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Using chronic kidney disease trigger tools for safety and learning:

a qualitative evaluation in East London primary care

Abstract

Background
An innovative programme to improve identification and management of chronic kidney disease (CKD) in primary care was implemented across three clinical commissioning groups (CCGs) in 2016. This included a falling estimated glomerular filtration rate (eGFR) trigger tool built from data in the electronic health record (EHR). This tool notifies GP practices of falling eGFR values. By alerting clinicians to patients with possible CKD progression the tool invites clinical review, a referral option, and written reflection on management.

Aim
To identify practitioner perceptions of trigger tool use from interviews, and compare these with reflections on clinical management recorded within the tools.

Design and setting
A qualitative analysis set in 136 practices across East London during 2016–2018.

Method
Eight semi-structured interviews with GPs and practice staff were recorded, and thematic analysis was undertaken using framework analysis. The reflective comments recorded in the trigger tools of 1921 cases were categorised by age group, referral status, and by the drop in eGFR (>15 or >25 ml/min).

Results
Three themes emerged from the interviews: getting started, patient safety, and trigger tools for learning. Well-organised practices found the tool was readily embedded into workflow and expressed greater motivation for using it. The tool was seen to support patient safety, and was used for learning about CKD management, both individually and as a practice. Reflective comments from 1921 trigger tools were reviewed. These supported the theme of patient safety. The free-text data, stratified by age, challenged the expectation that younger cases, at higher risk of progressive CKD, would have higher referral rates.

Conclusion
Building electronic trigger tools from the EHR can identify patients with a falling eGFR, prompting review of the eGFR trajectory and management plan. Interview and reflective data illustrated that practice use of the tool supports the patient safety agenda and encourages learning about CKD management.

Keywords
chronic kidney diseases; patient safety; primary care; tool use behaviour; trigger tools.

INTRODUCTION

The prevalence of chronic kidney disease (CKD) stages 3–5 in the UK is estimated to be 5% to 6%.[1,2] Early identification of people with CKD in primary care, particularly among those with risk factors such as diabetes and hypertension, enables proactive management of blood pressure, cardiovascular risk and lifestyle factors, and referral to specialist services where there is evidence of progressive disease.[3]

The UK national CKD audit in primary care demonstrated that, on average, 70% of biochemically confirmed cases of CKD (stages 3–5) were given a diagnostic Read Code. There was wide variation between practices, with the proportion of uncoded CKD cases ranging between 0% and 80%.[1] Other studies have shown varying GP expertise in managing CKD.[4,5] The second part of the national CKD audit linked hospital data on outcomes to the cases identified in primary care. There were associations between lack of coding in primary care with higher rates of unplanned hospital admissions, acute kidney injury admissions, and deaths.[6]

In 2016 three East London clinical commissioning groups (CCGs) and the local renal unit developed an innovative community kidney service. This system-wide change was conceived as a renal learning health system,[7] in which data from all parts of the system are transformed into knowledge and used as feedback to improve both the system organisation and clinical performance within it. There are 136 practices within these CCGs, serving a population of 850 000 patients. At the start of the project, practice diagnostic coding for CKD ranged from 20% to 80%, reflecting the national average. In addition, late referral of patients with progressive CKD to specialist end-stage renal disease services, defined as those who needed renal replacement therapy within 3 months of being referred, was 39%, compared with the national average of 16.1%.[8] Previous quality initiatives (QI) in the three study CCGs had used prevalence searches; to find and code cases and improve management by regular review, and dashboards to summarise comparative practice data.[9,10]

The community kidney service had four components:

- a package of electronic tools that support practices to identify patients requiring diagnostic coding, improvements to blood pressure (BP), and cardiovascular management. Trigger tools, using pathology results from the electronic health record (EHR), based on the Modification of Diet in Renal Disease (MDRD) equation, are run monthly by practices and identify CKD cases with a falling eGFR. This article focuses on these trigger tool alerts;
- regular practice facilitation on clinical data management offered routinely by the Clinical Effectiveness Group (CEG) supported this package.[11] Additional

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How this fits in

It is known that trigger tools have been used to identify patient safety events in UK primary care since 2009. Their use has been mainly limited to the measurement of the rate of adverse events and they are not widely used in primary care settings. This study shows that falling estimated glomerular filtration rate (eGFR) trigger tools based on results in electronic health records can be easily incorporated into the regular work of general practice. Interview and reflective data from the tools demonstrated that practice use of the trigger tool supported the patient safety agenda, and in addition encouraged team and individual learning about chronic kidney disease management.

