# Venous Thromboembolism - A Snapshot
National VTE Audit Day Recap Report 2013

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A Snapshot on Venous Thromboembolism

Background

Venous thromboembolism (VTE) comprises both deep vein thrombosis (DVT) and pulmonary embolism (PE). DVT occurs when a blood clot forms inside a vein deep in the leg, causing leg pain and swelling. A blood clot in a leg vein can grow, break off, and travel to the lungs, resulting in shortness of breath, chest pain, and, in some cases, death. Clots that travel to the lungs are called pulmonary emboli.

Almost all hospital patients are at risk for VTE and most have multiple risk factors.1

Venous thromboembolism is one of the most common and preventable complications of hospitalization2 and is a Required Organizational Practice (ROP) of Accreditation Canada. The rate of hospital-acquired VTE, if a thromboprophylaxis is not used, is 10-40% after general surgery and 40-60% after hip surgery.2 Hospital-acquired VTE can result in symptomatic DVT or PE, fatal PE, prolonged hospital stay or readmission, harm of therapeutic anticoagulation, patient anxiety, additional costs to diagnose and treat, and further consequences.

National Venous Thromboembolism Audit Day Overview

The inaugural National Venous Thromboembolism (VTE) Audit Day took place on Monday, April 10, 2013, to raise awareness and gain insight into the appropriate thromboprophylaxis use across Canada for patients at risk of VTE. From coast to coast, 118 healthcare sites participated in the one-day audit, with data collected from 4,667 patients in general internal medicine (64%) and general surgery (31%). The majority of provinces participated in the Canadian audit, with the exception of Quebec, Northwest Territories, Nunavut and the Yukon.

The VTE Audit was simple and quick to complete (approximately 60 minutes). Participants were asked to do chart reviews to collect data on patients from Internal Medicine and General Surgery. Typically, at least 20 patients from each group were included in the audit. The audit consisted of four questions:

1. Were preprinted Order Sheets used on admission, or after surgery?
2. What type of thromboprophylaxis was used?
3. Did the patient receive the appropriate thromboprophylaxis? (See Appendix C: Appropriate Thromboprophylaxis)
4. If no to question 3, state the reason the recommended thromboprophylaxis was not used.

Key Findings

- 81% of patients received the appropriate thromboprophylaxis
- When Preprinted Order Sets are used, 91% of patients received the appropriate thromboprophylaxis, compared to only 71% when the orders were handwritten
- Preprinted Order Sets were used in 57% of general medicine and 51% of general surgery patients
- The type of prophylaxis used most often (90% of patients) was a Low molecular Weight Heparin (LMWH) and low dose Heparin (LDH) [includes dalteparin, enoxaparin, nadroparin, tinzaparin, or fondaparinux], followed by Low molecular weight Heparin only (61% of patients)
- Only 4% of patients received mechanical prophylaxis
- There was variability in the types of thromboprophylaxis used by patient group:
  - Medical: LMWH vs LDH (70% vs 21%)
  - Surgical: LMWH and LDH similar (45% and 46%)
- 19% did not receive an appropriate thromboprophylaxis. Reasons included:
  - No thromboprophylaxis indicated - 70%
  - Delay in start - 9%
  - Wrong dose - 8%
  - Modality varied from Safer Healthcare Now! recommendations - 6%

A workbook providing detailed instruction on how to participate in VTE Audit Day and tools to assist with data collection was available online. A copy of the workbook is available online at: http://www.saferhealthcarenow.ca/EN/events/other/VTEAuditDay/Documents/VTE%20audit%20day%20instructions.pdf

A VTE National Audit Day webinar was held on March 26, 2013 to provide an overview of the data collection process and to answer participant’s questions. To view the webinar or download the slides, visit: http://www.saferhealthcarenow.ca/EN/events/other/VTEAuditDay/Pages/default.aspx

See Appendix A: Survey Results for a summary of key findings. To access full results of the audit, visit http://www.slideshare.net/PatientSafetyCanada/vte-audit-day-20130521.

