ISQIC Post-Discharge VTE Chemoprophylaxis Toolkit V2

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How to Use This Toolkit

This toolkit provides an overview of general strategies that may be useful if post-discharge prophylaxis is not being ordered consistently, as well as ideas for different interventions. *You will likely need to adapt the intervention(s) you choose so that they work in the local care environment of your institution.* We hope you will find the examples useful and that you can easily tailor the interventions to your institution's needs.

This following functions have been added to this pdf to make it easy to navigate:

1. This pdf is searchable so you can type a word into the search box and be taken to places in the toolkit where that search item appears.
2. You can click on any section header or sub-header in the Table of Contents and be taken to that section.
3. You can click on the ISQIC logo in the bottom right corner of each page and be taken back to the Table of Contents.
4. Click on the reference to an appendix in the text and be taken directly to that appendix.
5. For any functional example with a caption that says "Double click image to open attachment" you can double click and the attachment will open. To get back to the Toolkit, click on 'Close' in the file menu and you will be able to re-open the Toolkit. This will only work if the toolkit is the only open PDF. If instead you want to view an attachment, while also viewing the Toolkit, use the Attachments Toolbar on the left side of the screen. Double click on the attachment you want to open and it will open as a separate PDF. Attachments can only be accessed if the toolkit is opened using an Adobe product.

Citing Functional Examples from This Toolkit

If you decide to use one of the functional examples listed in this toolkit and it was made by a specific institution, please reference that institution. If the material was instead created by the ISQIC Coordinating Center, please use the citation that we created for the toolkit.

Illinois Surgical Quality Improvement Collaborative. (01/15/2016). ISQIC Post-Discharge VTE Prophylaxis Toolkit [Brochure]. Chicago, IL: Illinois Surgical Quality Improvement Collaborative

Feedback on This Toolkit

We hope this toolkit will assist your hospital in deciding which intervention may be optimal in your local care context. We welcome all feedback so we can iteratively update the toolkit to highlight new interventions, clarify existing ones, and generally make the toolkit more user-friendly and helpful. Please send any questions, comments, or overviews of what your institution implemented to Shelby Parilla (sparilla@isqic.org).

Contents

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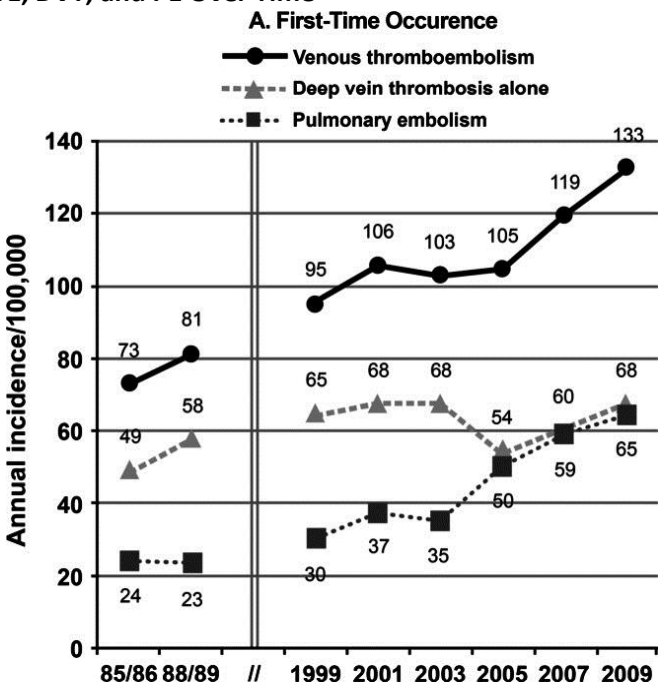
Overview of Venous Thromboembolism (VTE)

According to the CDC, VTE is the leading cause of preventable hospital death in the United States. Each year, approximately 900,000 people in the U.S. are affected by blood clots (DVT/PE), of which approximately 50% are healthcare-associated (HA-VTE). Approximately 7-11% of all DVT/PE cases in the US result in premature death.[3] Figure 1 shows the steady increase in VTE incidence over time. When comparing hospital cost differences between patients with VTE and active cancer and patients with active cancer but no VTE, the group with VTE had hospital costs over 5 years 2x that of the group with no VTE ($49, 351 vs $26,529 respectively).[4] By utilizing VTE prevention methods, the number of HA-VTE cases can be reduced by 70%.[3]

There are two types of VTE: deep vein thrombosis (DVT) and pulmonary embolism (PE). Deep vein thrombosis is a clot within a deep vein, usually in the leg but can also originate in the arm or other veins. Pulmonary embolism can occur when a DVT clot travels to the lungs and precludes blood supply movement. A number of factors influence a person's risk of developing VTE including surgery, cancer, immobilization, hospitalization, older age, obesity/overweight, smoking, inflammatory bowel disease (IBD), and other chronic health problems.[5] For example, patients with IBD have a 1.5-3.6x higher risk of developing VTE than patients without IBD.[8]

Surgery is a major risk factor for VTE, especially lower limb orthopedic procedures (total knee and hip arthroplasty specifically) and abdominal/pelvic surgery for cancer. The risk of VTE increases 2-3x postoperatively in patients who underwent abdominal or pelvic surgery for cancer. [6] In total knee arthroplasty (TKA) patients, DVT is the most frequent postoperative complication while PE is attributed to causing half of postoperative deaths after total hip arthroplasty (THA).