renal-specific clinical facilitation, which focused on the importance of CKD coding, cardiovascular disease, and BP management, was offered to practices in the lowest decile of CKD coding;

- a virtual CKD hospital clinic enabling nephrologists to see the full primary care EHR, with informed patient consent, and document advice in the shared record. The virtual clinic has a short wait time (approximately 7 days) and triages patients who require further investigation into nephrology outpatient clinics. Less than 20% of referrals require a traditional outpatient appointment; and
- an education programme for patients and practitioners. Continuing professional development sessions for GPs and practice nurses were delivered at CCG, cluster, and practice level. Patient education sessions for those referred into the service were led by specialist renal nurses. These group and individual sessions, based in community facilities in each CCG, used conversation maps to provide information and encourage lifestyle changes to improve health.[12]

Trigger tools

Triggers are defined as easily identifiable flags, occurrences, or prompts in patient records that alert reviewers to potential adverse events that may otherwise be undetected.[13] Trigger tools, such as the IHI Global Trigger Tool for Measuring Adverse Events,[14] are widely used in US secondary care to estimate the prevalence of errors and harms. In UK primary care trigger tools have also been used to estimate the prevalence of patient safety events.[15] However, the time required for case note reviews, and the relatively low yield of events (around 9%), has limited uptake across general practice.

Adapting the tool to identify patient safety events from focused searches in routine clinical data recorded in the EHR is more time efficient, produces a higher rate of potential errors, and is welcomed by GPs as a safety intervention that identifies patients who otherwise fall *'… "under the radar" of safety'*.[13]

Trigger tool for progressive CKD

This quality improvement programme introduced the falling eGFR trigger tool. This patient safety tool provides a practice alert when a new eGFR value <60 mL/min/1.73 m^2 is preceded by one with a value that is 10 mL/min/1.73 m^2 greater. The rationale for introducing this tool is that identification of progressive CKD requires observation of eGFR over time. The tool encourages clinicians to undertake a notes review and examine the graph of eGFR trajectory. It provides a safety 'backstop' for busy clinicians viewing results, and invites reflection on whether clinical review or referral is indicated. The trigger tool is run monthly in participating practices. Figure 1 shows the trigger tool practice interface.

This study aimed to identify practitioner perceptions of trigger tool use and value from interview data, and compare these with the written reflections by practitioners on clinical management recorded within the tools.

METHOD

The authors conducted eight semi-structured interviews with practice staff. Free-text data from the reflection column from 3400 trigger tools from all practices in two participating CCGs were collected and reviewed. Further analysis was confined to 1921 trigger tools from a subset of patients who were older (aged ≥80 years) and patients who were younger (aged ≤60 years). Using both datasets enabled the authors to compare the practitioner *perceptions* of the trigger tools (from the face-to-face interviews) with the *actions* of clinicians (based on the reflective comments).

Interviews

Practices from the three project localities, and known to the research team, were contacted to request participation in the study, providing a purposive convenience sample. In total there were eight practices and interviews were conducted during 2018. Interviews with GPs relating to the emergence of themes continued until data

