

# Improving adherence to guidelines for extended venous thromboembolism prophylaxis in patients with colorectal cancer

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## Abstract

Extended venous thromboembolism prophylaxis (EVTEP) with low-molecular weight heparin such as enoxaparin for 28 days following surgery for cancer significantly reduces venous thromboembolic events compared to a standard 6-10 day course. National Institute of Clinical Excellence (NICE) guidelines suggest EVTEP should be offered to patients undergoing colorectal cancer surgery. Local EVTEP prescribing and monitoring guidelines in a busy inner city teaching hospital colorectal surgery unit, were devised to ensure NICE guidelines are followed. Adherence to local EVTEP guidelines was recorded through a retrospective audit of patients undergoing elective colorectal cancer surgery during February 2011 (n=19). Prospective re-audit cycles were undertaken during April-May (n=17) and September-December 2012 (n=17). The first audit cycle revealed that overall standards were not being met with just 11% of 'at risk' patients being correctly identified in pre-operative assessment clinic and continued low adherence to guidelines on the ward with only 44% of patients being prescribed EVTEP at discharge. Following each audit cycle, educational interventions were directed towards the multi-disciplinary team involved in the care of patients undergoing colorectal cancer surgery. This involved education of the team members regarding EVTEP, presentation of the audit results with instruction for improvement. Results of the second and third audit cycles showed improvements in guideline adherence with 100% of patients in these cohorts having been prescribed EVTEP at discharge. Marked improvements were also seen in the correct identification of 'at risk' patients, patient education in pre-operative assessment clinic, and warning of potential side-effects. This project has shown a significant global improvement in EVTEP-related patient care and adherence to local guidelines following education of the multi-disciplinary team involved, which consequently reduced the risk of venous thromboembolism within this patient cohort.

## Problem

Patients undergoing major abdominal surgery for cancer without venous thromboembolism (VTE) prophylaxis have a 30% increased risk of VTE compared with those without cancer, and statistically 0.9% will die of a pulmonary embolism.[1,2] Extended venous thromboembolism prophylaxis (EVTEP) with enoxaparin, a low-molecular weight heparin, for 28 days following surgery for cancer has a 60% risk reduction for VTE compared with a standard 6-10 day course.[3] National Institute of Clinical Excellence (NICE) guidelines suggest EVTEP should be offered to patients undergoing colorectal cancer surgery to reduce these risks.[4]

Local policy guidelines had been developed in 2010 which stated that patients undergoing elective or emergency colorectal cancer surgery should be offered 28 days of enoxaparin post-operatively to reduce the risk of thromboembolic events. In light of this, a retrospective baseline audit was undertaken which revealed that despite numerous members of the multi-disciplinary team were being involved in pre and post-operative care, only a minority of patients were being correctly identified for EVTEP and being discharged with an extended course of enoxaparin.

## Background

The unit's 'EVTEP Prescribing and Monitoring' policy sets out six standards as follows:

- i) Identification of patients for EVTEP in pre-operative assessment clinic
- ii) Patient education
- iii) Warning of potential side-effects
- iv) Highlighting 'at risk' patients by sticker affixation to the drug chart
- v) Teaching of self-injection and safe syringe disposal to enable the patient to feel confident with self-administration
- vi) Correct completion of the discharge letter and prescription

Several measures have been implemented in order to encourage correct identification and post-operative care of patients requiring EVTEP. These include reminders on the pre-operative assessment proforma to aid identification of 'at risk' patients by colorectal surgery consultants, provision of patient information, and affixing a sticker (Figure 1) to the front of the drug chart by pre-operative assessment clinic nursing staff to highlight the patient during admission. Whilst on the ward, specialist colorectal ward nurses have a post-operative proforma which includes reminders for teaching of self-injection and syringe disposal if EVTEP is indicated. Doctors have the option to select a pre-populated paragraph on the electronic discharge summary software which inserts information about the extended course onto the discharge letter. Pharmacists perform a final check of the discharge letter and prescription,

ensuring the patient receives the extended course if required.

## Baseline Measurement

The initial audit looked retrospectively at all patients undergoing elective colorectal cancer surgery during February 2011 (n=19). The process involved recording adherence to EVTEP guidelines from data in medical notes, pre-operative assessment proformas, drug charts, and patient discharge letters. Where possible, patients were also asked about matters relating to their experience and a checklist completed by nursing staff on the colorectal ward at the time of patient discharge was also analysed.

Overall, standards were met poorly with only 11% of 'at risk' patients being correctly identified in pre-operative assessment clinic and continued poor adherence to policy on the ward. Only 16% of patients had been provided with patient information, just 44% had been discharged with the extended course of enoxaparin, and only 33% of patients had post-discharge monitoring advice on their discharge letter. Table 1 shows the baseline results across all standards.

See supplementary file: ds1993.pdf - "Tables"

## Design

As there were many different measures in place to remind staff about EVTEP, it was decided that the most appropriate intervention would be education directed towards members of the multidisciplinary team, highlighting the importance of EVTEP as well as current practice by presenting baseline results.