Figure 1. Incidence of VTE, DVT, and PE Over Time[24]



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Reducing the Risk of VTE Post-Discharge

The risk of VTE does not end when a patient leaves the hospital. Data suggests that the majority of VTE events occur in the first 3 months following hospitalization. [7] There are a number of both pharmacologic and non-pharmacologic methods that can be used to reduce the risk of VTE post-discharge including early ambulation, sequential compression devices (SCDs), and blood-thinning prophylaxis. Risk assessment tools are one way to determine which patients are at high risk for post-discharge VTE.

Risk Factors for VTE

Numerous VTE risk factors are well studied and documented in evidence-based literature. Older age, presence of malignancy, prior deep vein thrombosis, surgery or trauma, hypercoagulable disorders, length of operation, and possibly obesity are all established VTE risk factors.[14,15] Patients undergoing specific surgery types are at greater risk of postoperative VTE than others including abdominal/pelvic surgery for cancer, total knee replacement, total hip replacement, and surgery for IBD.

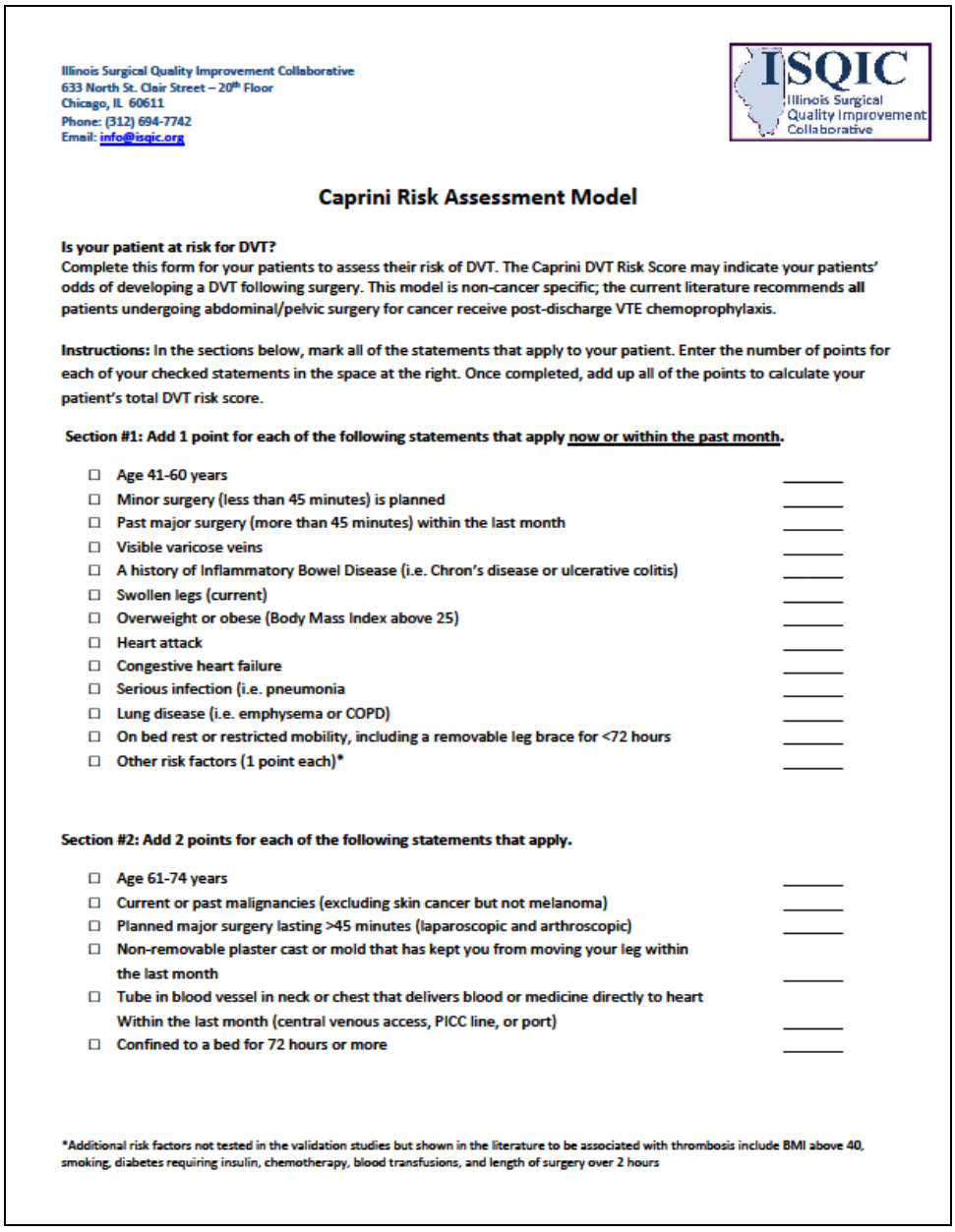
Risk Assessment Tools

The **Caprini Risk Assessment Model** (RAM) was developed in 2005 for surgical patients and categorizes VTE risk into four categories (low, moderate, high, and highest) by summing individual risk factors. Table 1 shows the risk categories and their corresponding summative scores. The Caprini RAM includes a variety of risk factors such as age, prior history, family history of VTE, cancer, congestive heart failure, IBD, obesity, recent surgery, etc.[9] This model is non-cancer specific; the current literature recommends **all** patients undergoing abdominal/pelvic surgery for cancer receive post-discharge VTE chemoprophylaxis.

Table 1. Caprini RAM Scoring

Risk Category	Caprini RAM Score
Lowest	0 Points
Low Risk	1-2 Points
Moderate Risk	3-4 Points
High Risk	5-8 Points
Highest Risk	≥9 Points

The document below can be printed and used to perform the Caprini Risk Assessment on patients at your hospital.



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Caprini Risk Assessment Model

Is your patient at risk for DVT?
Complete this form for your patients to assess their risk of DVT. The Caprini DVT Risk Score may indicate your patients' odds of developing a DVT following surgery. This model is non-cancer specific; the current literature recommends all patients undergoing abdominal/pelvic surgery for cancer receive post-discharge VTE chemoprophylaxis.

Instructions: In the sections below, mark all of the statements that apply to your patient. Enter the number of points for each of your checked statements in the space at the right. Once completed, add up all of the points to calculate your patient's total DVT risk score.

