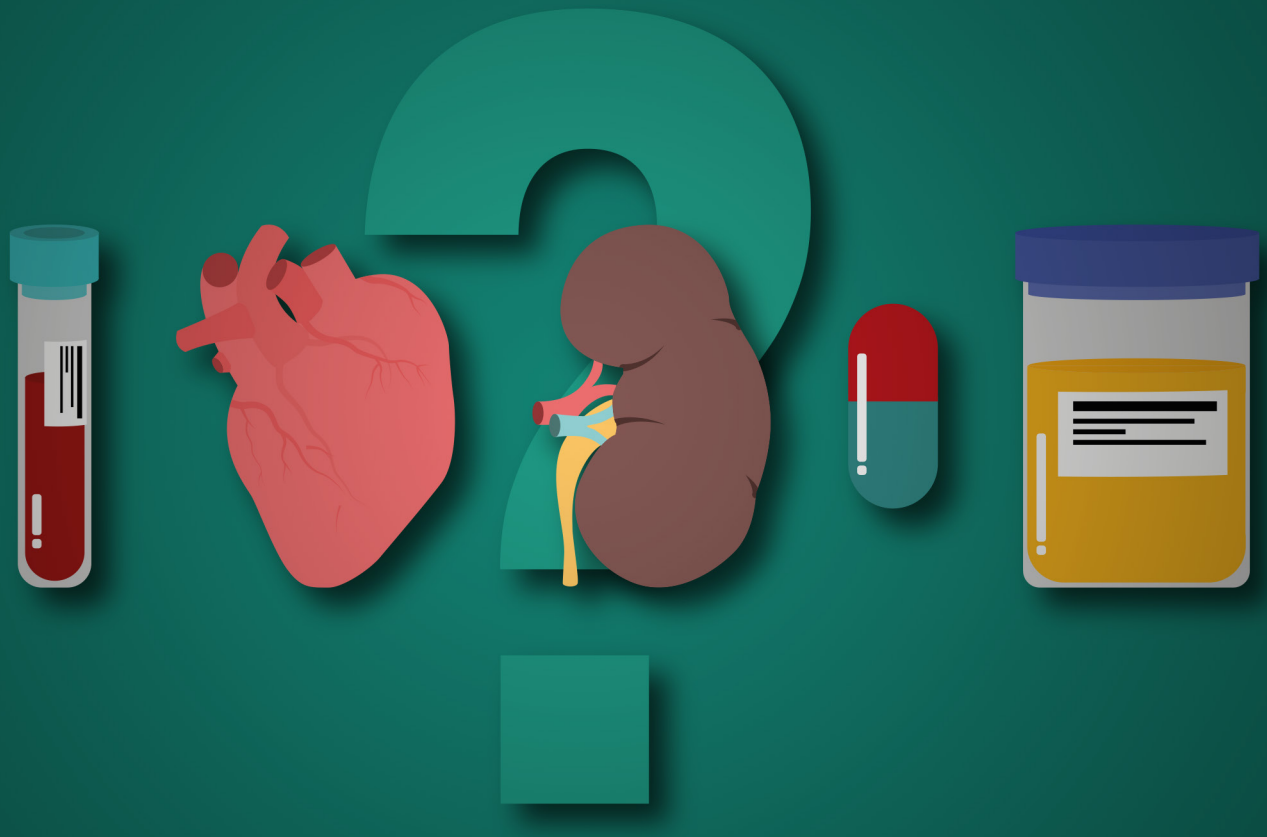
Monitoring Chronic Kidney Disease: What does the evidence say?



At a glance

This brief summarises the evidence and implications for Chronic Kidney Disease (CKD) monitoring from multiple studies at the University of Oxford, carried out under an NIHR Programme Grant.

This work points to three main implications:

1. **Annual monitoring of disease progression in CKD in primary care may not be justified.**

2. **Laboratories should switch to using CKD-EPI for the calculation of eGFR-creatinine if they have not done already.**

3. **Health professionals should consider the terminology they use when discussing CKD with patients to avoid causing unnecessary anxiety.**

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Background

Chronic kidney disease (CKD) is a long-term progressive condition with no cure, only management to slow its progression.

