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**Key words describing the area of study:**

Acute renal failure, medical, surgical

**Simple description of the study proposal (maximum 200 words):**

Acute renal failure [ARF] is a severe, life-threatening complication of both elective and emergency surgery, as well as among those admitted to emergency medical units. There is 50% mortality among those who develop acute renal failure and require emergency dialysis treatment, and in the ICU setting mortality is 70%.

The National Service Framework for Renal Services identifies improved prevention and management of ARF as a quality requirement.

At least some peri-operative ARF is avoidable, and strategies to reduce the risk of ARF in both pre-operative and peri-operative care are well known; they include identifying those at high risk because of pre-existing chronic kidney disease, minimising exposure to potentially nephrotoxic drugs and contrast agents, and appropriate referral to specialist services. These strategies are equally relevant to the prevention and management of ARF in emergency medical units. But there is little information on the extent to which avoidable factors play a part in contemporary patients who develop ARF.

**Expected value of the results:**

This work on a national basis will provide unique data that will serve as the benchmark against which to compare implementation of best practice. Such best practice will be deliverable within current care pathways with improved education and training for relevant health professionals; the organisational costs of this will be modest, and the potential health gain, including cost avoidance for management of established ARF will be substantial.

**Statement of no overlap with any similar work:**

The Renal Association are working with the Scottish Audit of Mortality (SASM) to review aspects of renal failure. This only covers Scotland and would only complement the work by NCEPOD.

The Healthcare Commission are also proposing to do an audit of chronic renal failure which would not overlap with this proposal.

### **Background evidence supporting the proposal**

Acute renal failure can be defined as an acute rise in blood urea and serum creatinine levels due to a sudden decline in glomerular filtration rate. ARF can occur as an isolated problem, but it more commonly occurs secondary to a circulatory disturbance, for example, severe illness, sepsis, trauma or surgery. ARF is a life-threatening in patients undergoing both elective and emergency surgery, as well as those admitted to emergency medical units.

There is no universally accepted definition of ARF and it is, therefore, difficult to obtain accurate numbers and compare different studies. One of the largest studies in recent years, was a retrospective analysis of 41,972 patients admitted to 22 ICUs in UK and Germany between 1989 and 1998<sup>1</sup>. This study used the definitions of ARF proposed by Bellomo *et al*<sup>2</sup>. They found patients with acute renal injury (ARI), acute renal system failure syndrome (ARFS) and severe acute renal failure syndrome to have in-hospital mortality rates of 29.5%, 49.2% and 63.0% respectively; compared to 10.3% in patients without renal failure. A smaller 2002-03 UK-based study reported a one month mortality rate of 74% in patients who developed ARF in ICU<sup>3</sup>.

The number of finished consultant episodes (FCEs) in England for which ARF (ICD-10 code N17) is listed as the primary diagnosis has steadily increased over the last five financial years: rising from 10,085 FCEs in 2000-01 to 19,950 FCEs in 2004-05. Despite the rise in the number of FCEs over recent years, the number of patients with ARF as the primary cause of death has remained at approximately 470 deaths per annum.

At least some cases of both peri-operative and medical ARF are avoidable. Given the high mortality rate associated with ARF, it is important to identify those patients at risk; thereby allowing preventive measures to be commenced in a timely manner<sup>6</sup>. The National Service Framework for Renal Services emphasises the importance of pre-operative assessment and peri-operative management in the prevention of ARF and identifies prevention and management of ARF as a quality requirement<sup>7</sup>.

### **Key references**

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4. Hospital Episode Statistics. Table 3. Primary Diagnosis, NHS Hospitals, England. 2000-01 2001-02, 2002-03, 2003-04, 2004-05.
5. Office of National Statistics. Table 2.14 Series DH2. Underlying cause of death. 2002, 2003, 2004.
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7. The National Service Framework for Renal Services. Part Two: Chronic Kidney Disease, Acute Renal Failure and End of Life Care. Department of Health, 2005.