Section #1: Add 1 point for each of the following statements that apply now or within the past month.

- ☐ Age 41-60 years _____
- ☐ Minor surgery (less than 45 minutes) is planned _____
- ☐ Past major surgery (more than 45 minutes) within the last month _____
- ☐ Visible varicose veins _____
- ☐ A history of Inflammatory Bowel Disease (i.e. Chron's disease or ulcerative colitis) _____
- ☐ Swollen legs (current) _____
- ☐ Overweight or obese (Body Mass Index above 25) _____
- ☐ Heart attack _____
- ☐ Congestive heart failure _____
- ☐ Serious infection (i.e. pneumonia _____
- ☐ Lung disease (i.e. emphysema or COPD) _____
- ☐ On bed rest or restricted mobility, including a removable leg brace for <72 hours _____
- ☐ Other risk factors (1 point each)* _____

Section #2: Add 2 points for each of the following statements that apply.

- ☐ Age 61-74 years _____
- ☐ Current or past malignancies (excluding skin cancer but not melanoma) _____
- ☐ Planned major surgery lasting >45 minutes (laparoscopic and arthroscopic) _____
- ☐ Non-removable plaster cast or mold that has kept you from moving your leg within the last month _____
- ☐ Tube in blood vessel in neck or chest that delivers blood or medicine directly to heart Within the last month (central venous access, PICC line, or port) _____
- ☐ Confined to a bed for 72 hours or more _____

*Additional risk factors not tested in the validation studies but shown in the literature to be associated with thrombosis include BMI above 40, smoking, diabetes requiring insulin, chemotherapy, blood transfusions, and length of surgery over 2 hours

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VTE Chemoprophylaxis

VTE chemoprophylaxis (anticoagulants) should be prescribed to patients after specific surgeries to reduce the risk of post-discharge VTE. There are numerous types of FDA approved VTE chemoprophylaxis options. Direct oral anticoagulants include Rivaroxaban (Xarelto), Dabigatran (Pradaxa), Apixaban (Eliquis), and Edoxaban (Savaysa). Low molecular weight heparin (LMWH) and unfractionated heparin (UH) are two types of injectable anticoagulants. There is overwhelming evidence to support the use of LMWH for post-discharge VTE chemoprophylaxis in postoperative surgical patients

(abdominal/pelvic surgeries for cancer, and orthopedic procedures.). Studying the use of LMWH in patients undergoing surgery for IBD is a new field of study, one that has, thus far, produced weak evidence on the efficacy of using LMWH in IBD surgical patients to reduce post-discharge VTE. Newer oral anticoagulants (Xarelto, Pradaxa, Eliquis and Savaysa) are only currently indicated for use in total knee replacement and total hip replacement patients.