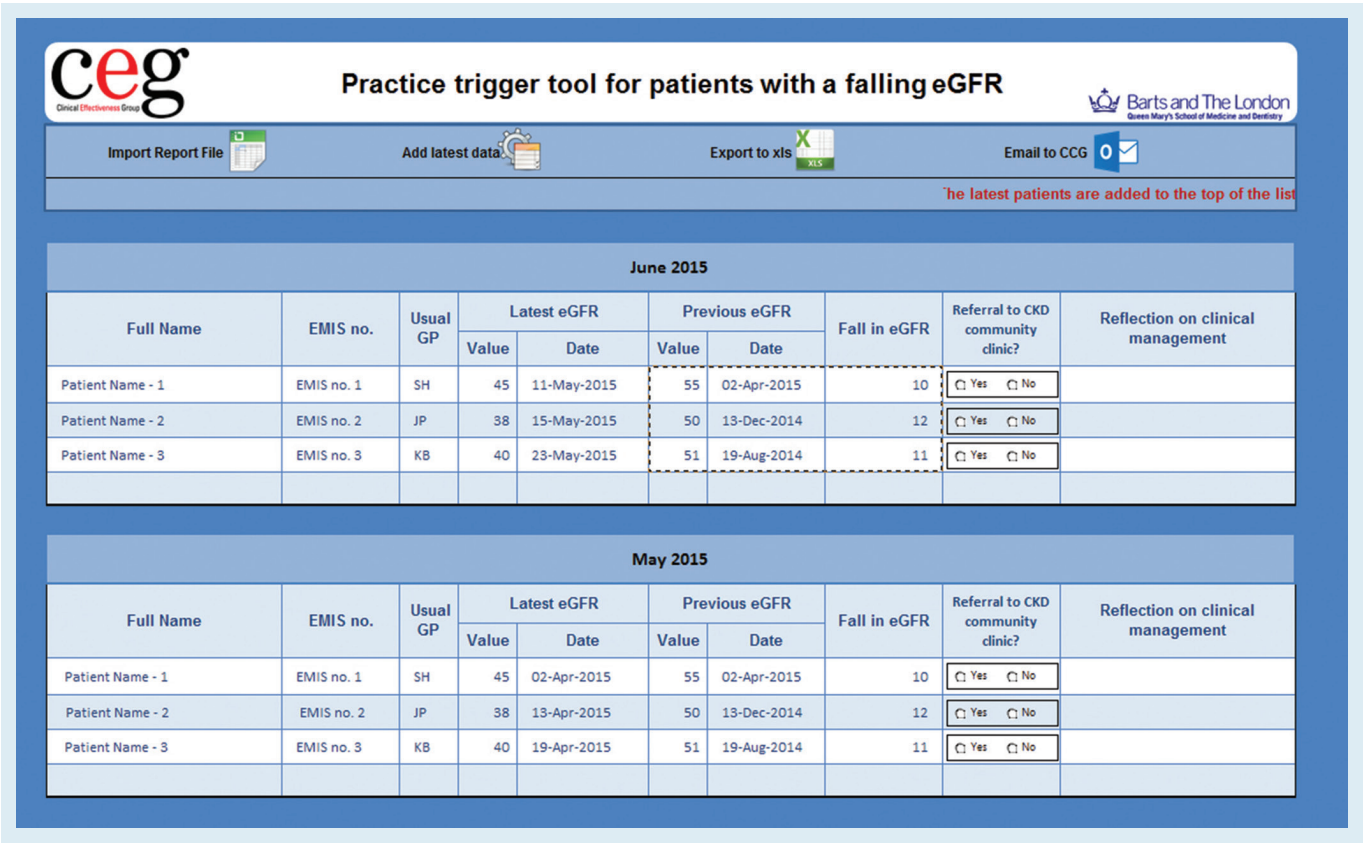

Figure 1. The falling eGFR trigger tool practice interface. The final column, 'Reflection on clinical management', invites clinicians to enter free text.

saturation was reached. Interviews with a practice manager and pharmacist were included to explore alternative staff views. All interviews were conducted face-to-face in the participant's practice using the structure–process–outcome framework as an interview guide.[16] Interview questions are available from the authors on request. Interviews were digitally recorded with participants' consent and transcribed verbatim.

A framework analysis approach was adopted, whereby a descriptive or conceptual label is assigned to excerpts of raw data (coding).[17,18] Two members of the research team independently coded the text to ensure trustworthiness of the data,[18] then worked together to group the codes into clearly defined categories, which subsequently became the analytic framework.[17]

Reflection data

Reflective comments over a 2-year period, January 2016 to December 2017, were extracted from the trigger tools. Comments were categorised by age of the patient as 'younger' (aged ≤60 years) and 'older' (aged ≥80 years), based on existing preconceptions about the data. These age bands were chosen because progressive CKD in patients who were younger may have more serious outcomes, and may be less well recognised in primary care.[19]

A qualitative description (QD) approach to analysis was adopted. This allows for low-inference descriptions of the data suitable for reflective comments, which were often very brief.[20,21]

The QD method included an iterative process of reading the comments to identify themes, until a saturation point was reached. There was generally one theme per entry, and sometimes a theme was not ascribed owing to the brevity of the comment; see Table 1 for examples of reflective data. This analysis lends itself to Sandelowski's approach to QD,[22] in which arrangement of the data should reflect the research aim. In this case a key aim was to characterise the variation in use of the trigger tool between younger and older groups. Two other members of the research team reviewed the themes to enhance rigour.[23]

Comparison of reflection and interview data

Comparing themes from both the datasets enabled the authors to compare GP perceptions of the tool with actions documented in the trigger tool. The themes from the transcripts, on occasion, were

Table 1. Examples of reflective data extracted from the falling eGFR trigger tool

