University of BRISTOL

Elizabeth Blackwell Institute for Health Research

Elizabeth Blackwell Institute Research for Health Scheme 2015

Stage 1 - Call for Challenges Application Form

Name	Dr Wesley Hayes

Challenge Title (max 20 Words)
Develop an objective tool to determine fluid overload in children receiving dialysis

Please describe the specific problem which needs addressing
Determining the appropriate target weight for children receiving dialysis is a significant challenge given the lack of reliable objective assessment techniques for total body fluid status. This currently relies on experienced clinicians' judgment taking in to account clinical parameters of blood pressure, clinical examination and intradialytic symptoms. A technique to enable objective assessment of children's fluid status is urgently needed. Emerging evidence from adult practice suggests that lung ultrasound can be used a sensitive measure of fluid overload in adult dialysis patients. This method has not yet been tested in children. Chest ultrasound may be a clinically useful, cost effective, risk free method of objectively assessing children's fluid status enabling accurate determination of the appropriate target weight on dialysis. Studies are needed to evaluate this.
How does this issue impact on you, your colleagues and your patients?
This issue impacts all oligoanuric children receiving haemodialysis or peritoneal dialysis. Assessment of children's fluid status remains a significant challenge in paediatric nephrology. To quote a paediatric nephrology consultant colleague, "assessment of children's fluid status is currently more of an art than a science". Developing an objective method of assessing fluid overload in children would better inform dialysis prescriptions and may impact children's long term cardiovascular health by reducing chronic extracellular fluid overload.
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)***

150 – 200 children per year receive dialysis for chronic kidney disease in the UK. All are affected by this issue. There are 10 transplanting UK paediatric nephrology centres in UK, all of which would benefit from a solution to this issue. Financial benefits to the NHS would come from reduction in cardiovascular risk in children and young people receiving dialysis from reduction on chronic subclinical fluid overload. Cardiovascular mortality of teenagers on dialysis is equivalent to that of people 5 decades older in the general population. Any reduction in this risk would reduce costs to the NHS as a whole in the long term.