To access a webinar presentation on the VTE Audit Day results, visit: http://www.saferhealthcarenow.ca/en/events/nationalcalls/2013/pages/national-vte-audit-day-results-and-feedback.aspx
Data Collection

A Data Collection tool was developed by the Safer Healthcare Now! Central Measurement team. Participants could individual Data Collection Forms using Patient Safety Metrics, or once teams registered for VTE Audit Day, Data Collection Forms would be prepared by the Central Measurement Team. See Appendix B: VTE Audit Day Data Collection Form for an example.

The deadline to submit completed forms was set for April 30, 2013. Completed forms were faxed or submitted online through Patient Safety Metrics and results were provided within about 30 minutes of submission, directly to the participants.

Eligibility Criteria

- Identifying Audit Sample
  Four possible options for determining the audit sample include:
  1. All eligible medial and general surgical patients
  2. A sample of eligible patients (consecutive patients or random sample)
  3. All eligible medical OR surgical patients
  4. A sample of eligible medical, or a sample of eligible surgical patients

- Inclusion:
  - Patients in hospital on April 10th AND with an actual or expected length of stay (LOS) of more than two calendar days
  - Patients admitted between April 10th and 18th with an actual or expected LOS of at least two calendar days

- Exclusion:
  - Patients in hospital >30 calendar days
  - Patients receiving therapeutic doses of anticoagulants

- Internal Medicine:
  - Patients admitted with:
    - CHF, severe respiratory disease, or confined to bed with active cancer, previous VTE, sepsis, acute neurologic disease, inflammatory bowel disease

- General Surgical Patients:
  - Low risk (excluded)
    - Non-major surgery and fully mobile and NO additional VTE risk factors
  - All other general surgical patients are eligible if they meet the general criteria for eligibility
Evaluation

A survey was conducted to evaluate the effectiveness of the data collection tool and to gain insight into participation in VTE Audit Day. A copy of the evaluation survey is available in Appendix D: VTE Audit Day Feedback Survey, or can be accessed online at http://survey.patientsafetyinstitute.ca/n/zzzfm.aspx

Survey Feedback
- Responses were received from about 20% of the 118 sites reporting
- Two-thirds of respondents rated the data collection tool very good to excellent
- Two-thirds of respondents indicated that they would continue to use the tool to collect VTE data
- 100% of respondents indicated that they would participate in VTE Audit Day again next year

Anecdotal Comments
- “We shared our results with our Executive and Department Heads. We got a lot of feedback and it brought VTE to the forefront. We would definitely participate in VTE Audit Day again.” Melanie Hewett, Safer Healthcare Now! Coordinator (Central Health)
- “You need to audit on a regular basis and bring the results back to the table for everyone to see. Never give up; show your staff and physicians what they have accomplished and let them take ownership. Healthcare providers want to do what is best for the patient.” Andree Guy, Quality and Patient Safety Advisor (Dr. Georges Dumond Hospital - Vitalité Health Network)
- “Engaging physicians and leadership in the process was a critical component to successful implementation of an updated VTE prophylaxis protocol. Physicians took the lead in the development of updated order sets.” Lynn Budgell, Patient Safety Coordinator (Halton Healthcare)
Success Stories

Central Health overcomes resistance in implementing a VTE strategy across the region

When Central Health embarked upon developing a Venous Thromboembolism Policy and Pre-printed Order Sheets, a baseline audit found that some physician groups were administering thromboprophylaxis in accordance with evidence-based guidelines. The VTE team knew there were areas for improvement to ensure all clients were receiving appropriate prophylaxis. A physician group identified as having VTE prophylaxis embedded in their daily practice was approached to be champions to help move a VTE strategy throughout the health authority. After some discussion, the team recognized that they needed to engage a physician group who were keen to champion the initiative and were interested in making changes in their practice to align with the evidence-based practices for VTE prophylaxis.

A new physician order sheet was developed as a trigger tool to ensure clients were risk-assessed for VTE prophylaxis and it was appropriately administered. It also enabled the team to measure compliance through audits and provide feedback for staff with respect to areas for improvement. The Pre-Printed Order Sheet was then rolled out to physicians at Central Health’s two referral centres and rural sites across the region. A robust education rollout ensued and the Chiefs of Staff were engaged to support the initiative and promote participation. It took just over a year to implement the strategy across the region with all physician groups taking part.