Age group	Age, years	Latest eGFR, mL/min/1.73 m²	Previous eGFR, mL/min/1.73 m²	Referred?	Reflection comment	Theme
Patients who were younger	60	59	75	Yes	*'He has been referred to the community CKD clinic. His BP is well controlled on medications'*	Control of risk factors
	46	59	100	Yes	*'Immediate repeat has been request but will refer for safety'*	Refer for safety
	51	47	79	No	*'Fit healthy relatively young pt,? Why had low eGFR on one occ, repeat is normal'*	No obvious cause
	57	53	73	No	*'DM — good control, good BP on ACEi — plan is to rpt GFR end June check trajectory'*	Plan in place
Patients who were older	81	55	71	No	*'Did not take into account ethnic origin — recalculated to 65'*	No ethnicity adjustment
	87	52	71	No	*'rpt due'*	Repeat
	86	52	73	No	*'pt is palliative care, bloods were done routinely by comm matron but not clinically indicated and therefore decision was made not for further action — end stage dementia'*	End of life
	85	54	75	Yes	*'Will refer/drop unaccounted for'*	Drop unaccounted for
	84	55	73	Yes	*'eGFR gone down despite well controlled diabetes and BP. Patient is now 84 years old, should we be doing more?'*	Advice sought

ACEi = angiotensin-converting enzyme inhibitor. BP = blood pressure. CKD = chronic kidney disease. DM = diabetes mellitus. eGFR = estimated glomerular filtration rate. GFR = glomerular filtration rate. occ = occasion. pt = patient. rpt = repeat.

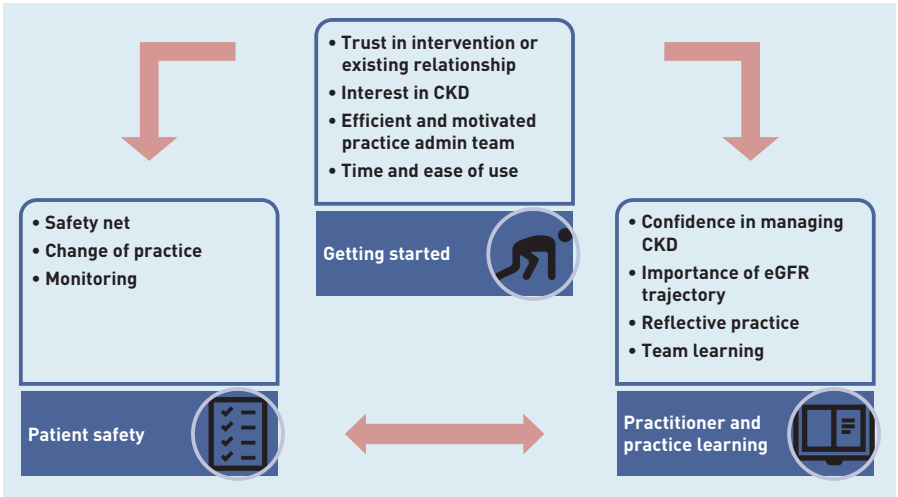

Figure 2. Analytical framework of interview themes and subthemes. CKD = chronic kidney disease. eGFR = estimated glomerular filtration rate.

challenged by the themes that emerged from the reflective comments.

RESULTS

Interview data

The purposive sample of eight practitioners included six GPs, one pharmacist, and one practice manager. Including the views of a range of staff was important as processes for running the trigger tools varied across practices.

Figure 2 shows the analytic framework[17] of themes and subthemes. The following three themes emerged: getting started; trigger tool for safety; trigger tool for learning.

Getting started. First, the existing trust and working relationship with the CEG[11] was seen to be important in getting started with trigger tool implementation.

One GP stated the reason for installing the trigger tool was because of the value that previous CEG interventions had brought:

'So, I'm more likely to try things out actually because I know there will be some value or some use to it. It's not going to be just an aimless box-ticking exercise, there is a point to it.' (GP)

The analysis highlighted key practice elements needed to gain maximum benefit from using the trigger tool.

Good practice organisation, a strong core administrative team, and an existing safety culture were all cited as reasons for getting started:

'... it works because we've got a great administrator called [name]*, and she just owns the process ... I think it's actually, what appealed to* [name] *is that she was quite compelled by the safety element of it ...'* (GP)

A further driver for implementation and sustainability was the short time it took to review each patient, with one GP saying that the whole process was streamlined and took just 2 to 3 minutes per patient. Another said of current systems:

'... it [can] *involve me writing a form, picking up the phone, sending a message, it's just it takes time ... if you can be of free of the administrative stuff I'll make better clinical decisions ...'* (GP)

One interviewee alluded to barriers affecting the use of the trigger tool, with uncertainty on whether a patient's eGFR had been adjusted for black ethnicity correction.

