratory for all eGFR results on samples requested by GPs. In-house software has been written to collate the eGFR results from different sources within the database. The same eGFR thresholds are used as in the original case study.</p> <p>For further details see The Health Foundation and the presentation by Kennedy et al. (2011).</p> <p>Recommended implementation plans are for laboratory-based clinical chemistry professionals to review eGFR graphs and urine albumin:creatinine ratios to identify patients at risk.</p> <p>The new initiative increases the number of patients screened because using the laboratory database allows the screening of all patients, including those in the community. Previously only patients with diabetes attending diabetic outpatient clinics were included. This model could be adapted and implemented by other trusts and will potentially have an impact on the wider population.</p>
Time taken to implement	Implementing the monitoring system in the pathology laboratory and the workflow management of those patients identified as at risk could take up to 1 year.
Ease of implementation	<p>The ease of implementing the laboratory-based patient risk identification model is yet to be judged.</p> <p>The changes to the outpatient clinic arrangements and consultation style are easy – apart from the culture change</p>

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	required in writing letters directly to patients.
Level of support and commitment	<p>There may be an initial rise in work levels as patients are identified earlier. This should be balanced by earlier discharge of follow-up patients.</p> <p>Consultant nephrologist dedication is required to review weekly reports. This will be replaced by laboratory staff review of eGFR graphs and presentation of high-risk patients to a nephrologist.</p>
Barriers to implementation	Trust outpatients income is sacrificed under Payment by Results.
Risks	Acceptability to patients and clinical colleagues may be a risk if it is not well communicated. This can be managed by explaining surveillance arrangements to patients before discharge and speaking widely with GPs and hospital colleagues.
Supporting evidence	No further information provided.

Further evidence

Dependencies	<p>Good IT support. Implementing this initiative may require some reconfiguration of the electronic patient records system, depending on the trust.</p> <p>No IT costs were identified at Heart of England as part of implementation.</p>
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Contacts and resources

Contacts and resources	<p>If you require any further information please email: qipp@nice.org.uk and we will forward your enquiry and contact details to the provider of this case study. Please quote QIPP reference 10/0051r in your email.</p> <p>Kennedy D, Rayner, H, Raju J et al. (2011) Use of clinical laboratory databases to enable early identification of patients at highest risk of developing end-stage kidney disease. PowerPoint presentation available from The Health Foundation [online; Accessed March 2013]</p> <p>Kennedy D, Rayner, H, Raju J et al. (2011) Use of clinical laboratory databases to enable early identification of patients at highest risk of developing end-stage kidney disease. Poster available from The Health Foundation [online; Accessed March 2013]</p> <p>Rayner HC, Hollingworth L, Higgins R et al. (2011) Systematic</p>
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[kidney disease management in a population with diabetes mellitus: turning the tide of kidney failure](#). BMJ Quality & Safety
doi:10.1136/bmjqs-2011-000061

For further information on the early identification and management of chronic kidney disease, see:

[Chronic kidney disease](#). NICE quality standard 5
[Chronic kidney disease](#). NICE clinical guideline 73

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