



## Research for Health Scheme

### Stage 1 - Call for Challenges Application Form - 26

- 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](mailto: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)
<p>New approach of venous thromboembolism prophylaxis following joint replacement surgery – reducing the risk of wound oozing and bleeding</p>

Please describe the specific problem which needs addressing

According to the National Joint Registry there are approximately 160,000 total hip and knee replacements performed in England and Wales annually.

It has been long established that orthopaedic patients are at a risk of venous thromboembolism. Without thromboembolism prophylaxis approximately 1 in 3 patients (30% to 50%) undergoing hip or knee replacement develop asymptomatic deep vein thrombosis, with 1 in 30 (3.5%) suffering symptomatic thrombosis and 1 in 250 (0.4%) suffering a fatal pulmonary embolism.<sup>1</sup>

It is evident that the risk of thromboembolism needs to be reduced with mechanical and/or pharmacological methods. Several guidance and protocols have been published on the methods of thromboembolism prophylaxis in the recent years including the clinical guidance of the National Institute of Clinical Excellence.<sup>2</sup> Despite the large amount of scientific research and generated evidence on the perioperative thromboembolism prophylaxis there is still no consensus amongst clinicians regarding the ideal method of risk prevention. The British Orthopaedic Association emphasized the delicate balance between the risks and benefits for orthopaedic patients undergoing a major surgery, particularly the wound complications.<sup>3</sup>

Wound oozing and wound bleeding – partially as a side effect of chemical thromboembolism prophylaxis - apparently carry further risks of infection and delayed mobilization that can result in poor clinical outcome and patient experience, prolonged hospital stay and increased healthcare costs.<sup>4,5</sup>

The introduction of oral Factor Xa inhibitors (Rivaroxaban, Dabigatran) changed the previous approach to venous thromboembolism prophylaxis. Clinicians and patients were excited about the novel and much more patient friendly method. However following this initial introduction period evidence started to gather regarding the potential risks of the oral anti-Xa therapy. Wound oozing and wound bleeding were reported on scientific meetings and in the literature.<sup>6,7</sup>

The focus of previous research was on the major complications (i.e. severe bleeding as a primary safety outcome) of the Factor Xa inhibitor therapy, however studies were launched recently to enquire into wound oozing problems related to the therapy.<sup>8</sup>

Emersons Green Treatment Centre started to provide total knee and hip arthroplasties in 2009. We have applied oral Factor Xa inhibitor therapy as postoperative venous thromboembolism prophylaxis since then. As we have a constant drive to improve our processes in order to promote patient safety and patient experience, our arthroplasty protocols were carefully tailored to achieve better results. With the introduction of Enhanced Recovery Protocol we managed to reduce our length of stay significantly. Nevertheless we still experienced delays in patients' pathway because of wound oozing. Following a multidisciplinary consideration we decided to change our thromboembolism prophylaxis protocol. The introduction of oral thrombosis prophylaxis is delayed for 24 hours postoperatively whilst the initial period is covered with a single dose of low molecular weight therapy. We observed a significant improvement of wound oozing as a result of this change.

With our research initiative we would like to evidence scientifically that this method of venous thromboembolism prophylaxis is safe, cost effective and can improve the

patients' pathway.

#### References:

1. Demographics, Epidemiology and Risk of VTE - [http://reception.e-lfh.org.uk/vte/content/VTE\\_01\\_01/d/ELFH\\_Session/321/tab\\_455.html](http://reception.e-lfh.org.uk/vte/content/VTE_01_01/d/ELFH_Session/321/tab_455.html)
2. Venous thromboembolism: Reducing the risk – NICE CG92 - <http://guidance.nice.org.uk/CG92/QuickRefGuide/pdf/English>
3. BOA Background Document – VTE in orthopaedics - <http://www.boa.ac.uk/LIB/LIBPUB/Documents/VTE%20Background.pdf>
4. Infection after total hip replacement. With special reference to a discharge from the wound – SurinVV, Sundholm K, Backman L. – J Bone Joints Surg Br. 1983 Aug; 65(4) 412-8 - <http://www.ncbi.nlm.nih.gov/pubmed/6874711>
5. Wound problems in total knee arthroplasty – Vince KG, Abdeen A – Clin Orthop Relat Res. 2006 Nov; 252 88-90 <http://www.ncbi.nlm.nih.gov/pubmed/17079990>
6. Rivaroxaban increases wound bleeding in hip and knee arthroplasty patients compared to Enoxaparin – W Marlow, R Adam, J Walker, S Musthyala – J Bone Joint Surg Br, 2012 vol. 94-B no. XXXIX 89 SUPP [http://www.bjjprocs.boneandjoint.org.uk/content/94-B/SUPP\\_XXXIX/89.abstract?related-urls=yes&legid=jbjsbrproc;94-B/SUPP\\_XXXIX/89](http://www.bjjprocs.boneandjoint.org.uk/content/94-B/SUPP_XXXIX/89.abstract?related-urls=yes&legid=jbjsbrproc;94-B/SUPP_XXXIX/89)
7. Switch to Rivaroxaban Led to Higher Complication Rate – Terry Stanton - [http://www.aaos.org/news/acadnews/2012/AAOS17\\_2\\_8.asp](http://www.aaos.org/news/acadnews/2012/AAOS17_2_8.asp)
8. Evaluation of Wound Drainage After Knee or Hip Arthroplasty – Andrew Urquhart – University of Michigan - <http://clinicaltrials.gov/show/NCT02054936>

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

If we could evidence that our approach to postoperative venous thromboembolism prophylaxis is effective (the incidence of VTE and PE is not changed significantly compared to the nationally reported incidence) but safer in terms of reduced complications related to wound oozing and wound bleeding, that would bring a remarkable improvement to the care of patients undergoing arthroplasty. This would have an overall impact on all aspects of healthcare (patients' experience, patients' 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 160,000 arthroplasties performed in England and Wales annually. A safe, effective and patient friendly method of venous thromboembolism prophylaxis would bring major improvement to these patients' care. The reduction of postoperative complications has significant financial impact in terms of reduced length of stay (improved bed utilization, reduced healthcare costs, earlier return to work etc.) and the healthcare costs of managing postoperative complications.