Trigger tool for patient safety. Many interviewees cited the importance of the trigger tool acting as a safety net, even though practice systems (such as EMIS Web) have the capability to run graphs of kidney function over time to identify progressive kidney disease:

'We look at this tool so if there are patients who are likely to decline there is a safety net.' (GP)

'I mean clinical governance wise it's, it feels safe, I'm looking for clinical safety and this gives us clinical safety in this little, particular area.' (GP)

A change of practice, such as prompting the clinician to undertake a medication review, was evident, with the pharmacist saying that patients were called up for repeat blood tests following review of the trigger, amendments to medications such as metformin, as well as checking that the patient is coded for CKD.

Another important issue raised was a possible change to proactive patient management rather than relying on reactive care. The trigger tool had prompted this interviewee to:

'... let's go and have a look at your notes and see what's happening. That's really different to how we practise, which tends to be quite on the back foot, so you're reacting to something all the time. And actually, to do something proactive and really use the record ...' (GP)

Trigger tool for learning (practitioner and practice learning). Practice staff reflected on an improved degree of confidence in managing CKD:

'About the importance of a healthy kidney and how to do it. And that, I think that was, for me that was the greatest learning experience really and it's like it's diabetes and blood pressure and medication and when we need to refer.' (GP)

Some felt more at ease in referring or requesting tests:

'Absolutely. So, I think I'm a lot more confident in requesting things in terms of investigations now.' (GP)

Some GPs recognised the change in practice as a result of using the tool, with more attention to the patients' eGFR trajectory:

'... they're not looking at eGFR as an isolated thing anymore, they're very much, when you look at your blood test results you're just looking at trajectories all the time.' (GP)

Some interviewees cited the usefulness of the trigger tool to reflect on clinical practice:

'... if there was anything, so for example that was prescribed that could have caused it? Or whether there was any intercurrent illness?' (Pharmacist)

The impact of the trigger tool on practice team learning was also evident with interviewees describing ways in which colleagues had acted on recommendations from the CKD lead clinician:

'So I think this is, this made, I think a big difference for us ... if you send a clinician a practice note to remind them of a drop in the eGFR, then to see a few weeks later that they actually had acted upon it ...' (GP)

The impact on working relationships and shared patient care were evident if the patients highlighted by the trigger tools were then discussed in a practice team meeting:

'So I think that's a great benefit because you end up talking about it in the clinical meetings and I think, I think it's stirred up or created greater awareness, I think, amongst us.' (GP)

Trigger tool reflective data

Reflective data were collated from 3400 completed trigger tools from two CCGs over a 2-year period (January 2016 to December 2017). Generally, these free-text data varied

from being very brief to quite detailed, with the latter providing more potential for identifying emerging themes. In a random sample of 1000 records from 79 practices, 92% of reflections were completed, 64% resulted in actions, and 10% resulted in referrals to the virtual CKD secondary care clinic. Table 2 shows the subset of 1921 free-text data extracts categorised by age group and referral status, and stratified by whether the drop in eGFR was >10, >15, or >25 mL/min/1.73 m^2.

Categorisation of the reflection data, by age and referral, enabled the observation of potential variations in clinical management of patients, including the comparison of patients who were younger versus patients who were older.

Both age groups had a referral rate of 8% overall (n = 91 for patients who were younger; n = 70 for patients who were older). Over 50% of all cases in this dataset of younger and older cases had a fall exceeding 15 mL/min/1.73 m^2; however, even with eGFR drops of >15 and >25 mL/min/1.73 m^2 the referral rates remained similar. Referral rates were also similar between the age groupings regardless of the size of fall in eGFR. In the younger-referred group, reflection data described cases where referral was undertaken for safety:

'Immediate repeat has been requested but will refer for safety.'

'SLE nephritis [lupus erythematosus], *need to keep renal informed, may just be normal fluctuation, recent MI* [myocardial infarction].*'*

In this group, the most common reflections were about the need for blood pressure and blood sugar control (10/81 cases (data not shown).

In the younger not-referred group there was an emphasis on repeat tests and monitoring; this was often presented as a reason for deferring a decision to refer. Some data describe improvements in eGFR on retesting, suggesting unknown, but transient, reasons for the drop in eGFR:

'Under review, may refer at later stage if persistent problem.'

'Repeat blood test showed improvement in renal function.'

In this group, the most common reflections were about control of risk factors, and the fall in eGFR being the first ever drop, with expectation of recovery. The older-referred group highlighted the complexity of managing patients with multimorbidity:

'Recent significant drop, in line with other health deterioration ... advice has been sought from nephrologists to help with further decisions.'