## Strategy

Following the initial audit; its findings, explanations about the importance of EVTEP, and methods for guideline adherence were presented to the multi-disciplinary team. This involved short educational presentations to specialist colorectal ward nurses, pharmacists, junior doctors, and staff in pre-operative assessment clinic. There were discussions with colorectal consultants, and emails were sent to all junior doctors and surgical trainees who had the potential to be working with colorectal cancer patients, informing them about EVTEP guidelines, audit results, and areas for improvement.

During April-May 2012 a second cycle of audit was undertaken (n=17) using methods similar to those described to obtain baseline data. However, collection of data during this cycle was undertaken prospectively rather than retrospectively, to minimise the amount of missing data. Results showed significant improvements in adherence to local EVTEP policy. Table 1 shows the results of the second audit cycle. Following this cycle, educational interventions as mentioned previously were again delivered to the multi-disciplinary team and emails were sent to junior doctors and trainees highlighting the results and areas for further improvement.

## Results

During September-December 2012, a third audit cycle was completed. Data were collected prospectively for colorectal cancer inpatients that had passed through the pre-operative assessment clinic (n=17). Improvements were seen across most standards from the results of the second cycle of audit. Results of all cycles can be seen in Table 1 and graphically in Figures 2-10. Comparing the results of the baseline and third audit cycle measurements, there were improvements across all standards to varying degrees. At the pre-operative assessment clinic, correct identification of patients for EVTEP improved from 11% to 88%, patient information provision improved from 16% to 76%, warning of potential side-effects improved from 5% to 82%, and sticker affixation to the drug chart improved from 37% to 59%. Whilst on the ward, teaching self-injection to patients improved from 32% to 100%, teaching safe disposal of syringes improved from 63% to 88%, and patient confidence improved from 20% to 88%. Correct completion of discharge letters increased from 33% to 88%. 100% of patients in the second and third audit cohorts had been prescribed EVTEP at discharge, compared with only 44% of patients in the initial audit cohort.

See supplementary file: ds1994.pdf - "Figures"

## Lessons and Limitations

This project has highlighted that involvement and education of all clinical staff working with patients who have had colorectal cancer surgery is paramount in ensuring adherence to EVTEP clinical guidelines, to ensure maximal patient safety. Each discipline has its own set of roles to play to ensure provision of optimal care.

There is still room for improvement across all standards, particularly regarding affixation of stickers to drug charts, and this is hoped to be achieved through continual education. Specialist colorectal ward nursing staff are generally employed in permanent positions with no rotation between teams or wards. There are always, however, newcomers to the team, and pharmacists as well as medical and surgical trainees rotate through specialties (including Colorectal Surgery) on a regular basis. Therefore it is essential that education regarding EVTEP policy be continuous. It is particularly useful to provide education to these members of staff when they begin working on the ward, as part of the handover process from previous colleagues to ensure they are aware of EVTEP.

A further important criterion should be monitoring of whether or not patients completed administration of the entire course of enoxaparin after discharge, and whether or not they developed VTE or had side-effects, which could be addressed through additional projects in the future. Furthermore, the current local policy guidelines are based on national guidance produced by NICE. Local policy should be revised periodically in line with updated guidance as and when there is a substantive body of evidence relating to post-surgical VTE prophylaxis, which may involve using newer anticoagulants.

## Conclusion

This project has shown a significant global improvement in EVTEP-related patient care and adherence to local guidelines following educational interventions to the multi-disciplinary team involved. Marked improvements were seen in the correct identification of 'at risk' patients, patient education in pre-operative assessment clinic, and warning of potential side-effects. Prescriptions being completed correctly after the initial intervention meant all patients requiring EVTEP were provided with the full 28-day course of thromboprophylaxis at discharge, administration of which significantly reduces the risk of venous thromboembolism in this patient group.

## References

1. Geerts WH, Heit JA, Clagett GP, Pineo GF, Colwell CW, Anderson FA, Jr., et al. Prevention of venous thromboembolism. *Chest*. 2001;119(1 Suppl):132S-75S.
2. Kakkar AK, Williamson RC. Prevention of venous thromboembolism in cancer patients. *Seminars in thrombosis and hemostasis*. 1999;25(2):239-43.
3. Bergqvist D, Agnelli G, Cohen AT, Eldor A, Nilsson PE, Le Moigne-Amrani A, et al. Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer. *The New England Journal of Medicine*. 2002;346(13):975-80.
4. National Institute for Health and Clinical Excellence. Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital. (Clinical guideline 92.) 2010. <http://guidance.nice.org.uk/CG92>.

## Declaration of interests

Nothing to declare.