Current evidence-based guidelines recommend prescribing anticoagulant medication for patients undergoing abdominal/pelvic surgery, total hip arthroplasty and total knee arthroplasty due to their increased risk of postoperative VTE. There is growing evidence that patients undergoing surgery for IBD are also high risk for VTE. Total knee replacement and hip replacements patients should be prescribed anticoagulant therapy for an average of 10-14 days postoperatively.[10,11,16] The American College of Chest Physicians recommend the use of low-molecular weight heparin or low-dose unfractionated heparin for abdominal/pelvic cancer surgery patients.[12] Anticoagulants are recommended to be prescribed for 28-35 days following abdominal/pelvic surgery for cancer.[13]

The American College of Chest Physicians recommend the following evidence based guidelines:

Table 2. ACCP Recommendations[16,17]

Caprini Risk Category	Abdominal/Pelvic Surgery Recommendations	Total Knee Replacement Recommendations	Total Hip Replacement Recommendations
Low Risk	N/A	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days
Moderate Risk*	LMWH Gold Standard: LMWH for 28 days	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days
High Risk*	LMWH Gold Standard: LMWH for 28 days	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days and IPC	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days
Highest Risk*	LMWH Gold Standard: LMWH for 28 days	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days and IPC	LMWH, fondaparinux, apixaban, dabigatran, rivaroxaban, LDUH, Warfarin, or Aspirin for 10-14 days

LMWH = low molecular weight heparin, LDUH = low dose unfractionated heparin, IPC = intermittent pneumatic compression, ES=elastic stockings

*only for patients who are NOT at high risk for major bleeding complications and LMWH and LDUH is not contraindicated

More information can be found in and disseminated using the downloadable handout below.

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VTE Chemoprophylaxis: Anticoagulants

Type	Medication Name	Administration	Indication	Main Limitations
Factor Xa Inhibitor	Rivaroxaban (Xarelto) Apixaban (Eliquis) Edoxaban (Savaysa) Fondaparinux (Arixtra)	Oral (Rivaroxaban, Apixaban, Edoxaban) Subcutaneous Injection (Fondaparinux)	Prophylaxis and treatment of DVT and PE in patients undergoing knee and hip replacement No FDA indication for extended VTE prophylaxis for abdominal/pelvic surgery for cancer	No FDA indication for use in patients with abdominal/pelvic surgery for cancer Cost Medication adherence concern (no monitoring)
Thrombin Inhibitor	Dabigatran (Pradaxa)	Oral	Prophylaxis and treatment of DVT/PE after hip replacement No FDA indication for extended VTE prophylaxis for abdominal/pelvic surgery for cancer	No FDA indication for use in patients with knee replacement or abdominal/pelvic surgery for cancer Requires renal function monitoring Medication adherence concerns (no monitoring)
Vitamin K Antagonist	Warfarin (Coumadin)	Oral	Prophylaxis and treatment of venous thromboembolism and pulmonary embolism	Frequent patient monitoring (cost and burden) Dosing difficulty (varies based on genetics, BMI, diet, etc.) Delayed full effect (non-rapid anticoagulation)
Low Molecular Weight Heparin (LMWH)	Dalteparin (Fragmin) Enoxaparin (Lovenox)	Subcutaneous Injection	Traditional "Gold Standard" for prophylaxis and treatment of venous thromboembolism and pulmonary embolism	Cost Patient adversity to self-injection Rapid effect
Unfractionated Heparin (UH)	N/A	Subcutaneous Injection	Prophylaxis and treatment of venous thromboembolism and pulmonary embolism but is INFERIOR to LMWH	Required administration 3x per day Patient adversity to self-injection Increased number of immune-allergic thrombocytopenia compared to LMWH Increased # of postoperative DVT when compared to LMWH
Acetylsalicylic Acid	Low-Dose Aspirin	Oral	Prophylaxis prevention of VTE for standard risk patients	Studies have shown inferior VTE results using Aspirin compared to other anticoagulants

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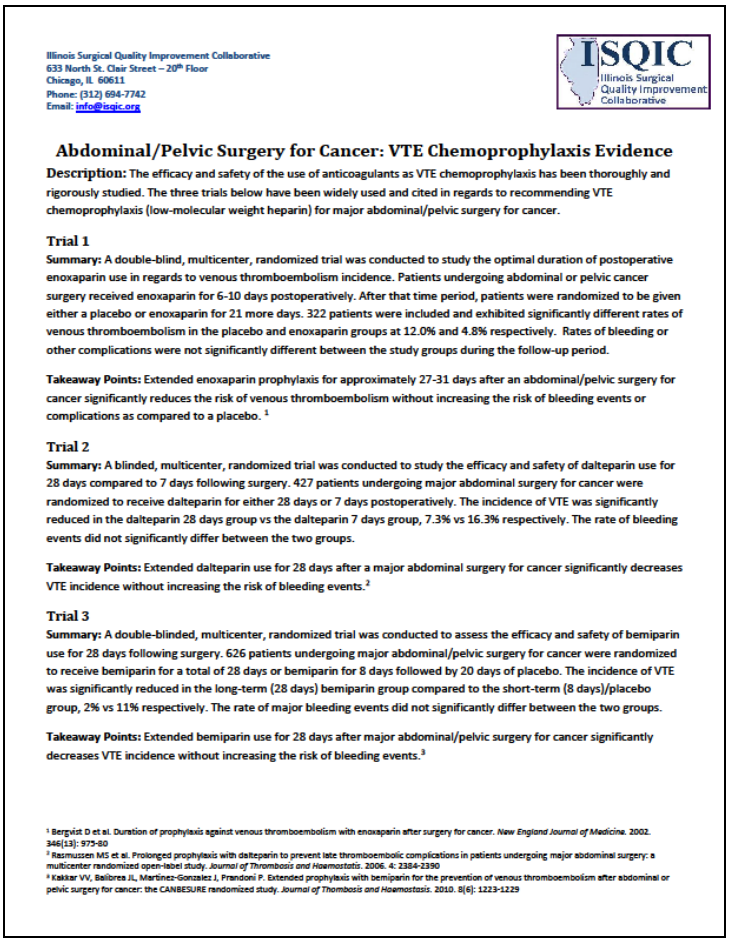
VTE Chemoprophylaxis Evidence