'Fluctuating eGFR on downward trajectory, likely related to age and diabetes and diuretics being used for CCF [congestive heart failure].*'*

The most common reflections in this group concerned age-appropriate eGFR decline (7/70 cases (data not shown). The older not-referred group, in common with

Table 2. Summary of management actions and referrals recorded in free-text case reflections over 2 years in 79 practices categorised by patient age and stratified by drop in eGFR, *N* = 1921

Action	Patients who were younger (≤60 years), *n* (%)	Patients who were older (≥80 years), *n* (%)
eGFR drop >10 mL/min/1.73 m^2		
All cases	1016 (100)	905 (100)
Referred[a]	91 (8.9)	70 (7.7)
Action includes review, retest, medication review[a]	696 (68.5)	587 (64.8)
eGFR drop >15 mL/min/1.73 m^2		
All cases	542 (53.3)	362 (40.0)
Referred[b]	35 (6.5)	27 (7.5)
eGFR drop >25 mL/min/1.73 m^2		
All cases	173 (17.0)	91 (10.1)
Referred[c]	11 (6.4)	3 (3.3)

[a]Percentage shown is out of cases eGFR drop >10 mL/min/1.73 m^2. [b]Percentage shown is out of cases eGFR drop >15 mL/min/1.73 m^2. [c]Percentage shown is out of cases eGFR drop >25 mL/min/1.73 m^2. eGFR = estimated glomerular filtration rate.

the younger group, had an emphasis on repeat tests and monitoring:

'Patient elderly and eGFR repeated and rose again to 66. BP diastolic readings are low, so perfusion may be low. Will repeat again in 1/12 and if remains low then will refer.'

Other reflections recorded a review of the eGFR trajectory over time:

'Fluctuating eGFR — current value same as 2011. Over 5 years has been as low as 41 and 63 highest value. Referral unlikely helpful at this stage — decision for continued monitoring.'

These recorded actions reflected some of the themes from the interviews, in particular the subthemes of monitoring in the not-referred groups and the trigger tool as safety net in the referred groups.

DISCUSSION

Summary

Evidence from the interviews indicated that, overall, practices welcomed the falling eGFR trigger tool. For most practices it was rapidly embedded into workflow with resulting sustainability. Over the 3 years of the project >90% of the tools had a free-text comment. This is in contrast with other quality improvement interventions that often report challenges in sustaining longer-term change.[24] This study also identified the importance of practice organisation and motivated administrative support to enable rapid uptake, and of trust in the clinical value of the intervention.

The present study utilised two types of data: practitioner perspectives, and practitioner actions/reflections on the trigger tool, which has enabled a richer understanding of how the trigger tools are used in practice. Reflection data highlighted cases of poorly controlled diabetes/hypertension for the young-referred group, while many referrals for patients who were older reflected gaining specialist support for a known plan. Generally, the not-referred groups showed that GPs had implemented a clinical management plan involving repeat tests and monitoring.

The free-text data stratified by age demonstrated similar referral rates, suggesting an equal distribution of concern for patients who were younger or older.

This study has shown that a falling eGFR trigger tool can be used effectively across unselected practices in an inner urban area. The tool was seen as easy to use, and supported the patient safety initiative, as well as promoting individual and team learning about CKD. Such tools are an effective use of data within the electronic health record and have applications in other domains of practice.

Strengths and limitations

A strength of this project was that the tools were used in all practices across three East London CCGs without any selection. The interviews included administrative staff as well as GPs, which provided a balanced view of how the tools were used in practices.

The large number of free-text reflections allowed the authors to gain a real impression of how patients were managed. The reflection data provided additional evidence to support the 'trigger tool as a learning tool' and 'patient safety' themes derived from the interviews. The reflections, stratified by age, challenged the research group's preconception that patients who were younger would be referred more frequently than patients who were older, in view of their greater risk of CKD progression.[19] The free-text reflection data from the trigger tools was anonymised, therefore it was not possible to track the impact of the trigger tools on rates of referral to the renal department, nor was it possible to examine individual clinical outcomes.

The trigger tool innovation was set within a broader change to the delivery of renal services in East London, which included support from commissioning organisations and the local CEG. Without this integrated approach to kidney disease and IT support for practices, uptake and use of the tools may well be less complete.