“You have to listen to find your physician champions and work with them,” says Melanie Hewett, Safer Healthcare Now! Coordinator, Central Health. “You need to determine who is passionate about the particular care issue and who can help you drive the initiative.”

“We were very committed and we promoted the fact that the VTE strategy was being implemented for the safety of the patient,” says Melanie Hewett. “We partnered with physicians to make the Pre-printed Order Sheet more user-friendly and adapted it along the way. It was challenging to introduce the form across a large geographic area, but we did a considerable amount of advance communication with our staff to ensure VTE was a priority.”

Central Health participated in VTE Audit Day in April 2013. They prepared a one-pager to summarize their results, which mirrored the national average, and shared it with the CEO, Chiefs of Staff, physicians and staff across the region. “People read our report and we received a lot of feedback,” says Melanie Hewett. “We would definitely participate in the VTE Audit Day again.”
Halton Healthcare engages physicians to reduce hospital-acquired VTE

When venous thromboembolism (VTE) became an Accreditation Canada Required Organizational Practice, Halton Healthcare knew that their physician practice with Preprinted Order Sets and the appropriate use of thromboprophylaxis was quite high. A VTE treatment working group had been established as far back as 2001 to address deep vein thrombosis. They had provided education on VTE and implemented different strategies; however, limited auditing had been done over the years.

Two years ago, an interdisciplinary team that included representatives from surgery, medicine, internal medicine, chiefs of staff and others was formed to revisit Halton’s VTE strategy. The team did a baseline audit, developed a project charter, and conducted major and minor tests for compliance to see what work they needed to do. Developing an improved Pre-printed Order Set for both medical and surgical patients and having many physician champions participating on the interdisciplinary team made the difference in strengthening compliance with appropriate thromboprophylaxis.

Halton Healthcare Services is comprised of three hospitals. Committed physicians at each site emerged as the key physician VTE leaders. “They could see that they were in this together and wanted to make it happen,” says Lynn Budgell, Patient Safety Coordinator. “We were able to succeed in putting something together that our physicians could stand behind.”

“There was great leadership and tremendous interest clinically about the importance of this,” adds Lynn Budgell. “We created the new order sets and after much discussion and debate about the inclusion of a risk scoring tool, the consensus was that it would serve as a good tool to support decision-making for physicians in ordering prophylaxis.”

Colourful signage for both healthcare providers and patients helped to educate and keep VTE at the forefront. A ‘Dear Doctor’ letter was created by the Working Group physicians and is sent by pharmacy staff to physicians when prophylaxis is not ordered on admission for appropriate patients. The interdisciplinary team physicians were consulted as to the appropriate formats for education of the physician groups. The team is now refining the process for auditing and submitting data so that ongoing measurement of progress is an organizational priority.

“Physician involvement was essential to our success and included physicians from different disciplines across all three sites,” says Dr. Jane Wilkinson, VTE interdisciplinary team member at Halton Healthcare Services. “Physicians provided our interdisciplinary team with the lens of the frontline provider, anticipating obstacles and acting as champions amongst their colleagues. Audit results are made available to physicians frequently as feedback and to provide solutions where needed.”
Audits and patient participation help Moncton hospital achieve 100 per cent compliance with administering thromboprophylaxis

The staff at Dr. Georges-L.-Dumont University Hospital Centre in Moncton, New Brunswick first started working on a venous thromboembolism strategy in 2008. They have established Preprinted Order Sets that clinicians continually update; held educational sessions to get physicians and frontline staff onboard; and regularly conduct audits through chart reviews.

Most recently, a walking program was established for patients with venous thromboembolism. A patient brochure has been prepared that talks about how to recognize the signs and symptoms of thromboembolism and illustrates exercises when immobile, such as how to move your toes, so that the patient can participate in their care.

Andrée Guy, Quality and Patient Safety Advisor, Dr. Georges-L.-Dumont University Hospital Centre (Vitalité Health Network) says that the Safer Healthcare Now! Venous Thromboembolism strategy is a goldmine that has helped them achieve 100 per cent compliance with administering appropriate thromboprophylaxis. “The VTE strategy has everything in it and provides evidence-based best practice.”

