

Farr@Aberdeen Research Theme: Kidney Disease Research Programme
(leveraged funding)

Long Term Prognosis in Acute Kidney Injury – Establishing Prognosis to Design Optimal Management

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Acute kidney injury (AKI) is a serious condition complicating up to 1 in 7 hospital admissions. It is usually diagnosed from rapidly deteriorating blood tests. Much of the focus of clinical research has been on strategies to improve the recognition and timely intervention for people developing AKI, however there is a growing body of evidence that even when people survive AKI, they remain at an elevated risk of poor outcomes beyond the hospital episode.

The aim of this research programme was to determine which people with AKI have an ongoing increased risk of poor outcomes (mortality, kidney failure, recurrent illness episodes) after hospital discharge. The design was a population-based data-linkage cohort study involving the Grampian Laboratory Outcomes Morbidity and Mortality Study (GLOMMS-II). Data linkages included population biochemistry, hospital episode data, mortality records, intensive care records and renal registry data from 1999-2013. A cohort of 17,000 people hospitalised in 2003 were followed through to 2013. Outcomes were mortality, progression of kidney disease and unplanned hospital readmission episodes.

The key novel outputs from the study included a new adaptation of international AKI criteria for use in large population datasets, a clinical risk prediction model for unplanned readmissions hospital discharge (for which AKI was a strong and independent predictor), a detailed survival model showing for how long people with AKI remain at an increased risk of death (at least one year depending on the subgroup), and a model of renal progression after AKI providing new insight into how and when people experience long term declines in kidney function.

Together these findings reveal a serious condition with long lasting implications that warrants careful planning even after a person has recovered. The project has also inspired further work replicating analyses in different populations and clinical settings across the UK and North America.

Publications:

Sawhney, S., Marks, A., Fluck, N., Levin, A., McLernon, D., Prescott, G. & Black, C. (in press). 'Post-discharge kidney function and subsequent ten year renal progression risk among acute kidney injury survivors: a population cohort study'. *Kidney International*.

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Sawhney, S., Fluck, N., Fraser, SD., Marks, A., Prescott, GJ., Roderick, PJ. & Black, C. (2016). 'KDIGO-based acute kidney injury criteria operate differently in hospitals and the community—findings from a large population cohort'. *Nephrology Dialysis Transplantation*, vol 31, no. 6, pp. 922-929. DOI: [10.1093/NDT/GFW052](https://doi.org/10.1093/NDT/GFW052)

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Developing tools to predict risk in patients with chronic kidney disease

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Chronic kidney disease (CKD) affects nearly 10% of the population, yet there is uncertainty over how best to manage the condition. Researchers from University of Aberdeen developed a research platform that included the Grampian Laboratory Outcomes, Mortality and Morbidity Study (GLOMMS).

Its aim was to explore health outcomes among people with CKD in 2003 and to develop tools for identifying patients at risk of disease progression. The platform brought together six years' worth of data, including information from the Scottish Renal Registry, and laboratory and hospital admission data, on 70,000 people with abnormal and normal kidney function.

It showed that people with CKD have an increased risk of death and of needing renal replacement therapy (RRT) than people with normal kidney function. This led to the development of tools for identifying those patients who are most likely to need RRT, or to die, over a five-year period. Detecting such high-risk individuals will enable improvements in their quality of primary care.

To date these tools have been used in local clinics in Scotland, and on-going work is aimed at refining them for wider use.

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Collaboration across the Farr UK network:

<http://www.farrinstitute.org/research-education/research/understanding-chronic-disease/kidney-disease>