

Lessons from Discover-NOW programme: Transforming chronic kidney disease care in North West London

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ABSTRACT

Chronic kidney disease (CKD) is a rising global public health emergency. Singapore faces one of the world's highest CKD prevalence rates at 15.6%, projected to reach 25% by 2035. This is driven by an ageing population and increasing rates of diabetes, hypertension, and obesity. The UK faces similar pressures, with CKD affecting over 10% of its population and costing the National Health Service an estimated GBP7 billion annually.

To address this, the Discover-NOW programme in North West London developed a transformative project, bringing together partners across both primary and secondary care. This project aims to identify barriers that prevent optimal management for those at risk of or already living with CKD, and to co-develop solutions to overcome them.

Priorities identified were to improve the identification and screening of patients with CKD, support accurate coding and documentation of CKD in primary care, enhance patient understanding and self-management of kidney disease, and promote treatment optimisation of CKD patients within primary care. Key innovations included electronic searches to identify undiagnosed, uncoded, and unoptimised CKD; integration of automated diagnostic guidance into laboratory results; creation of educational materials; and embedding decision-support templates aligned with the latest evidence-based guidelines into electronic medical records.

This initiative provides transferable insights into how healthcare systems across the world can integrate early CKD detection, system-wide data integration, and population-level prevention strategies to strengthen the capacity of primary care in the management of early CKD, eventually shifting from a reactive dialysis-centric model towards proactive kidney preservation.

Keywords: CKD screening, early detection of CKD, family medicine, nephrology, optimisation of therapy in CKD

INTRODUCTION

Chronic kidney disease (CKD) is a global public health emergency, resulting in significant health and economic burden. In Singapore, the prevalence of CKD is 15.6%, above the global prevalence

of 9.1%, and is projected to rise to a staggering 25% by 2035.¹ This is driven by Singapore's ageing population and the high prevalence rate of risk factors, such as diabetes, obesity, and hypertension. As CKD progresses, patients will require kidney replacement therapy in the form of dialysis or kidney transplant. Based on data from the Singapore Renal Registry, 6 new patients are diagnosed with end-stage kidney disease (ESKD) daily.² This amounts to 2249 new dialysis patients per year, representing an increase in incidence of kidney failure of 56% between 2011 and 2021. This places tremendous pressure on healthcare resources, imposes greater demands for new dialysis centres, and impacts enormously on the quality of life of the affected individuals.

However, this epidemic is not a problem unique to Singapore. In the UK, there are approximately 7.2 million people living with CKD equivalent to more than 10% of the entire population. The total annual economic burden of kidney disease in the UK is GBP7 billion, half of which is contributed to by the cost of ESKD treatment alone. This figure also accounts for the additional GBP372 million in productivity loss for people living with ESKD and those who support them, in addition to GBP225 million in transport costs for patients receiving dialysis.³

Preserving, instead of replacing kidney function

Traditionally, both in Singapore and in the UK, the approach to CKD management has been secondary care-based, with interventions often only being implemented when significant damage has already occurred. This trend is also evident in many other long-term conditions where management is often reactive rather than proactive. Patients with kidney disease are often reviewed in secondary care when CKD is advanced, if CKD is rapidly progressing, and when immune-mediated glomerulonephritis or genetic cause of CKD is suspected.⁴ While such thresholds are intended to ensure efficient use of specialist resources, they may inadvertently shift the emphasis away from earlier identification and proactive risk stratification.⁵

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Consequently, individuals with early kidney disease, such as those with preserved estimated glomerular filtration rate (eGFR) but with persistent albuminuria, are frequently overlooked.⁵ This results in missed opportunities for early therapeutic intervention, including optimised blood pressure control, glycaemic management, renin-angiotensin-aldosterone system (RAAS) blockade, and use of sodium-glucose cotransporter-2 inhibitors (SGLT-2i), all of which have been shown to slow CKD progression. Albuminuria has long been recognised as an independent risk factor for cardiovascular disease (CVD) and all-cause mortality.⁶ Therefore, the prevailing secondary-care-centred model contributes not only to sub-optimal patient outcomes but also to increased healthcare costs associated with the management of CVD and ESKD. To change this trajectory, there is a pressing need to shift from replacing to preserving kidney function. Strengthening the capacity of primary care to identify and optimally manage CKD early is critical to slowing disease progression and improving population health outcomes.