Comparison with existing literature

Few studies have examined the use of e-alerts based on routine primary care records to detect progressive kidney disease. The most comparable work is that of Kennedy *et al*,[25] which describes a population surveillance system using laboratory data to enable early detection of patients at high risk of progressive CKD, with eGFR-graph review carried out by laboratory staff. This intervention has seen evidence of spread and sustainability since 2010,[26] with 12 sites running the intervention for >1 year, eight for >2 years, and two sites running for >3 years. A study by Holmes *et al* on the use of an e-alert for acute kidney injury (AKI) in Welsh primary care[27] suggests that outcomes were better for patients with AKI identified in primary care settings if the alert resulted in a repeated measure of kidney function within the next 7 days.

Jeffries *et al* explored the implementation of a 'socio-technological' intervention, in the form of an electronic medicines optimisation system (EMOS) run by a CCG.[28] Their study, like the present study, acknowledged that practices need a strong core administration to adopt such safety tools. Their finding that practice engagement was compromised by concerns about access to data and perceptions of ownership of the system relate to the importance of local context described in the present study. Developing the trust required for busy practices to engage with an innovation and allowing data sharing requires QI organisations to be embedded in the infrastructure of local practice. Sustaining a quality-improvement intervention is often a challenge for health services. Convincing clinicians and managers that there is a problem, and getting data collection and monitoring systems right, are critical to success.[29] The trigger tool appears to be well received by GPs because current systems do not alert practitioners to falling eGFR trajectories, and the tool is quick and easy to use. As one interviewee commented, *'... you've got to make the right thing easy to do'* (GP).

Implications for practice

Practice use of the falling eGFR trigger tool supports the patient safety agenda as the tool highlights the trajectories of kidney function rather than the latest result, which is often viewed in isolation.[25] In addition, the study identified much 'hidden care' undertaken by GPs, which may have an impact on CKD progression. This is in contrast to reports of *'... tensions around the management of people with CKD'*, and uncertainty around the benefits of disclosure of a CKD diagnosis,[30] which suggest there is continuing ambivalence in the identification and management of people with early CKD.

Trigger tools have additional benefits beyond safety. Themes from the interviews identified practice team learning, including upskilling of clinicians in CKD management, examples of reflective practice, and promotion of team working. Another UK study suggested that trigger tools can enable care teams to refocus their learning and improvement efforts,[31] while a previous study in East London found that trigger tools engaged clinicians in ongoing reflective work around clinical safety.[13]

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Ethical approval

Ethical approval was not required for this service evaluation. All patient-level data are anonymised. All GPs in the participating East London practices consented to the use of their anonymised patient data for research and development for patient benefit.

Provenance

Freely submitted; externally peer reviewed.

Competing interests

The authors have declared no competing interests.