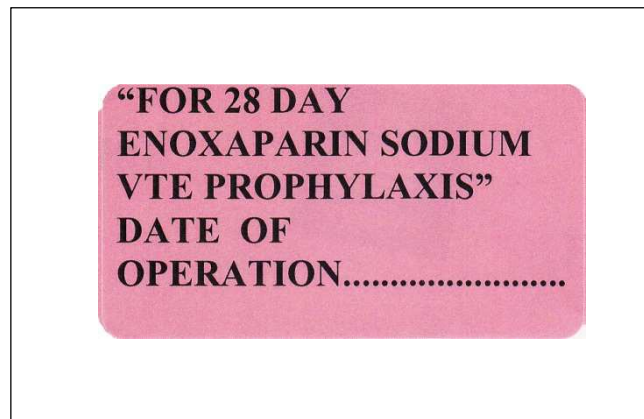
## Acknowledgements

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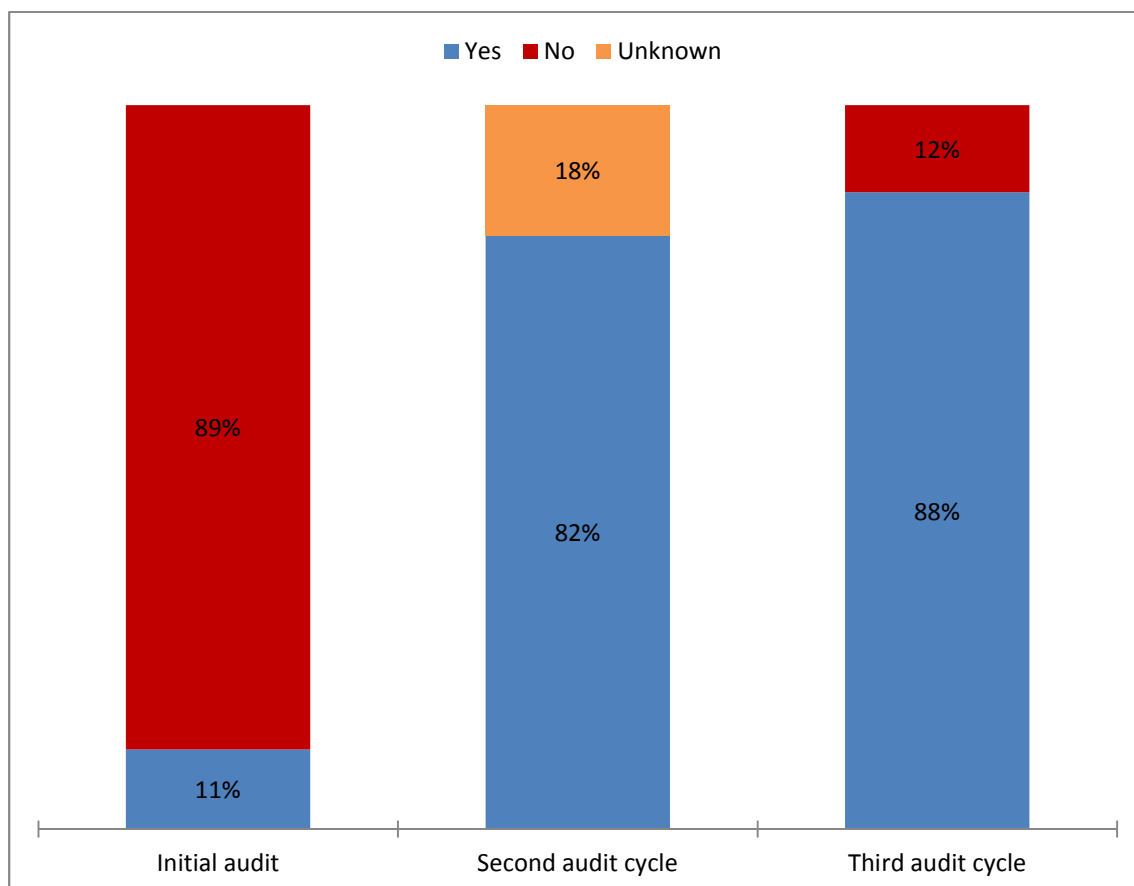
**Table 1 – Results for each standard across the three audit cycles**

	<b>Initial audit (n=19)</b>	<b>Second audit cycle (n=17)</b>	<b>Third audit cycle (n=17)</b>
<b>Standard 1: Was the patient identified in pre-operative assessment clinic and placed on EVTEP programme?</b>			
Yes	11%	82%	88%
No	89%	0%	12%
Unknown	0%	18%	0%
<b>Standard 2: Was the patient given information regarding VTE and EVTE in pre-operative assessment clinic?</b>			
Yes	16%	82%	76%
No	84%	12%	24%
Unknown	0%	6%	0%
<b>Standard 3: Was the patient warned about potential side-effects and what to do if experienced?</b>			
Yes	5%	18%	82%
No	95%	82%	18%
<b>Standard 4: Was there a sticker affixed to front of patient's drug chart highlighting the fact that they are for EVTEP?</b>			
Yes	37%	35%	59%
No	63%	65%	41%
<b>Standard 5: Was the patient taught how to self-inject whilst on the ward?</b>			
Yes	32%	87%	100%
No	5%	0%	0%
Unknown	63%	13%	0%
<b>Standard 6: Was the patient taught how to safely dispose of syringes?</b>			
Yes	63%	54%	88%
No	0%	13%	6%
Unknown	37%	33%	6%
<b>Standard 7: Was the patient confident with EVTEP and self-administration at discharge?</b>			
Yes	20%	67%	88%
No	0%	0%	12%
Unknown	80%	33%	0%
<b>Standard 8: Was the patient's discharge letter correctly completed and GP advised about monitoring?</b>			
Yes	33%	100%	88%
No	67%	0%	12%
<b>Was the patient prescribed EVTEP on discharge?</b>			
Yes	44%	100%	100%
No	56%	0%	0%