The North West London Discover-NOW experience

North West London (NWL) has one of the highest incidence of ESKD in the UK.⁷ CKD poses significant challenges in NWL due to high levels of social deprivation, ethnically diverse populations, and variations in clinical practice. To address these challenges, this transformational project brought together partners across both primary and secondary care, working collectively to identify barriers that prevent optimal

management for those at risk of or already living with CKD, and to co-develop and test solutions. The project was funded by the National Health Service National Prioritisation Programme and ran between April 2021 and April 2023. This partnership also included people with lived experience of CKD and experts in patient and public involvement and engagement, and in health inequalities and public health from the NWL Applied Research Collaboration. The project management was supported by Imperial College Healthcare Partners (ICHP) and included support from AstraZeneca via their non-promotional partnership with ICHP.

The project had 4 phases: discovery, co-design, testing, and implementation, as shown in Table 1. The following section describes the identified solutions in more detail.

Patient identification

One of the issues highlighted was that primary care clinicians have difficulties identifying patients at risk or with CKD who have been missed and require review. Electronic automated searches were developed in EMIS and SystmOne, the 2 electronic primary care electronic medical record (EMR) systems utilised across NWL that identify patients who require review and categorised them into 4 cohorts: (1) patients with test results indicating CKD who might need further tests and/or coding; (2) patients who fall within NICE recommendations for CKD screening who have not been screened; (3) patients on the CKD register who have not been reviewed; and (4) those with coded CKD whose care has not been optimised. Primary

Table 1. Phases of the Discover-NOW project.

Phase	Description
Discovery	Semi-structured interviews were conducted with individuals at risk of developing chronic kidney disease (CKD), patients with CKD, general practitioners, nephrologists, pharmacists, and nurse to: • map the current CKD pathways • identify challenges preventing early-stage CKD management • prioritise which challenges to solve
Co-design	Workshops were held to co-create solutions with patients and clinicians to solve the prioritised challenges from the discovery phase. Four key ideas were identified for further development into solutions: • A CKD diagnosis pathway with an education programme for patients • Enhancing primary care test results with CKD clinical advice and management guidelines • A risk stratification search and contact process that enables primary care to identify high-risk CKD patients • An improved annual review pathway for type 2 diabetes and hypertension patients to encourage identification and management of CKD Subsequently, effective solutions were developed to: • Improve the identification and screening of patients with CKD • Support accurate coding and documentation of CKD in primary care • Enhance patient understanding and self-management of CKD • Promote optimisation of treatment of CKD patients within primary care settings
Testing	Four patient workshops and weekly developmental sessions were organised with the clinical group to test and iterate the solutions developed.
Implementation	Solutions were rolled out to primary care.

care clinicians can then use a visualisation dashboard to track their progress against targets and prioritise patients for intervention (Fig. 1).