Major Abdominal/Pelvic Cancer Surgery

A number of blinded, randomized clinical trials have assessed the safety and efficacy of extended chemoprophylaxis (primarily LMWH) use following major abdominal/pelvic cancer surgery. Of these trials, it is widely accepted in the surgical community that there are three main, most cited, and widely referenced trials.

1. Bergvist D et al. Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer. *New England Journal of Medicine.* 2002. 346(13): 975-80
2. Rasmussen MS et al. Prolonged prophylaxis with dalteparin to prevent late thromboembolic complications in patients undergoing major abdominal surgery: a multicenter randomized open-label study. *Journal of Thrombosis and Haemostatis*. 2006. 4: 2384-2390
3. Kakkar VV, Balibrea JL, Martinez-Gonzalez J, Prandoni P. Extended prophylaxis with bemiparin for the prevention of venous thromboembolism after abdominal or pelvic surgery for cancer: the CANBESURE randomized study. *Journal of Thombosis and Haemostasis*. 2010. 8(6): 1223-1229

The below handout provides a short summary and take home points for each of the aforementioned trials. The handout can be disseminated to providers who perform this type of surgery to educate them on the available literature.



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Abdominal/Pelvic Surgery for Cancer: VTE Chemoprophylaxis Evidence

Description: The efficacy and safety of the use of anticoagulants as VTE chemoprophylaxis has been thoroughly and rigorously studied. The three trials below have been widely used and cited in regards to recommending VTE chemoprophylaxis (low-molecular weight heparin) for major abdominal/pelvic surgery for cancer.

Trial 1

Summary: A double-blind, multicenter, randomized trial was conducted to study the optimal duration of postoperative enoxaparin use in regards to venous thromboembolism incidence. Patients undergoing abdominal or pelvic cancer surgery received enoxaparin for 6-10 days postoperatively. After that time period, patients were randomized to be given either a placebo or enoxaparin for 21 more days. 322 patients were included and exhibited significantly different rates of venous thromboembolism in the placebo and enoxaparin groups at 12.0% and 4.8% respectively. Rates of bleeding or other complications were not significantly different between the study groups during the follow-up period.

Takeaway Points: Extended enoxaparin prophylaxis for approximately 27-31 days after an abdominal/pelvic surgery for cancer significantly reduces the risk of venous thromboembolism without increasing the risk of bleeding events or complications as compared to a placebo. [1]

Trial 2

Summary: A blinded, multicenter, randomized trial was conducted to study the efficacy and safety of dalteparin use for 28 days compared to 7 days following surgery. 427 patients undergoing major abdominal surgery for cancer were randomized to receive dalteparin for either 28 days or 7 days postoperatively. The incidence of VTE was significantly reduced in the dalteparin 28 days group vs the dalteparin 7 days group, 7.3% vs 16.3% respectively. The rate of bleeding events did not significantly differ between the two groups.

Takeaway Points: Extended dalteparin use for 28 days after a major abdominal surgery for cancer significantly decreases VTE incidence without increasing the risk of bleeding events.[2]

Trial 3

Summary: A double-blinded, multicenter, randomized trial was conducted to assess the efficacy and safety of bemiparin use for 28 days following surgery. 626 patients undergoing major abdominal/pelvic surgery for cancer were randomized to receive bemiparin for a total of 28 days or bemiparin for 8 days followed by 20 days of placebo. The incidence of VTE was significantly reduced in the long-term (28 days) bemiparin group compared to the short-term (8 days)/placebo group, 2% vs 11% respectively. The rate of major bleeding events did not significantly differ between the two groups.