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REFERENCES

1. Nitsch D, Caplin B, Hull SA, *et al. National chronic kidney disease audit. National report (part 1).* 2017. https://www.lshtm.ac.uk/files/ckd_audit_report.pdf (accessed 19 Aug 2019).
2. Iwagami M, Tomlinson LA, Mansfield KE, *et al.* Validity of estimated prevalence of decreased kidney function and renal replacement therapy from primary care electronic health records compared with national survey and registry data in the United Kingdom. *Nephrol Dial Transplant* 2017; **32(Suppl 2):** ii142–ii150.
3. National Institute for Health and Care Excellence. *Chronic kidney disease in adults: assessment and management. CG182.* 2014. https://www.nice.org.uk/guidance/cg182 (accessed 19 Aug 2019).
4. Kim LG, Cleary F, Wheeler DC, *et al.* How do primary care doctors in England and Wales code and manage people with chronic kidney disease? Results from the National Chronic Kidney Disease Audit. *Nephrol Dial Transplant* 2018; **33(8):** 1373–1379.
5. Crinson I, Gallagher H, Thomas N, de Lusignan S. How ready is general practice to improve quality in chronic kidney disease? A diagnostic analysis. *Br J Gen Pract* 2010; DOI: https://doi.org/10.3399/bjgp10X502100.
6. Cleary F, Kim L, Caplin B, *et al. National chronic kidney disease audit. National report (part 2).* 2017. https://www.lshtm.ac.uk/media/9951 (accessed 19 Aug 2019).
7. Friedman CP, Wong AK, Blumenthal D. Achieving a nationwide learning health system. *Sci Transl Med* 2010; **2(57):** 57cm29.
8. Byrne C, Caskey F, Castledine C, *et al. 20th annual report of the Renal Association. UK renal registry.* 2018. https://www.renalreg.org/wp-content/uploads/2018/06/20th-Annual-Report_web_book.pdf (accessed 19 Aug 2019).
9. Hull S, Chowdhury T, Mathur R, Robson J. Improving outcomes for type 2 diabetic patients using general practice networks: a quality improvement project in East London. *BMJ Qual Saf* 2013; **23(2):** 171–176.
10. Robson J, Dostal I, Mathur R, *et al.* Improving anticoagulation in atrial fibrillation: observational study in three primary care trusts. *Br J Gen Pract* 2014; DOI: https://doi.org/10.3399/bjgp14X679705.
11. Queen Mary University of London. Clinical effectiveness group: renal health service. The Community Renal Service. A community renal service to connect patients, GPs and consultants for better care of chronic kidney disease (CKD). https://www.qmul.ac.uk/blizard/ceg/renal-health-service/ (accessed 19 Aug 2019).
12. Thomas N, Rainey H. Innovating and evaluating education for people with kidney disease. *Journal of Kidney Care* 2018; **3(2):** 114–119.
13. Margham T, Symes N, Hull SA. Using the electronic health record to build a culture of practice safety: evaluating the implementation of trigger tools in one general practice. *Br J Gen Pract* 2018; DOI: https://doi.org/10.3399/bjgp18X695489.
14. Griffin FA, Resar R. Institute for Healthcare Improvement. *IHI global trigger tool for measuring adverse events.* 2nd edn. Cambridge, MA: IHI, 2009.
15. de Wet C, Bowie P. The preliminary development and testing of a global trigger tool to detect error and patient harm in primary-care records. *Postgrad Med J* 2009; **85(1002):** 176–180.
16. Donabedian A. The quality of care. How can it be assessed? *JAMA* 1988; **260(12):** 1743–1748.
17. Gale NK, Heath G, Cameron E, *et al.* Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 2013; **13:** 117.
18. Noble H, Smith J. Issues of validity and reliability in qualitative research. *Evid Based Nurs* 2015; **18(2):** 34–35.
19. Mathur R, Dreyer G, Yaqoob MM, Hull SA. Ethnic differences in the progression of chronic kidney disease and risk of death in a UK diabetic population: an observational cohort study. *BMJ Open* 2018; **8(3):** e020145.
20. Dambha-Miller H, Silarova B, Irving G, *et al.* Patients' views on interactions with practitioners for type 2 diabetes: a longitudinal qualitative study in primary care over 10 years. *Br J Gen Pract* 2018; DOI: https://doi.org/10.3399/bjgp17X693917.
21. Neergaard MA, Olesen F, Andersen RS, Sondergaard J. Qualitative description — the poor cousin of health research? *BMC Med Res Methodol* 2009; **9:** 52.
22. Sandelowski M. Whatever happened to qualitative description? *Res Nurs Health* 2000; **23(4):** 334–340.
23. Mays N, Pope C. Rigour and qualitative research. *BMJ* 1995; **311(6997):** 109–112.
24. Martin GP, Weaver S, Currie G, *et al.* Innovation sustainability in challenging health-care contexts: embedding clinically led change in routine practice. *Health Serv Manage Res* 2012; **25(4):** 190–199.
25. Kennedy DM, Chatha K, Rayner HC. Laboratory database population surveillance to improve detection of progressive chronic kidney disease. *J Ren Care* 2013; **39(Suppl 2):** 23–29.
26. Gallagher H, Methven S, Casula A, *et al.* A programme to spread eGFR graph surveillance for the early identification, support and treatment of people with progressive chronic kidney disease (ASSIST-CKD): protocol for the stepped wedge implementation and evaluation of an intervention to reduce late presentation for renal replacement therapy. *BMC Nephrol* 2017; **18(1):** 131.
27. Holmes J, Allen N, Roberts G, *et al.* Acute kidney injury electronic alerts in primary care — findings from a large population cohort. *QJM* 2017; **110(9):** 577–582.
28. Jeffries M, Phipps DL, Howard RL, *et al.* Understanding the implementation and adoption of a technological intervention to improve medication safety in primary care: a realist evaluation. *BMC Health Serv Res* 2017; **17(1):** 196.
29. Crisp H. Overcoming challenges in improvement work. *J Ren Care* 2013; **39(Suppl 2):** 30–34.
30. Simmonds R, Evans J, Feder G, *et al.* Understanding tensions and identifying clinician agreement on improvements to early-stage chronic kidney disease monitoring in primary care: a qualitative study. *BMJ Open* 2016; **6(3):** e010337.
31. de Wet C, Bowie P. Screening electronic patient records to detect preventable harm: a trigger tool for primary care. *Qual Prim Care* 2011; **19(2):** 115–125.