Screening

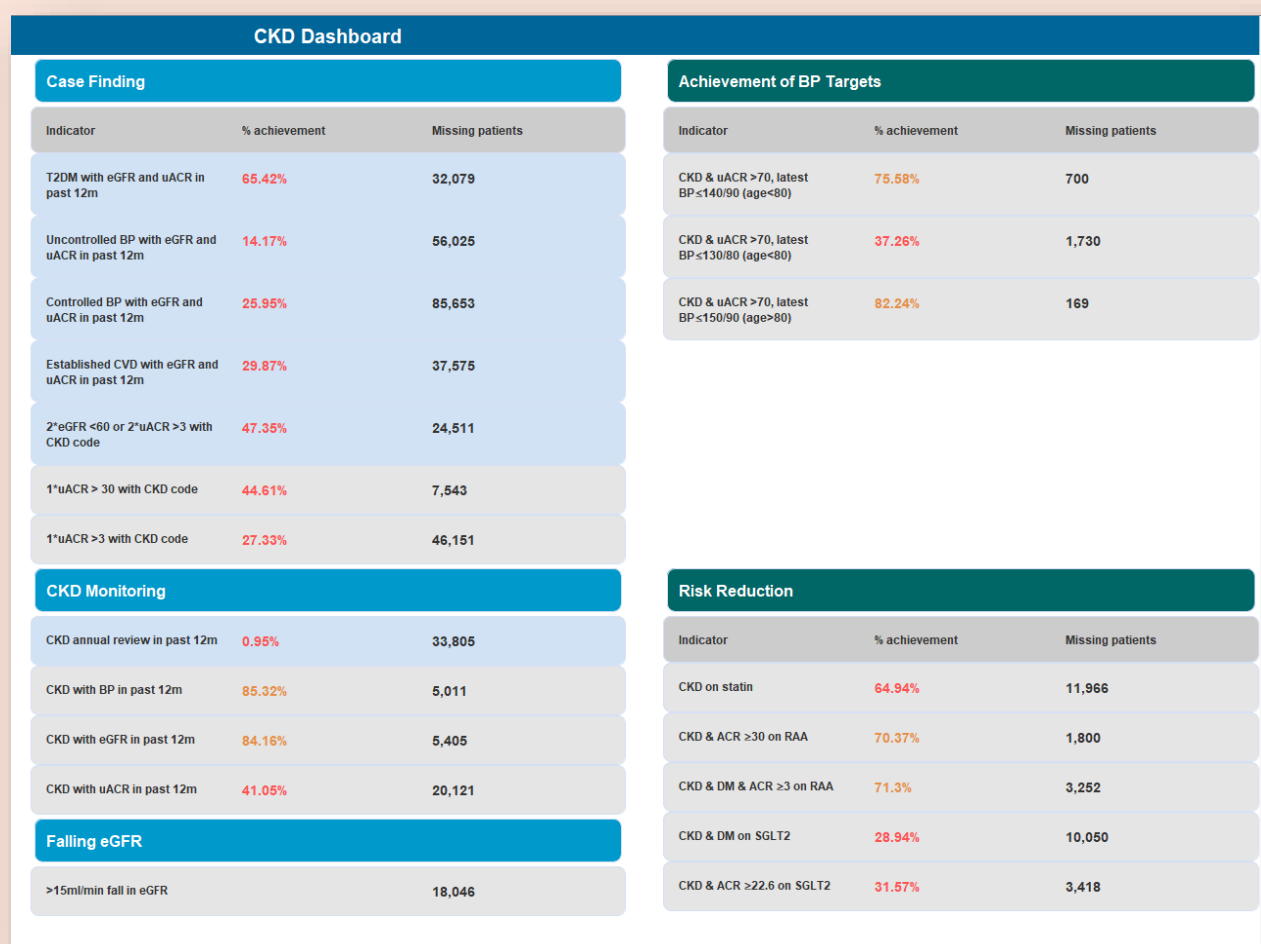
A significant challenge in the early detection of CKD is the silent nature, especially in its early stages. Although urine albumin-creatinine ratio (uACR) is a key indicator of early kidney damage, it is often not completed in practice, even when ordered, in contrast to serum creatinine. Insights from interviews revealed that patients were unaware of the links between diabetes, hypertension, and CKD; unclear about the purpose of uACR test; and their urine samples were not collected if they were not the first sample of the day. To address this, a leaflet explaining the purpose and importance of a uACR test in layman's terms was created. A video was made to support primary care practice staff to standardise the urine sample collection

process. The video emphasises a few points, namely, patients with hypertension require screening, not just those with diabetes; urine samples should be collected opportunistically from patients even if they are not first of the day; and how to select tests in EMR.

Coding and diagnosis

Many individuals at risk or with CKD are not identified, and their conditions are not consistently coded in primary care systems. Patients coded for CKD are associated with lower risk of acute kidney injury, unscheduled care, cardiovascular admissions, and death compared with those with uncoded CKD. These benefits stem from the downstream effects of clinical coding, such as automated prescribing alerts to avoid nephrotoxic medications, pharmacological recommendations according to albuminuria, monitoring frequency according to CKD stages, and vaccination reminders.⁸ Therefore, the team deve-

Fig. 1. CKD dashboard for primary care physicians to track their progress against targets and prioritise patients for intervention.



ACR: albumin-creatinine ratio; BP: blood pressure; CKD: chronic kidney disease; CVD: cardiovascular disease; DM: diabetes mellitus; eGFR: estimated glomerular filtration rate; RAA: renin-angiotensin-aldosterone inhibitor; SGLT: sodium-glucose cotransporter 2 inhibitor; T2DM: type 2 diabetes mellitus; uACR: urine albumin-creatinine ratio

loped automated coding guidance from pathology laboratories to be sent with eGFR and uACR results to primary care (Table 2). In addition, practices will see a status alert for patients who have had 2 eGFRs <60 ml/min/1.73 m² within 3 months and have not been coded for CKD or have an incorrect code.

Non-pharmacological treatment, including population health interventions and behaviour nudges to improve outcomes, remain a largely untapped opportunity in managing CKD. Patients who have been coded were signposted to different resources for

kidney education, namely, “Know Your Kidneys” virtual education session; YouTube videos on “Understanding CKD” in the commonest local languages such as English, Gujarati, and Polish; Kidney Care UK website; and access to peer support via National Kidney Federation helpline. These resources were available directly from the EMRs.

Optimisation

In the last decade, several new therapies have been added to the armamentarium to retard CKD

Table 2. Examples of automated coding guidance, provided alongside results.