Takeaway Points: Extended bemiparin use for 28 days after major abdominal/pelvic surgery for cancer significantly decreases VTE incidence without increasing the risk of bleeding events.[3]

[1] Bergvist D et al. Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer. *New England Journal of Medicine.* 2002. 346(13): 975-80
[2] Rasmussen MS et al. Prolonged prophylaxis with dalteparin to prevent late thromboembolic complications in patients undergoing major abdominal surgery: a multicenter randomized open-label study. *Journal of Thrombosis and Haemostatis.* 2006. 4: 2384-2390
[3] Kakkar VV, Balibrea JL, Martinez-Gonzalez J, Prandoni P. Extended prophylaxis with bemiparin for the prevention of venous thromboembolism after abdominal or pelvic surgery for cancer: the CANBESURE randomized study. *Journal of Thombosis and Haemostasis.* 2010. 8(6): 1223-1229

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Total Hip or Knee Arthroplasty

Published clinical trials on VTE chemoprophylaxis use following lower-limb joint replacement demonstrates a decreased risk of VTE with extended VTE chemoprophylaxis use. One study concluded that in patients undergoing hip fracture surgery, the use of fondaparinux for 25-31 days postoperatively significantly reduced the risk of VTE compared to a placebo group that only received fondaparinux for 6-8 days.[18] Kakkar et al. found a significantly lower number of VTE incidences in hip arthroplasty patients who received rivaroxaban for 31-39 days postoperatively (2.0%) compared to patients taking enoxaparin for 10-14 days and a placebo for 31-39 days postoperatively (9.3%).[19] For knee arthroplasty patients, Levine et al. found compared to a placebo, knee arthroplasty patients who received Aredeparin (LMWH) for approximately 14 days following surgery had a significantly decreased relative risk of 49%.[20]

Post-Discharge Prophylaxis – Not Ordered

If your data shows that post-discharge VTE prophylaxis is not being ordered consistently at your institution, then you may want to consider one of the following strategies. Once you've decided which strategy may be most beneficial at your institution, there are multiple interventions to consider.

1. **Patient-Centered Strategies**
    a. Provide an informative handout to patients highlighting the importance of post-discharge VTE prophylaxis. Ideally, provide the handout during the pre-operative clinic visit while having a discussion with the patient on the importance of VTE prevention following surgery both in the hospital and at home.
    b. Present patients with a post-discharge diary that they can fill out each day. The patient can take the completed diary with them to post-operative appointments to discuss any challenges with their provider.
    c. Prescribe post-discharge medications as part of the pre-operative process to provide additional time to resolve any issues (e.g., financial barriers) and also improve patient compliance.
    d. Require that inpatients self-administer some or all post-operative prophylaxis shots under nurse proctorship to improve patient education and compliance following discharge.
    e. Provide patients with materials highlighting any available cost savings programs, rebates, or coupons for medication.
    f. Post-discharge VTE chemoprophylaxis may not be covered by all insurance companies. Provide patients with a list of talking points so they can call the insurance company and appeal the lack of coverage.
2. **Provider (Physician, Nurse, etc.)-Centered Strategies**
    a. Prior to patient discharge, a conversation between the nurse and patient regarding post-discharge VTE prophylaxis can ensure that patients are properly informed and promote synchronization of care. A checklist of items for discussion can be a useful tool to assist the nurse in conducting the discussion.
    b. Post-discharge VTE chemoprophylaxis may not be covered by all insurance companies. Provide physicians and nurses with a list of talking points so they can call the insurance company and advocate for their patient and appeal the lack of coverage. Physicians can

utilize an acceptable medication chart to determine an appropriate substitute medication.

c. Present providers with the benefits of post-discharge VTE prophylaxis in a short and concise presentation. Utilize guidelines and best practices to engage physicians and highlight optimal practices that they can use in their daily practice.

d. Provide surgeons with a report detailing whether or not post-discharge prophylaxis was provided to patients with an appropriate indication.

3. Clinical Decision Support

a. Implement an alert to remind providers to consider post-discharge prophylaxis following abdominal/pelvic surgery for cancer, knee and hip arthroplasty, and surgery for IBD so they order prophylaxis when appropriate.

b. Implement a standardized risk-stratification prophylaxis protocol with electronic alerts to ensure that patients receive optimal post-discharge VTE prophylaxis.

c. Augment an existing order set with an additional reminder to schedule a social worker consultation as part of the post-discharge planning protocol.

4. Strategies for Buy-In

a. If your institution does not have buy-in from leadership to implement a post-discharge prophylaxis intervention, implement a plan to increase buy-in first. A presentation on the benefits of post-discharge prophylaxis can help increase awareness.

5. Audit and Feedback Strategies

a. Have nurses contact the physician if they do not see an order for post-discharge prophylaxis to confirm that there should not be an order in place.

b. Provide a report card to surgeons or front line staff with the rates of post-discharge prophylaxis being ordered.