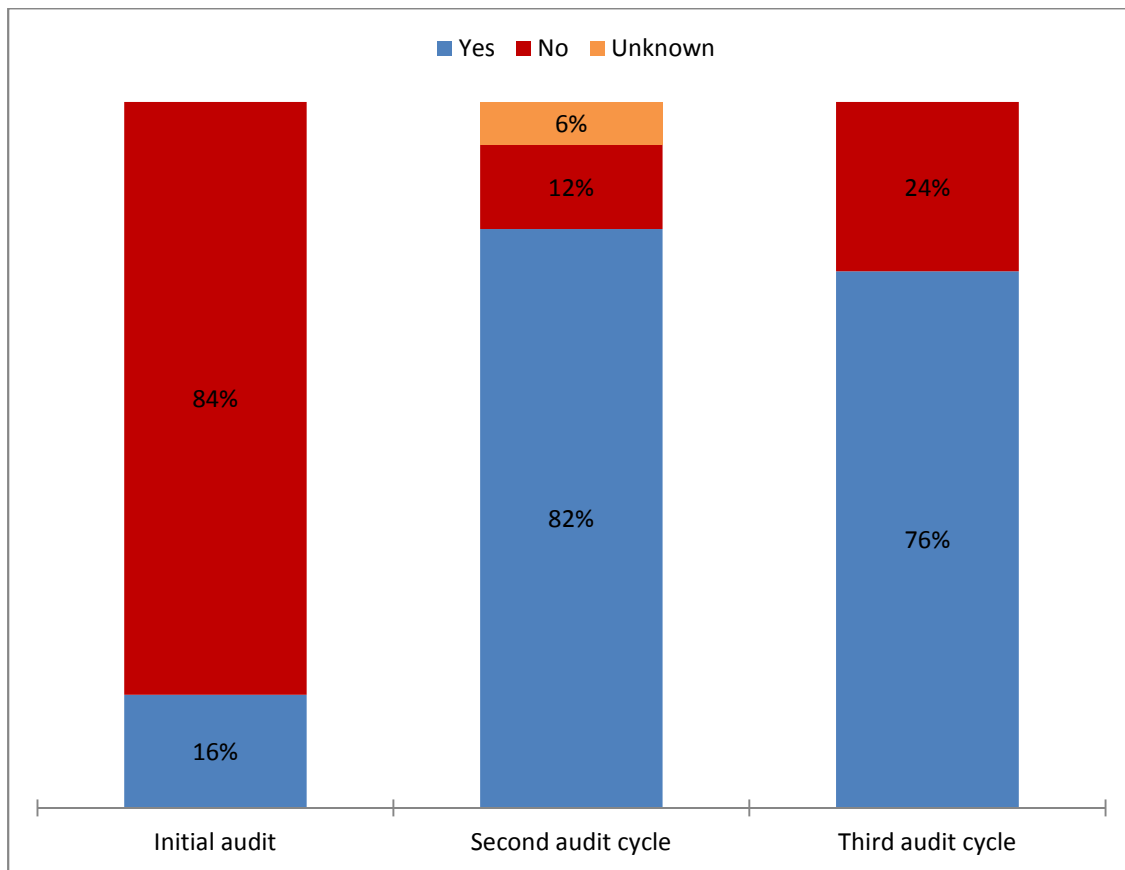
**Figure 1** – Example of sticker for affixation to front of patient drug chart highlighting ‘at risk’ patient for EVTEP