Audits determine if Preprinted Orders have been used and if the appropriate thromboprophylaxis was administered on patients. To provide a more complete picture of venous thromboembolism, about 30 charts are also pulled and reviewed for patients discharged in the previous three months. They look to see if medication was given on discharge and if the patient came back to Emergency for a problem related to VTE.

“You need to audit on a regular basis and bring the results back to the table for everyone to see,” says Andrée Guy. “It takes time to get everyone on board. Never give up; show your staff and physicians what they have accomplished and let them take ownership for their results.”
National VTE Audit Day provides a snapshot of prophylaxis use

In order to gain insight into appropriate thromboprophylaxis use across Canada for patients at risk of VTE, Canadian Venous Thromboembolism (VTE) Audit Day was held Monday, April 10, 2013. Some 118 healthcare sites participated from coast to coast, with data collected from 4,667 patients in general internal medicine (64 per cent) and general surgery (31 per cent).

“The audit results were encouraging in that 81 per cent of patients received the appropriate thromboprophylaxis; however there is room for improvement since 19 per cent of patients at risk for VTE did not receive appropriate thromboprophylaxis,” says Dr. Bill Geerts, National VTE Prophylaxis Lead for Safer Healthcare Now! “The audit provides a snapshot of how we were doing nationally on the day that data was collected and reinforces that we need to continue to make a commitment to our patients to prevent hospital-acquired VTE. Overall, 79 per cent of general medical patients and 84 per cent of general surgery patients received appropriate thromboprophylaxis.”

Of particular interest was that when preprinted order sets are used, 91 per cent of patients received the appropriate thromboprophylaxis, compared to only 71 percent when the orders were hand written. Preprinted order sets were used in 57 per cent of general medicine and 51 per cent of general surgery audited.

While the results varied by province and by region, the type of prophylaxis used most often (for 90 per cent of patients) was a Low Molecular Weight Heparin (dalteparin, enoxaparin, nadroparin, tinzaparin, or fondaparinux) or low dose Heparin. Only four per cent of patients received mechanical prophylaxis. Among the at-risk patients who were not receiving appropriate thromboprophylaxis, 70 per cent were not receiving any thromboprophylaxis. Other reasons included administering the wrong dose, delay in starting and insufficient duration.

“The audit is a valuable tool to monitor prophylaxis use and many organizations indicated that they would continue to use the data collection tool to measure their results and progress in quality improvement,” added Dr. Geerts. “From a national perspective, the audit highlighted some gaps in knowledge and areas that we can address in further education efforts and future National Calls.”

The VTE Data Collection Tool is available for organizations to access from CPSI’s Patient Safety Metrics at www.patientsafetymetrics.ca. This tool utilizes optical mark recognition (OMR) technology allowing users to complete the audit on paper, fax the results, and have the result automatically uploaded into the Patient Safety Metrics System for reporting and analysis.

A National Call took place on May 21st to review the audit results which were compiled and analyzed by the Safer Healthcare Now! Central Measurement Team.

To access results of the audit visit www.slideshare.net/PatientSafetyCanada/vte-audit-day-20130521 or to learn more about VTE Audit Day, visit www.saferhealthcarenow.ca

To learn more about Patient Safety Metrics or the VTE Data Collection Tool contact the Central Measurement Team at metrics@saferhealthcarenow.ca, or call 416-946-3103.
Endorsements
An initiative of the Canadian Patient Safety Institute, National VTE Audit Day was endorsed by Accreditation Canada, BC Patient Safety and Quality Council, Manitoba Institute for Patient Safety, Nova Scotia Ministry of Health and Wellness, Ontario Hospital Association, Saskatchewan Ministry of Health and The Ottawa Hospital.

Additional Resources
To learn more about VTE Audit Day, visit www.saferhealthcarenow.ca

The Venous Thromboembolism Getting Started Kit can be downloaded from http://www.saferhealthcarenow.ca/EN/Interventions/vte/Documents/VTE%20Getting%20Started%20Kit.pdf

Examples of Preprinted Order Sets, Pocket Cards outlining the four-step process and recommended appropriate thromboprophylaxis, and other resources are available at: http://www.saferhealthcarenow.ca/EN/Interventions/vte/Pages/resources.aspx
Appendix A: Survey Results

Appropriate Thromboprophylaxis

- Audit result are based on 118 sites reporting data on 4,667 patients

Responses by Province

- Patient Groups included General Medicine (64%), General Surgery (31%), Medical and Surgical Patients (2%) and Other (2%). Other includes xxx.