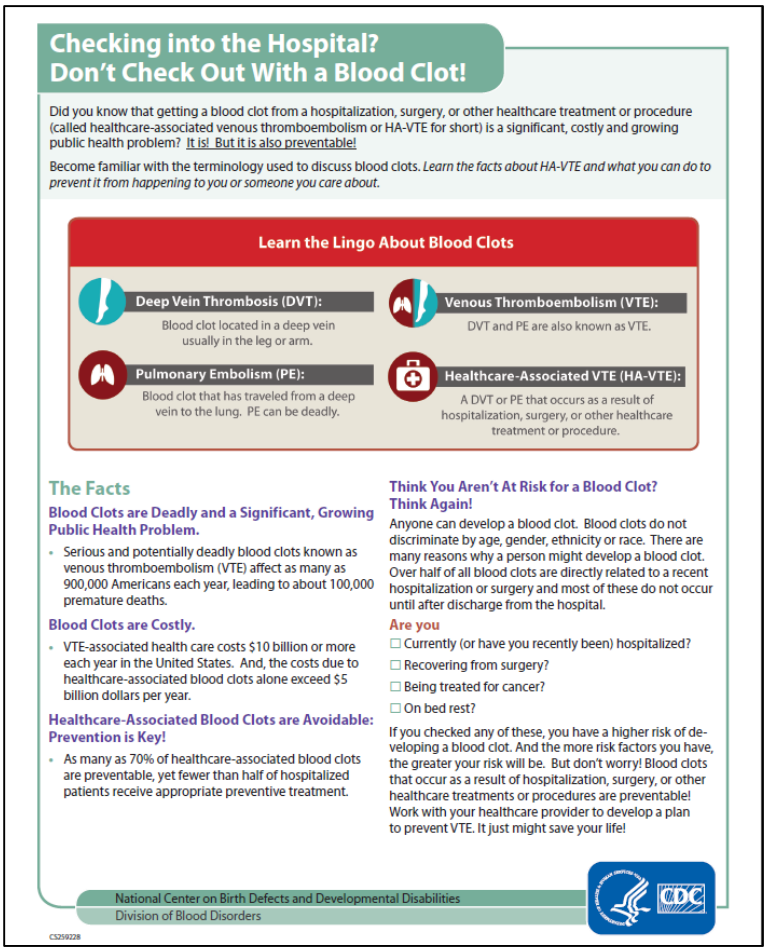
c. Utilize a dashboard to track post-discharge orders at the unit or hospital level in real time to ensure that there aren't any groups that under prescribe post-discharge prophylaxis.

The rest of this chapter will highlight functional examples of each of these strategies.

Patient-Centered Strategies

Patient Education

A variety of patient-centered strategies can be employed to improve patient use of post-discharge VTE prophylaxis. Educating patients on what VTE is, their risk of VTE, and ways to prevent to post-discharge VTE is a vital part of improving adherence to a post-discharge VTE chemoprophylaxis regimen. The CDC developed a blood clot handout, "Checking into the Hospital? Don't Check Out with a Blood Clot!" that can be distributed to patients. In addition to the CDC handout, Johns Hopkins created an informational patient video and handout (available in multiple languages) to increase patient and family engagement in preventing blood clots. Additional patient education materials can be located in Appendix 1.



Checking into the Hospital? Don't Check Out With a Blood Clot!

Did you know that getting a blood clot from a hospitalization, surgery, or other healthcare treatment or procedure (called healthcare-associated venous thromboembolism or HA-VTE for short) is a significant, costly and growing public health problem? It is! But it is also preventable!

Become familiar with the terminology used to discuss blood clots. *Learn the facts about HA-VTE and what you can do to prevent it from happening to you or someone you care about.*

Learn the Lingo About Blood Clots

Deep Vein Thrombosis (DVT): Blood clot located in a deep vein usually in the leg or arm.

Venous Thromboembolism (VTE): DVT and PE are also known as VTE.

Pulmonary Embolism (PE): Blood clot that has traveled from a deep vein to the lung. PE can be deadly.

Healthcare-Associated VTE (HA-VTE): A DVT or PE that occurs as a result of hospitalization, surgery, or other healthcare treatment or procedure.

The Facts

Blood Clots are Deadly and a Significant, Growing Public Health Problem.

- Serious and potentially deadly blood clots known as venous thromboembolism (VTE) affect as many as 900,000 Americans each year, leading to about 100,000 premature deaths.

Blood Clots are Costly.

- VTE-associated health care costs $10 billion or more each year in the United States. And, the costs due to healthcare-associated blood clots alone exceed $5 billion dollars per year.

Healthcare-Associated Blood Clots are Avoidable: Prevention is Key!

- As many as 70% of healthcare-associated blood clots are preventable, yet fewer than half of hospitalized patients receive appropriate preventive treatment.

Think You Aren't At Risk for a Blood Clot? Think Again!

Anyone can develop a blood clot. Blood clots do not discriminate by age, gender, ethnicity or race. There are many reasons why a person might develop a blood clot. Over half of all blood clots are directly related to a recent hospitalization or surgery and most of these do not occur until after discharge from the hospital.

Are you

- ☐ Currently (or have you recently been) hospitalized?
- ☐ Recovering from surgery?
- ☐ Being treated for cancer?
- ☐ On bed rest?

