

# BMJ Open Quality NEPHwork: creating a quality improvement and research network for UK renal trainees

Kirsty Crowe,<sup>1</sup> Manuela Savino,<sup>2</sup> Jennifer Williams,<sup>3</sup> Muhammad Amaran,<sup>4</sup> Toby Humphrey,<sup>5</sup> James Medcalf,<sup>6</sup> NEPHwork consortium

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<sup>1</sup>Glasgow Renal and Transplant Unit, NHS Greater Glasgow and Clyde, Glasgow, UK

<sup>2</sup>Renal Service, Guy's and St Thomas' NHS Foundation Trust, London, UK

<sup>3</sup>College of Medicine and Health, University of Exeter, Exeter, UK

<sup>4</sup>Renal Unit, St George's Hospital, London, UK

<sup>5</sup>Department of Nephrology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK

<sup>6</sup>John Walls Renal Unit, University Hospitals of Leicester NHS Trust, Leicester, UK

## Correspondence to

Dr Kirsty Crowe;  
kirsty.crowe2@nhs.scot

## ABSTRACT

NEPHwork was established in 2020 as a renal specialty trainee-driven national quality improvement and research network with the aim of coupling the benefits of trainee-led collaboration with the rich data collection infrastructure established by the UK renal registry. NEPHwork was established to support the development, coordination and delivery of audit and research projects by renal trainees on a national scale. The first collaborative project centred on the compliance with care quality standards in managing acute kidney injury. The project enabled a large amount of data to be collected over a relatively short period of time and allowed comparison between renal units involved in contributing to the data. The initiation of the NEPHwork collaboration had to overcome delays and service pressure related to the COVID-19 pandemic. Furthermore, the method of linkage analysis used in the data collection and lack of cohesion with regional information technology (IT) services prevented trainees from certain regions from contributing to the project and this is a key priority for the next NEPHwork collaboration.

## INTRODUCTION

Quality improvement (QI) and clinical audit are key facets of the UK renal medicine trainee curriculum. Engagement in meaningful and sustainable QI activity can be limited due to variable regional academic support and the disruption of frequent clinical rotation. Trainee-led regional networks, first established in UK surgical specialties, have successfully harnessed the capability of large numbers of rotating trainees to improve the efficiency and power of data collection, and permit generalisability of results through multicentre studies.<sup>1</sup>

Disease-related registries are integral to audit and continuous QI. Globally, there are 79 kidney failure registries.<sup>2</sup> The UK renal registry (UKRR) has evolved since it was established in 1995, and now collects demographic and sequential data from all UK renal units on adult and paediatric patients with chronic kidney disease (CKD) stage 4 and 5, those who require kidney replacement therapy (KRT), and all recorded episodes of acute kidney injury (AKI) direct from pathology

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Engagement in quality improvement activity is an essential component of postgraduate training, and trainee-led collaborations have worked well on a national level in surgical specialties. The UK renal registry links together rich datasets which can be used to inform quality improvement and research activity.

## WHAT THIS STUDY ADDS

⇒ National engagement of renal trainees in quality improvement activity is possible using existing registry infrastructure although this does not necessarily overcome regional information technology (IT) difficulties.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This collaborative platform provides a method of linking a workforce willing to engage in quality improvement activity with rich registry patient datasets.

laboratories. Data from Scottish renal units are collected by the Scottish Renal Registry and feeds into the UKRR.

The data obtained through the UKRR provide a detailed intercentre comparison of attainment of established audit standards and outlines national and long-term trends. In recent years, the registry has gained permission to link data to Hospital Episode Statistics (HES) for audit purposes. In collaboration with KidneyCareUK, it conducts an annual patient experience survey, and it is hoped there will be future expansion of the data collection to include patient-reported outcomes. As a result of the data collected, the registry can support research projects by embedding their long-term follow-up within the registry data.

NEPHwork was established in 2020 as a renal specialty trainee-driven national QI and research network, and aims to couple the benefits of trainee-led collaboration with the rich data collection infrastructure established

by the UKRR. NEPHwork was established to support the development, coordination and delivery of audit and research projects by renal trainees nationally. The first collaborative project centred on the compliance with AKI care quality standards.

## METHODS

NEPHwork was conceived by renal trainees in discussions through an educational trainee network, the Renal SpR Club. A steering committee was formed of trainees and supporting consultant nephrologists with links to the UK Kidney Association (UKKA), Kidney Research UK (KRUK), UKRR and the specialist advisory committee. The objective of NEPHwork is to develop and manage projects that answer specific questions on a national scale by coordinating the activity of a large number of renal trainees. All trainees can submit their research and QI proposals for consideration to the steering committee through a transparent online application process. This initiative aims to offer trainees the opportunity to contribute to the development of better-quality standards of care, expand their curriculum and obtain formal credit for participation. NEPHwork has received financial support from UKKA and KRUK.