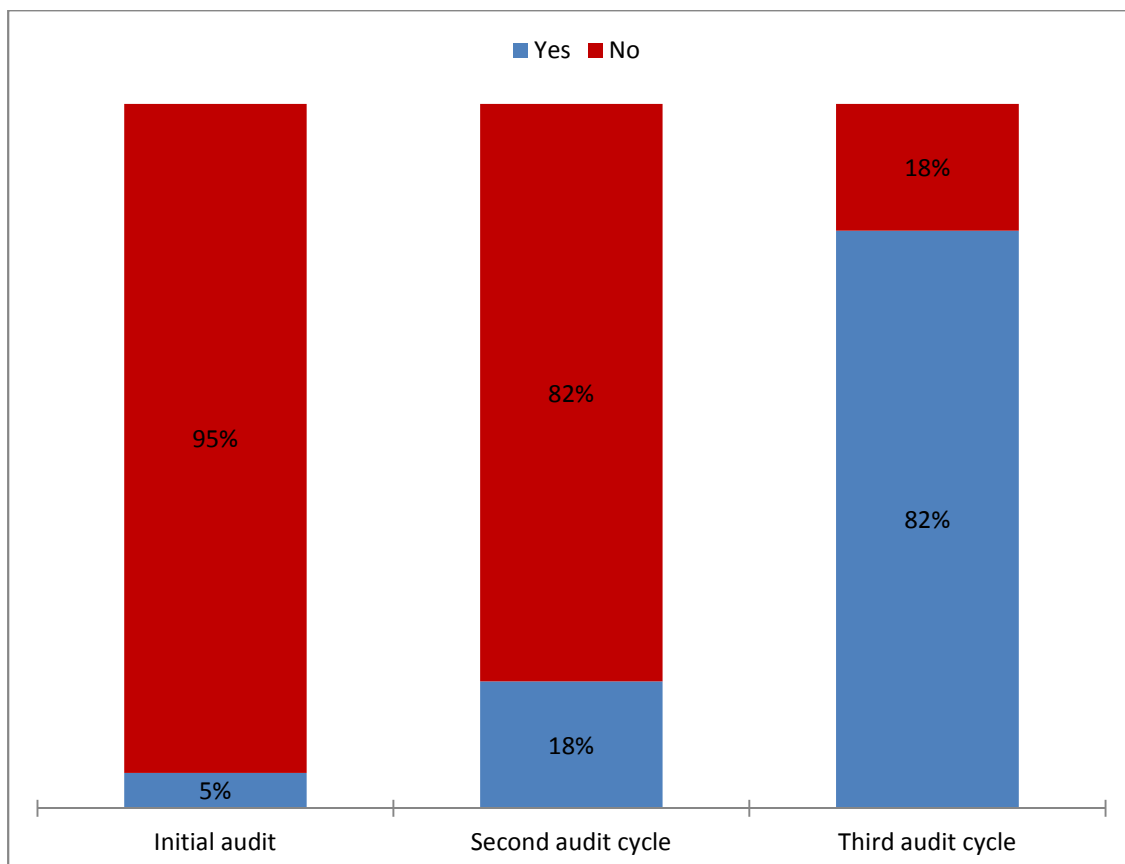
**Figure 2** – Graph to show results for Standard 1: Was the patient identified in pre-operative assessment clinic and placed on EVTEP programme?



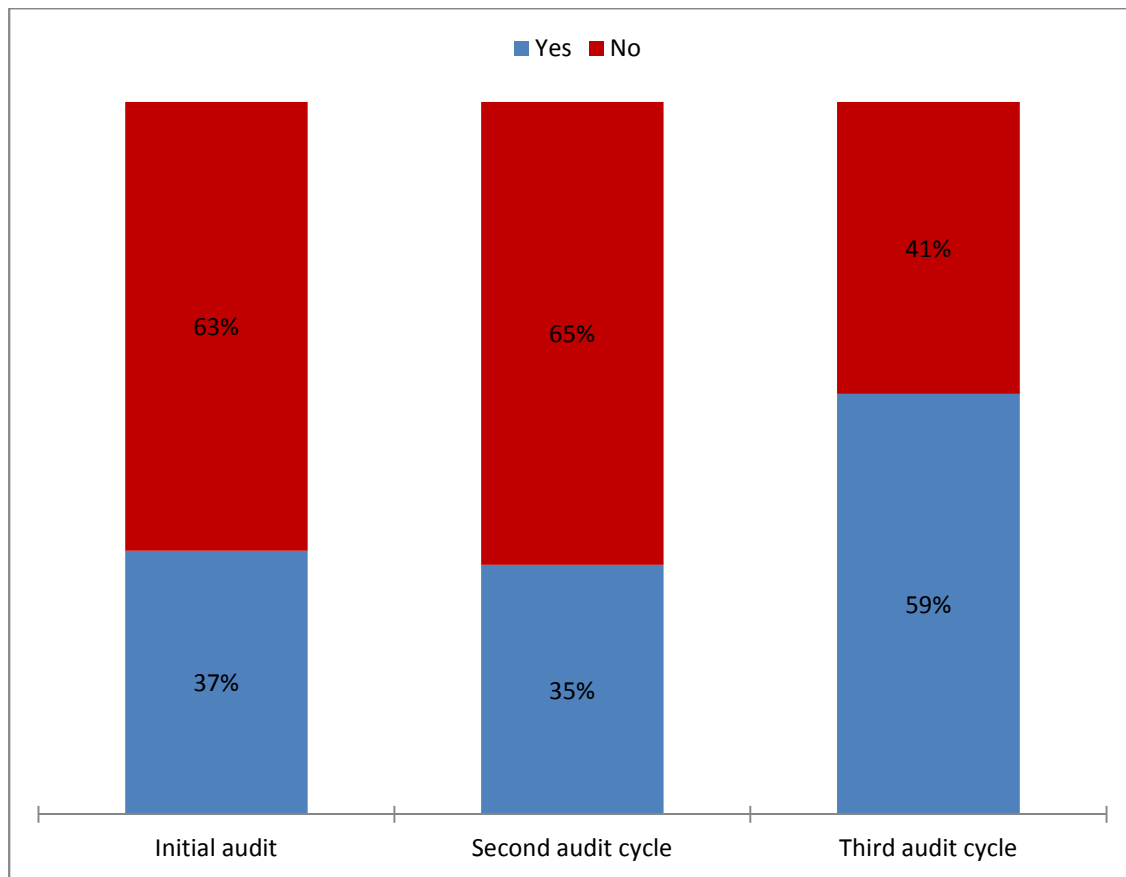
**Figure 3** – Graph to show results for Standard 2: Was the patient given information regarding VTE and EVTE in pre-operative assessment clinic?



