University of BRISTOL

Elizabeth Blackwell Institute for Health Research

Research for Health Scheme

Stage 1 - Call for Challenges Application Form - 27

- **This call is open to doctors, nurses and allied health professionals employed by the NHS.**
- **Please use this form to describe a specific issue or challenge, which you are currently facing in your area of healthcare delivery.**
- **The deadline for submission is 25 Feb 2014. Please email this application form to** Lisa.Wheatley@Bristol.ac.uk
- **If your challenge is selected, University of Bristol researchers have the opportunity to bid for funds to help them develop a solution. They will work in partnership with you to make sure the new technology; device or innovation will really work for you, your colleagues and your patients.**

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Challenge Title (max 20 Words)
Acute renal injury after major orthopaedic operations.

Please describe the specific problem which needs addressing

Acute kidney injury (AKI) in patients receiving preoperative Angiotensin Axis Blockers has been demonstrated after lung, vascular and cardiac surgery. However, there is a little literature evaluating the hypotensive and renal effects of preoperative angiotensin axis blockers and major orthopaedic surgeries. (1).

The development of acute kidney injury (AKI) during the perioperative period is associated with increases in morbidity and mortality. Our aim is to evaluate the incidence and determinants of postoperative AKI after major orthopaedic surgeries in patients with previously normal renal function. (2)

The National Joint Registry reports about 160,000 total hip and knee replacements preformed in England and Wales annually.

The overall incidence of kidney dysfunction (KD) after elective or emergency orthopaedic surgical procedures is reported to reach 9.1%. (3-7).
Patients that undergo major orthopaedic procedures are also at high risk for AKI due to the potential high volume of blood loss, severe electrolyte disturbances, the development of perioperative infection or sepsis and the presence of several comorbidities that may impair renal function (i.e. diabetes mellitus, heart failure, severe arrhythmias, pulmonary embolism etc.). (8).

In addition, pre- or post-operative KD is a risk factor for postoperative complications, including acute renal failure and cardiovascular disease, leading to increased morbidity and mortality (9-11)

Emersons Green Treatment Centre started to provide total knee and hip arthroplasties in 2009. As we have a constant drive to improve our processes in order to promote patients' safety and experience, our arthroplasty protocols were carefully tailored to achieve better results. With the introduction of Enhanced Recovery Protocol we managed to reduce the patients' hospitalization period significantly.

With our research initiative we would like to understand what the trigger factors are which are most likely to lead to AKI in our patient population. This would significantly reduce the risk of developing AKI and would lead to better outcomes for the patient.

References:

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How does this issue impact on you, your colleagues and your patients?

The problem of acute kidney injury is affecting not only the patients' life and recovery, but also the budget of the hospital as these patients usually stay on the word longer than expected. If there is an evidence based approach to prevent this complication from happening, we have a duty of care to understand the triggers & are eager to find it.

This would have an overall impact on all aspects of healthcare (patients' experience and safety, clinical excellence, finances etc.)

Can you estimate how many patients or staff are affected by this problem?
Can you describe any associated financial implications for the NHS or patients?
(Don't worry if you are not able to answer this question at this stage – it is not compulsory)

As detailed above there are about 160,000 arthroplasties performed in England and Wales annually. The overall incidence of kidney dysfunction (KD) after elective or emergency orthopaedic surgical procedures is reported to reach 9.1%. (3-7).

The reduction of postoperative complications has a significant financial impact in terms of reduction of the length of stay (improved bed utilization, reduced healthcare costs, earlier return to work etc.) and the healthcare costs of managing postoperative complications.