### Why was the AKI care project chosen?

The NEPHwork AKI care project was chosen as its first project as a comparison of care quality in the identification and management of AKI between NHS acute trusts over 10 years on from the 2009 National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report 'Acute Kidney Injury: Adding Insult to Injury'. In this report, approximately 1000 care episodes were reviewed in people who had died in England.<sup>3</sup> Only 50% of AKI care was considered good; there was poor assessment of AKI risk factors and an unacceptable delay in recognising post-admission AKI, of which a significant proportion was avoidable. Furthermore, AKI complications were often managed poorly. Since this report there have been various QI initiatives instigated including standardising reporting strategies, development of educational resources and laboratory alert systems.<sup>4</sup> The NEPHwork project aimed to determine the impact of these initiatives on AKI identification and management.

### Engaging renal trainees

The engagement of trainees was coordinated by the NEPHwork steering committee. The initiative was presented at regional and national UK renal meetings, and the Renal SpR Club network and UKKA mailing list were used for publicity. The committee also engaged with social media to promote the interaction of trainees with NEPHwork. Engagement of interested parties was coordinated centrally with the UKRR.

### Data collection

Data on the care processes and outcomes of hospitalised adult patients with AKI stages 2 and 3 were collected

across a sample of hospital trusts in England and Wales. Fifty-seven trainees in 24 NHS Trusts, 22 in England and 2 in Wales, registered the project locally using guidance produced by the steering committee, and a nominated consultant nephrologist oversaw local data collection. A data collection tool was developed by the steering committee against the UKKA's 2019 AKI clinical practice guideline.<sup>5</sup>

Data were collected between 1 December 2020 and 28 February 2021 in the form of a retrospective case note review of AKI stages 2 and 3 episodes in hospital between 1 December 2018 and 28 February 2019. A target of 1000 AKI episodes was selected, in line with the 2009 NCEPOD report. AKI care episodes in England were identified using the linkage between the UKRR AKI master patient index of AKI warning test scores and HES. In Wales, local hospital data were used to identify cases. A patient identifier for each episode was sent from the UKRR through a secure electronic portal that was accessible to participating trainees. Trainees reviewed patient records for the selected episodes and returned the data using the secure portal.

### Data analysis

Data were analysed by the UKRR following a prespecified statistical analysis plan developed in consultation with the UK Acute Kidney Injury Special Interest Group (SIG), a group open to all healthcare professionals with an interest in AKI. This group facilitates communication between multidisciplinary healthcare professionals to develop QI projects on AKI care for adults with hospital-acquired AKI and those requiring KRT.

## RESULTS

The analysis included 989 AKI care episodes. Twenty-four out of 73 UK NHS Trusts with a main renal unit were represented by the participating trainees. A detailed description of data analysis and conclusions is available from the NEPHwork AKI national audit report, released in Spring 2022.<sup>6</sup> To summarise, 10 years after the last national survey on the quality of care and outcomes of patients admitted to hospital with AKI, the NEPHwork project highlighted the persistence of significant variation between centres in achieving expected standards of care. Intrahospital mortality remained high at 31% for all AKI episodes. In addition, 30-day mortality was high, at 33% overall, and reached 35.4% in stage 3 AKI. The 90-day readmission rate among AKI survivors was high, reaching 40% for stage 3 AKI. Considering this readmission rate, it was noted that 20% of discharge summaries did not mention AKI. Although only 2.4% of the included AKI episodes required long-term KRT, this represents a significant burden for patients and services.

## DISCUSSION

NEPHwork provided a platform to deliver the first national collaboration among UK renal trainees. This enabled a

large data collection over a short period of time, covering multiple regions with varied socioeconomic statuses. The results generated informed the UKRR of the different processes and standards of care with regard to hospitalised AKI management and how these compare with the most recent National Institute for Health and Care Excellence and UKKA guidelines.

The data enables renal units to review and improve on their local practices. The network has enabled creative discussion between trainees and clinical units, and other interested stakeholders such as the UK Acute Kidney Injury SIG. This group has an interest in the promotion of shared decision making and support self-management post-AKI, and this audit data have highlighted potential gaps that can be addressed.

Despite these successes, there were limitations on the initiation of the NEPHwork collaboration. The COVID-19 pandemic delayed the launch of the AKI project and some units had to withdraw participation due to the service pressure imposed by the pandemic. This disproportionately affected District General Hospitals and certain geographical regions which likely skews some of the interpretation of the findings. The linkage analysis utilised for this project excluded trainees from renal units in Scotland and Northern Ireland contributing to the data collection, depriving the project of data from large parts of the UK and providing a barrier to these trainees in taking part in national QI activity. Overcoming regional differences in training and subsequent participation in research and meaningful QI activity is one of the NEPHwork aims, therefore these accessibility issues were disappointing. Overcoming the barrier of the lack of information technology (IT) standardisation across healthcare regions impacting on linkage analysis is a priority for the next NEPHwork collaboration.

Nonetheless the broad trainee participation in the project, as well as the subsequent publication of a report demonstrates that linking trainees nationally through an existing infrastructure such as the UKRR is possible, and trainees can contribute to the profession's clinical governance through such collaborations. It is expected that, with the successful completion of this project, NEPHwork will continue to carry out large-scale audit and QI projects, not only improving the data archive but also enriching clinical trials. We hope that this initiative will contribute to a continuous exchange of ideas and knowledge between UK renal units.

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