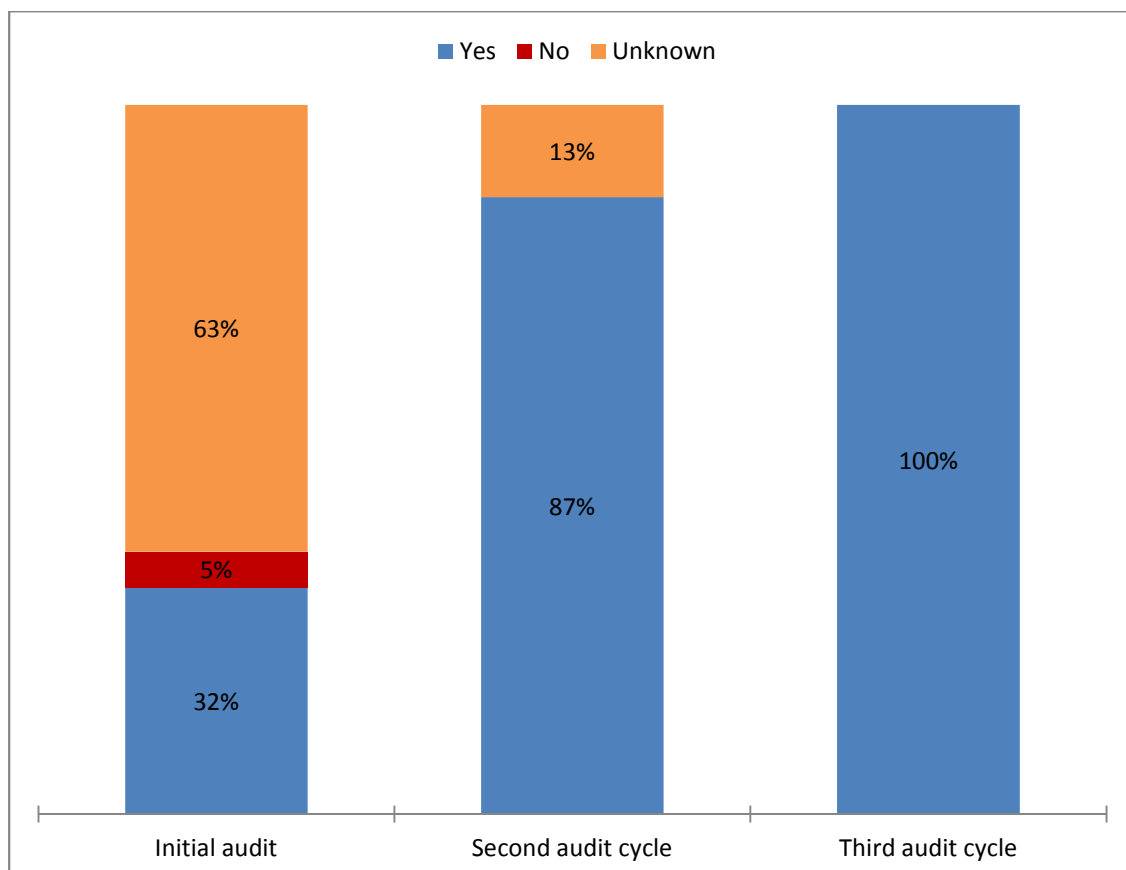
**Figure 4** – Graph to show results for Standard 3: Was the patient warned about potential side-effects and what to do if experienced?