Responses by Major Patient Group

- General Medicine: 2,973 sites (64%)
- General Surgery: 1,453 sites (31%)
- Medical and Surgical Patients: 109 sites (25%)
- Other: 93 sites (7%)
• Overall audit results indicate that 81% of patients received the appropriate thromboprophylaxis.

Appropriate Thromboprophylaxis - Overall Rates

N=4,667

% of patients

- 81%
- 79%
- 85%
- 60 Not reported

• 79% of General Medicine patients received the appropriate thromboprophylaxis, compared to 85% of General Surgery patients.

Appropriate Thromboprophylaxis - By Major Patient Group

% of patients

- General Medicine: 79%
- General Surgery: 84%
- Medical and Surgical: 89%
- Other: 74%

www.saferhealthcarenow.ca
• The provincial average of patients receiving the appropriate thromboprophylaxis topped 100% in Manitoba, to a low of 65% in Nova Scotia.

![Bar chart showing Appropriate Thromboprophylaxis by Province.]

• The number of patients receiving the appropriate thromboprophylaxis in General Medicine and General Surgery during the Audit period.

![Bar chart showing Appropriate Thromboprophylaxis by Province and Major Patient Group.]
Regional results compared to the National Average

Appropriate Thromboprophylaxis - by Province and Region

National Average = 81%

Types of Thromboprophylaxis
- A combination of low molecular weight heparin (LMWH) and low dose heparin (LDH) was administered by 90% of respondents; LMWH only was administered by 61% of respondents

Type of Thromboprophylaxis - Overall

N=4,581 (3,619 on TPX)

- LMWH + LDH = 90%
- LMWH = 61%

- LMWH = dalteparin, enoxaparin, fondaparinux, nadroparin, tinzaparin
- Other = apixaban, dabigatran, rivaroxaban, warfarin (only 6%)
In General Medicine, LMWH was administered on 69.5% of patients and LDH on 20.8% of patients. In General Surgery, LMWH was administered on 45.3% of patients and LDH of 45.6% of patients. Mechanical prophylaxis was administered of 4.6% of patients in General Medicine and 3.3% of patients in General Surgery.

Provincial reporting on type of thromboprophylaxis
- Type of thromboprophylaxis by province and major patient group

![Type of Thromboprophylaxis - by Province and Major Patient Group](image1)

- Type of thromboprophylaxis by province and region

![Type of Thromboprophylaxis - by Province and Region](image2)
Reasons for NOT using Thromboprophylaxis

- Respondents reported that 398 patients in General Medicine and 129 in General Surgery did not receive any thromboprophylaxis.

![Diagram showing reasons for not using thromboprophylaxis by major patient group]

- Reasons for not using thromboprophylaxis varied from did not receive any thromboprophylaxis (classified as not appropriate), wrong dose, delay in starting after surgery or admission, following alternate standards, wrong drug, mechanical alone, without bleeding contraindication, or insufficient duration.

![Diagram showing reasons for not using thromboprophylaxis by province]
- Results by province and major patient group

**Reasons for not using Thromboprophylaxis - by Province and Major Patient Group**

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<td>Mechanical alone without bleeding contraindication</td>
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<td>Insufficient duration</td>
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**Reasons for not using Thromboprophylaxis - by Province and Region**

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Use of Preprinted Order Sets

- 55% of respondents used Preprinted Order Sets

![Preprinted Order Use - Overall Rates](image)

- Preprinted Orders Sets were used for 57% of General Medicine patients and 51% of General Surgery patients

![Preprinted Order Use - by Major Patient Group](image)
• Provincial use of Preprinted Order Sets varied from about 15% to over 60%

• Preprinted Order set use by province and major patient group
• ORDER SETS IMPROVED THE USE OF AN APPROPRIATE THROMBOPROPHYLAXIS:
  91% of patients received the appropriate thromboprophylaxis when order sets were used; compared to only 71% when order sets were not used