NHS Kidney Care estimates that the annual cost of chronic kidney disease (CKD) to the NHS is £1.4 billion – more than breast, lung, colon and skin cancer combined (£1.3 billion), despite not being anywhere near as prominent in the cultural consciousness.

Much of this cost comes from the associated complications of kidney disease and their management, mainly cardiovascular disease. The majority of the death and illness of kidney disease is attributable to this.

Clearly there is a need to understand how best to manage CKD for both people's health and wellbeing, as well as NHS costs. However, NICE guidance on CKD management is currently based on expert consensus rather than evidence based. This programme of work aimed to help address this.

Measuring Kidney Function:

The 'Glomerular Filtration Rate', GFR, is gold standard for measuring kidney function. However, this is a complex procedure involving the injection of a marker and the measuring of how well it is filtered out from the blood, hence it is generally not routinely performed in primary care.

Instead, the estimated GFR (eGFR) is used. This is a mathematically derived estimate based on a proxy measurement, such as serum creatinine level, and the patients age, sex and race.

Methods

Our studies looked at a wide range of CKD associated elements, such as national trends and variations in how CKD is monitored, different methods and models of assessing kidney function and cost-effectiveness of CKD monitoring. Techniques and studies used included:

1. Database analysis, such as the Clinical Practice Research Datalink (CPRD)
2. Systematic reviews and meta-analyses (the scientific gold-standard for evidence)
3. Primary clinical research
4. Qualitative interviews and focus groups
5. Health economic modelling

Summary of main findings

1. Two classes of treatment are most likely to have a positive impact on CKD: lipid-modifying drugs (such as statins) and, for patients with diabetes, glycaemic control medications. However, these treatments would usually already be indicated in these patients e.g. due to dyslipidaemia or diabetes.[1]
2. There has been a huge increase in the use of blood and urine tests for the monitoring of CKD, corresponding to the introduction of these indicators to the Quality and Outcomes Framework (QOF).[2,3]

Summary of main findings cont.

3. There was no clear difference in the predictive power of conventional (serum creatinine) versus newer (cystatin-c) laboratory methods for assessing kidney function.[4]
4. The accuracy of different methods of calculating estimated GFR to monitor CKD progression was assessed. Laboratories should switch to the more accurate CKD-EPI method, if they have not done so already.[5]
5. Changes in kidney function in a primary care population happen slowly and typically at the same rate, no matter the initial stage of diagnosis. Observed changes in this population are typically more likely to be due to noise in the eGFR measurement (error).[6]
6. The terms "chronic" and "disease" act as barriers in communication between health practitioners and patients. [7,4]
7. Our cost-effectiveness analysis found that CKD monitoring had little effect on predicted health outcomes. The reason for this was that, the majority of people who would be put on to statin treatment for CKD would already be put on the treatment due to their cardiovascular risk.[4]

What changes or actions do the findings point to?

1) Annual monitoring of disease progression in CKD in primary care may not be justified.

The main implications for CCGs and the NHS from our work is that, overall, the benefit and cost-effectiveness of monitoring progression of CKD in primary care is questionable – its growing use is not justified for the purposes of treatment initiation or dosage changes.

The main reason for this was that, most people who would be put on to treatment for CKD were already put on the same treatments due to their cardiovascular risk.

However, that is not to say monitoring is without value. There may be a more complex arguments for regular monitoring, such as informing patients to motivate lifestyle changes, or medication adherence, though at present there is little research or evidence in this area.

2) Laboratories should switch to using CKD-EPI for the calculation of eGFR-creatinine if they have not done already.

A systematic review and meta-analysis of the leading equations for estimated glomerular filtration rate (GFR) showed that both underestimate true renal function. At higher levels of renal function, which reflects primary care populations, the CKD-EPI equation gave more accurate estimates of GFR than the MDRD equation.

3) Health professionals should consider the terminology they use when discussing CKD with patients to avoid causing unnecessary anxiety.

Finally, our work shows that the terms "chronic" and "disease" can act as barriers in communication between health practitioners and patients. These terms can be frightening and may cause unnecessary anxiety in patients, especially when kidney disease is in the early stages or normal for people in that age group.

Further information and references

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