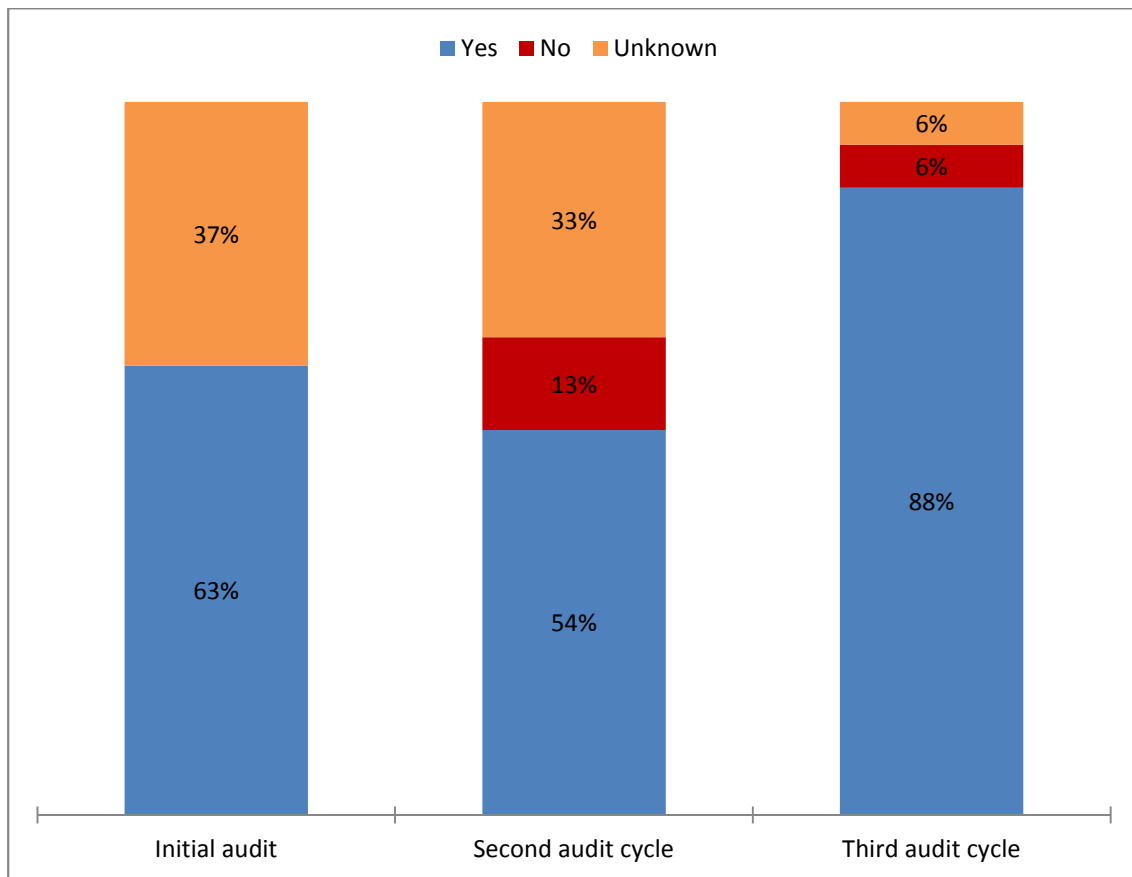
**Figure 5** – Graph to show results for Standard 4: Was there a sticker affixed to front of patient’s drug chart highlighting the fact that they are for EVTEP?



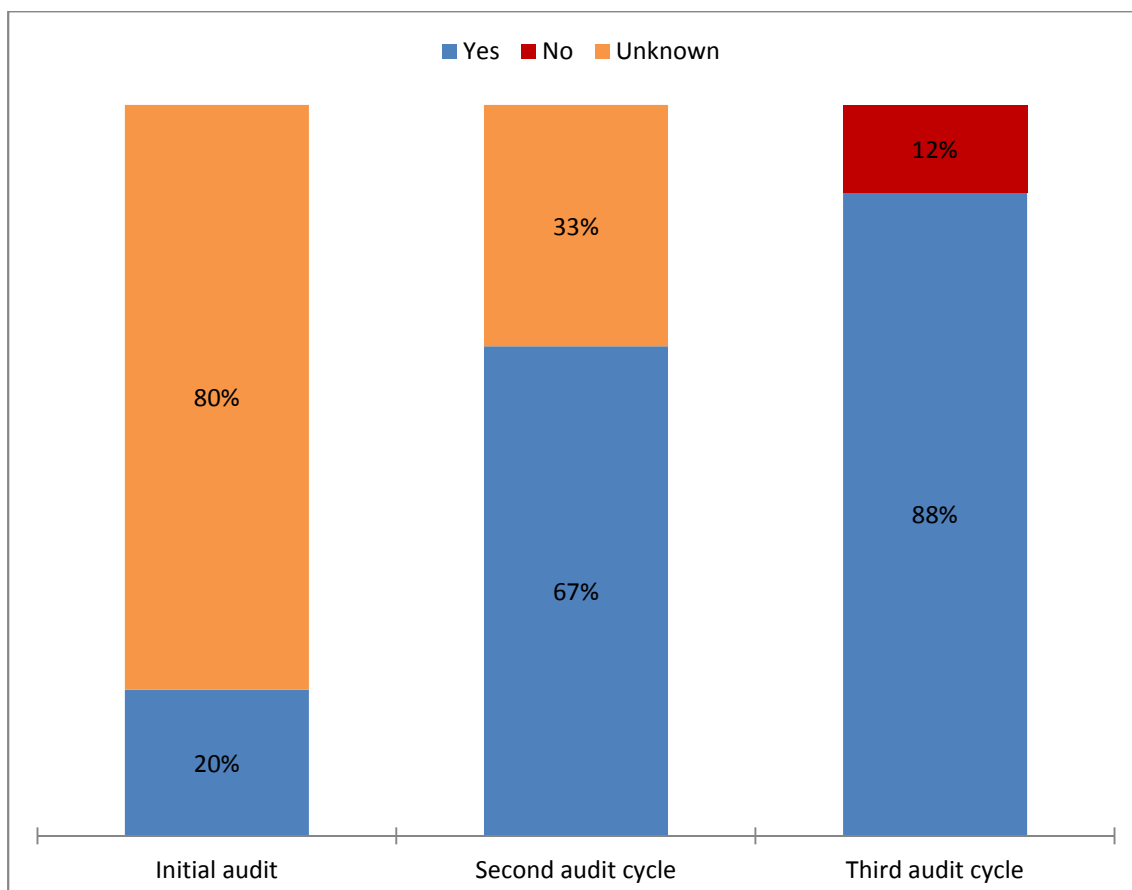
**Figure 6** – Graph to show results for Standard 5: Was the patient taught how to self-inject whilst on the ward?