• Use of Preprinted Order Sets in General Medicine varied between a high of 72% of to a low of 7%; in General Surgery from a high of 70% to a low of 11%
Appendix B: VTE Audit Day Data Collection Form

VTE Audit Day: April 10th 2013

Image of the Data Collection Form that will be emailed to you.

| Intervention: VTE - Venous Thromboembolism Prevention |
| Organization: 100 Mile District General Hospital |
| Unit: East Wing |
| Patient Sample: Hip Fracture Surgery |
| Age Group: 85 years of age or over |
| Patient Type: In Patient |

| Contact Name and Phone Number (Include area code): |
| FAX Form in FINE Resolution to 1-877-685-9850 |
| For more Information: 416-949-3103 or metrics@saferhealthcarenow.ca |
| Access your data at https://www.med.storists.ca/metrics |

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<th>Type of thromboprophylaxis</th>
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<td>9</td>
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<td></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

FAX Form in FINE Resolution to 1-877-685-9850
Printed On: 2012-12-16

www.saferhealthcarenow.ca
Appendix C: Appropriate Thromboprophylaxis

Recommended doses of Anticoagulant Prophylaxis are outlined in the VTE Getting Started Kit and VTE pocket cards, available at www.saferhealthcarenow.ca

**Recommended Doses of Anticoagulant Prophylaxis**

<table>
<thead>
<tr>
<th>Agent</th>
<th>Comments</th>
<th>Recommended Dose(s)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMWH** Low Molecular Weight Heparin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dalteparin (Fragmin®)</td>
<td>5,000 units subcutaneously once daily</td>
<td></td>
</tr>
<tr>
<td>enoxaparin (Lovenox®)</td>
<td>40 mg subcutaneously once daily OR 30 mg subcutaneously twice daily</td>
<td></td>
</tr>
<tr>
<td>tinzaparin (Innohep®)</td>
<td>4500 units subcutaneously once daily</td>
<td></td>
</tr>
<tr>
<td>Heparin**</td>
<td>5,000 units subcutaneously every 12 hours OR every 8 hours</td>
<td></td>
</tr>
<tr>
<td>Fondaparinux (Arixtra®)</td>
<td>2.5 mg subcutaneously once daily</td>
<td></td>
</tr>
<tr>
<td>Rivaroxaban (Xarelto®)</td>
<td>Hip or knee replacement surgery prophylaxis only</td>
<td>10 mg by mouth once daily</td>
</tr>
<tr>
<td>Dabigatran (Pradax®)</td>
<td>Hip or knee replacement surgery prophylaxis only</td>
<td>220 mg by mouth once daily (150 mg if age &gt;75 or CrCl 30-50 ml/min)</td>
</tr>
<tr>
<td>Apixaban (Eliquis®)</td>
<td>Hip or knee replacement surgery prophylaxis only</td>
<td>2.5 mg by mouth twice daily</td>
</tr>
</tbody>
</table>

* recommended dose may be altered by renal dysfunction, low body weight, obesity, pregnancy

** a preoperative dose may be given if appropriate
Appendix D: VTE Audit Day Feedback Survey

Canadian VTE Audit Day

Your feedback is extremely valuable. Please take a few moments to complete this evaluation and share your thoughts with us.

1. Tell us about yourself:
   - [ ] First name
   - [ ] Last name
   - [ ] Email
   - [ ] Job title
   - [ ] Organization

2. Please rate the data collection tool used during Canadian VTE Audit Day

<table>
<thead>
<tr>
<th>Poor</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

3. Would you recommend the data collection tool to a colleague?
   - [ ] Yes
   - [ ] No

4. Will you continue to collect VTE data and submit results to Patient Safety Metrics?
   - [ ] Yes
   - [ ] No

5. For Canadian VTE Audit Day.
   - What went well?
   - What could we improve upon?

6. What other data collection forms would you be interested in?

7. We're already starting to plan for next year, can we count on you to participate in Canadian VTE Audit Day 2014?
   - [ ] Yes
   - [ ] No

Thank you!

Feedback Survey link: [http://survey.patientsafetyinstitute.ca/n/zzzf.aspx](http://survey.patientsafetyinstitute.ca/n/zzzf.aspx)