Result	Comment
eGFR of 45–59 ml/min/1.73 m ²	If not acute kidney injury, consider coding for CKD stage G3a (requires 2 eGFRs taken 3 months apart and uACR). Consider appropriate CKD management, including RAASi, SGLT-2i, BP control, and review CVD risk factors.
uACR of 3–70 mg/mmol	If new, repeat morning sample uACR within 2 weeks. Consider coding for CKD and appropriate CKD management, including RAASi, SGLT-2i, BP control, and review CVD risk factors.

BP: blood pressure; CKD: chronic kidney disease; CVD: cardiovascular disease; eGFR: estimated glomerular filtration rate; RAASi: renin-angiotensinogen-aldosterone system inhibitor; SGLT-2i: sodium-glucose cotransporter-2 inhibitor; uACR: urine albumin-creatinine ratio

Fig. 2. EMIS CKD review and management template.

ACEi: angiotensin-converting enzyme inhibitor; ACR: albumin-creatinine ratio; ARB: angiotensin II receptor blocker; BP: blood pressure; CKD: chronic kidney disease; eGFR: estimated glomerular filtration rate; SGLT2i: sodium-glucose cotransporter-2 inhibitors; T2DM: type 2 diabetes mellitus; uACR: urine albumin-creatinine ratio

progression beyond RAAS inhibitors, including SGLT-2i and non-steroidal mineralocorticoid receptor antagonist finerenone. However, these evidenced-based therapies are not well integrated into care protocols or individual care plans, resulting in large gaps between guideline-recommended treatment and actual clinical practice. The Discover-NOW project developed integrated template proformas within the EMRs to support primary care clinicians to manage and optimise CKD patients according to the latest guidelines. Some features include coding table to confirm CKD staging and simplified optimisation guidelines to ensure patient has been recommended the latest therapy (Fig. 2). One of the optimisation guides was adopted from the London Kidney Network, an optimisation pathway for adults with CKD called “3 in 3”—3 key actions within 3 months to save lives.⁹ It provides guidance to initiate statin and RAAS blockade in the first month, SGLT-2i in the second month and thereafter initiate further BP lowering agents in the third month to achieve prespecified individualised BP targets.

Relevance to Singapore healthcare system

Internationally, there are other early CKD care models including Taiwan’s pay-for-performance programme, which incentivise longitudinal disease tracking, multi-disciplinary care, and patient education.¹⁰ North East London has pharmacists with specialist training support primary care pharmacists in medicine optimisation.¹¹ In Singapore, the HALT-CKD (Holistic Approach to Lowering and Tracking Chronic Kidney Disease) programme, which systematically recruits and tracks patients with risk factor control at the primary care level, is excellent as it focuses on registry-based monitoring once CKD has been identified.¹² However, to achieve a significant shift from treatment to prevention in Singapore, it is vital to focus attention upstream in the disease pathway and to utilise EMRs to identify undiagnosed, uncoded, and unoptimised CKD.

The Discover-Now initiative addresses this gap through system-level redesign, rather than isolated clinical interventions, to improve early identification and management of CKD at a population level. Primary and secondary care worked with input from those with lived experience, to consider what issues impede good practice in relation to CKD and how these impediments can be overcome. Integrating automated coding guidance into laboratory results and embedding decision-support templates aligned with latest evidence-based guidelines into EMRs help to reduce variation in practice and narrow the knowledge-implementation gap.

CONCLUSION

Discover-Now’s success was dependant on the systematic approach taken, strong primary-secondary care collaboration, sustained clinical engagement, and interoperable laboratory data. These factors may not be uniformly present across different healthcare systems. While the project demonstrated strong system-level engagement, translation into meaningful patient outcomes depends on sustained adherence and a high-quality therapeutic patient-clinician relationship. Nevertheless, this initiative provides transferable insights into how healthcare systems across the world can integrate early CKD detection, system-wide data integration, and population-level prevention strategies to shift from reactive dialysis-centric model towards proactive kidney preservation. In Singapore, leveraging the highly digitalised National Electronic Healthcare Records alongside the new Healthier SG CKD care protocol, which aims to shift the city-state away from hospital-centric care to a more population-centred preventive model, presents a timely and strategic opportunity to strengthen primary care’s role in mitigating the growing burden of kidney disease.¹³

Ethics statement

Not applicable, as no study participants were involved.

Declaration

The authors have no affiliations with or involvement in any organisation or entity with any financial interest in the subject matter or materials discussed in this manuscript. The Discover-NOW consortium secured GBP250,000 funding from the National Insights Prioritisation Programme to run a multidisciplinary project to understand the challenges in early CKD pathways, and co-design and test innovations that address these challenges to sustainably improve patient outcomes.

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