**Figure 7** – Graph to show results for Standard 6: Was the patient taught how to safely dispose of syringes?

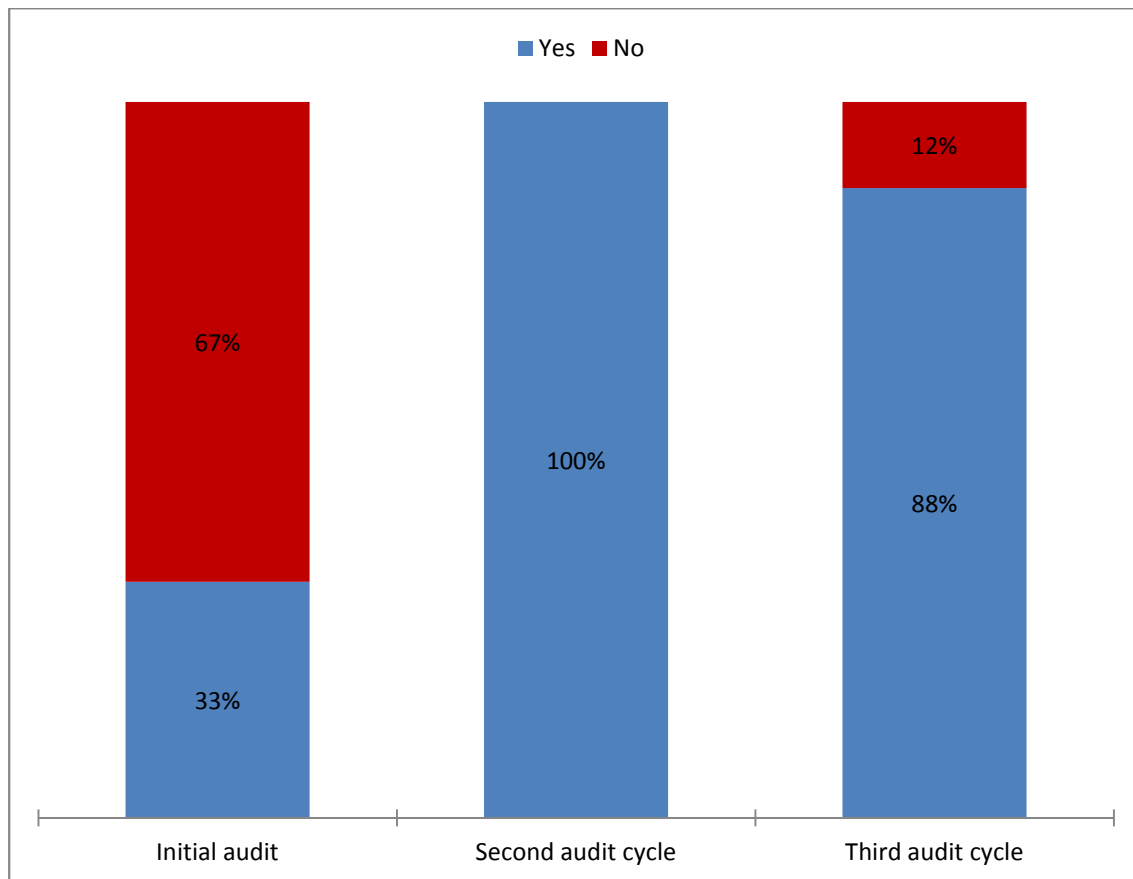


**Figure 8** – Graph to show results for Standard 7: Was the patient confident with EVTEP and self-administration at discharge?





**Figure 9** – Graph to show results for Standard 8: Was the patient’s discharge letter correctly completed and GP advised about monitoring?



**Figure 10** – Graph to show whether the patient was prescribed EVTEP on discharge

