<h1>‘<a>TEDS’ Talk – Use of Thrombo-embolic Deterrent Stockings Has No Significant Effect on Rates of Symptomatic Venous Thrombo-embolism After Primary Hip and Knee Arthroplasty: A Retrospective Cohort Study</h1>

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INTRODUCTION:

Lower limb arthroplasty carries a considerable risk of Venous Thrombo-embolism (VTE). Scottish Intercollegiate Guideline Network (SIGN) and local guidelines recommend a three-pronged approach to prevention of VTE in elective orthopaedic surgery including, extended chemical thromboprophylaxis (14 days for TKR and 35 days for THR), Thrombo-embolic Deterrent Stockings (TEDS) and pneumatic compression devices during the hospital stay following surgery. There has been recent published evidence in the UK, the GAPS trial, which suggests general surgical patients with moderate to high risk of VTE do not require mechanical thromboprophylaxis in the form of TEDS. This trial excluded patients undergoing lower limb arthroplasty and it remains unclear whether TEDS are necessary in this population or whether chemical prophylaxis with pneumatic compression devices are adequate.

METHODS:

Prior to the COVID pandemic we noted a high number of calls to the arthroplasty follow-up team relating to problems with TEDS. At the same time, the wards were also reporting some complications attributed to their use, including falls. The perceived risks associated with TEDS led to changes in hospital policy. From April 2021, patients undergoing primary total hip (THR) and total knee arthroplasty (TKR) were no longer issued with TEDS. They continued to be used in patients at increased risk of VTE e.g., those with underlying conditions predisposing to thrombosis, or a previous personal or family history of VTE or strokes. The chemical prophylaxis regimen and use of pneumatic foot pumps (during the inpatient stay) remained unchanged.

We performed a retrospective cohort study comparing rates of VTE in these two groups: Group 1 – TEDS and group 2 – no TEDS. The primary outcome measure was the rate of symptomatic VTE, including Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE), confirmed by imaging studies, within the initial follow-up period (6 weeks for TKR and 12 weeks for THR). We studied several secondary outcomes including rates of reported TEDS related complications and rates of inpatient falls. We performed a cost analysis based on the figures from both groups.

We included all patients undergoing primary hip or knee arthroplasty from January to December 2019, which was the last 'normal' year prior to the COVID pandemic where TEDS were routinely used, and from April to December 2021, where only high-risk patients were issued with TEDS (these were analysed in the TEDS group). We excluded patients from 2020 because the total numbers undergoing surgery were low and follow-up was difficult due to pandemic restrictions. Data was collected retrospectively at follow-up review from the Scottish Care Information Store, a national hospital records database. We reviewed all records and investigations from post-operative hospital attendances to determine if a VTE event had occurred. Reports from the hospital events and complications reporting system was used to collect data for inpatient falls and complications.

Statistical analysis was performed using contingency tables to calculate the Relative Risk (RR). We used Fisher's Exact Test to determine the statistical significance. A p-value of less than 0.05 was considered significant. Confidence intervals (CI) were calculated at the 95% level.

RESULTS:

In total, 5029 patients were included in the study. Of those, 3284 were in the TEDS group and 1745 were in the no TEDS group. In 2019, 100% (3258/3258) of patients were issued with TEDS compared to only 1.47% (26/1771), considered 'high-risk', following withdrawal of routine use in April 2021. The rate of VTE in the TEDS group was 0.30% (10/3284) and 0.34% (6/1745) in the no TEDS group (RR1.13, CI 0.43-2.99). There was no statistically significant difference between the groups (p=0.80). Similarly, the risk of inpatient falls with was 1.52% (50/3284) in the TEDS group and 1.89% (33/1745) in the no TEDS group (RR 1.25, CI 0.81-1.95). There was no statistically significant difference between the groups (p=0.35). Additionally, there were 3 reported TEDS related complications during the period of routine use and none following withdrawal. We estimated that expenditure on TEDS during the 2019 period was £3.72/patient and £0.06/patient after ending routine use. The total cost of TEDS in the 2019 period was £12,118; assuming a similar rate of use continues in high-risk patients (1.47%), this amounts to a projected saving of £11,940 per year based on 2019 figures.

DISCUSSION AND CONCLUSION:

We found that use of TEDS has no statistically significant effect on the risk of VTE for patients undergoing primary total hip or knee arthroplasty, and this is consistent with the findings from the GAPS trial. There are other factors that may affect the rate of VTE, such as shorter length of hospital stay and earlier mobilisation combined with targeted prevention. The evidence base is currently limited, and we recognise that our data is from a single centre population and recommend

that further multi-centre randomised controlled trials are undertaken to look at the effect of TEDS (and other chemical and mechanical methods) on VTE rates in major joint arthroplasty.