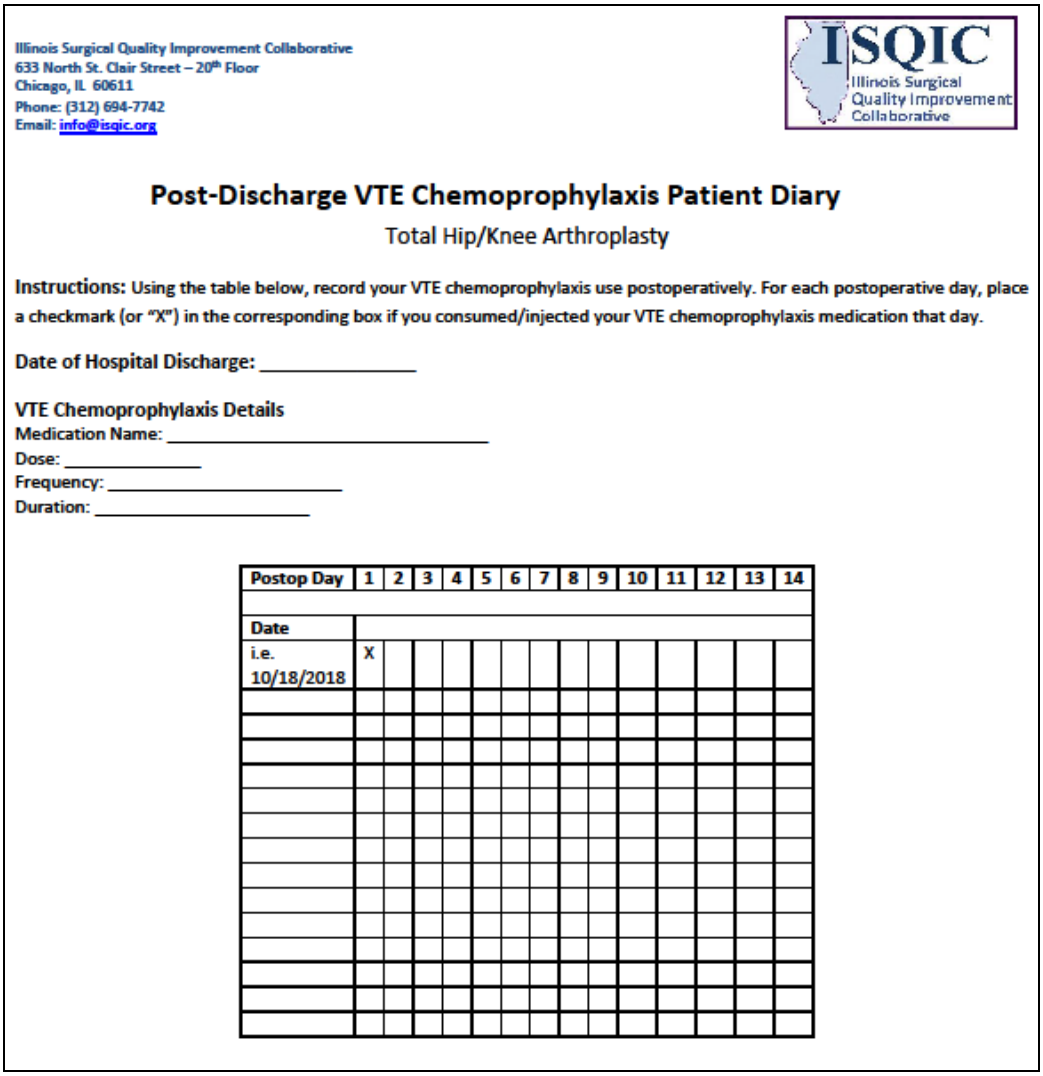
If you checked any of these, you have a higher risk of developing a blood clot. And the more risk factors you have, the greater your risk will be. But don't worry! Blood clots that occur as a result of hospitalization, surgery, or other healthcare treatments or procedures are preventable! Work with your healthcare provider to develop a plan to prevent VTE. It just might save your life!

National Center on Birth Defects and Developmental Disabilities
Division of Blood Disorders

CS259228

Patient Post-Discharge Diary

By providing patients with a "post-discharge chemoprophylaxis diary," patients have a reliable way to track their chemoprophylaxis use at home as well as hold them accountable for taking their chemoprophylaxis. The below post-discharge VTE chemoprophylaxis diaries (Total Hip/Knee Arthroplasty diary and Abdominal/Pelvic Surgery for Cancer or IBD diary) should be printed and given to patients by nurses along with the patient's other discharge paperwork, prescriptions, and medication list during the discharge process. Post-discharge diaries can be brought to postoperative appointments to discuss with their physician. Bergqivist et al. developed a patient diary that can be distributed to patients for completion.[1]



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Post-Discharge VTE Chemoprophylaxis Patient Diary

Total Hip/Knee Arthroplasty

Instructions: Using the table below, record your VTE chemoprophylaxis use postoperatively. For each postoperative day, place a checkmark (or "X") in the corresponding box if you consumed/injected your VTE chemoprophylaxis medication that day.

Date of Hospital Discharge: _____

VTE Chemoprophylaxis Details
Medication Name: _____
Dose: _____
Frequency: _____
Duration: _____

Postop Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Date														
i.e. 10/18/2018	X													

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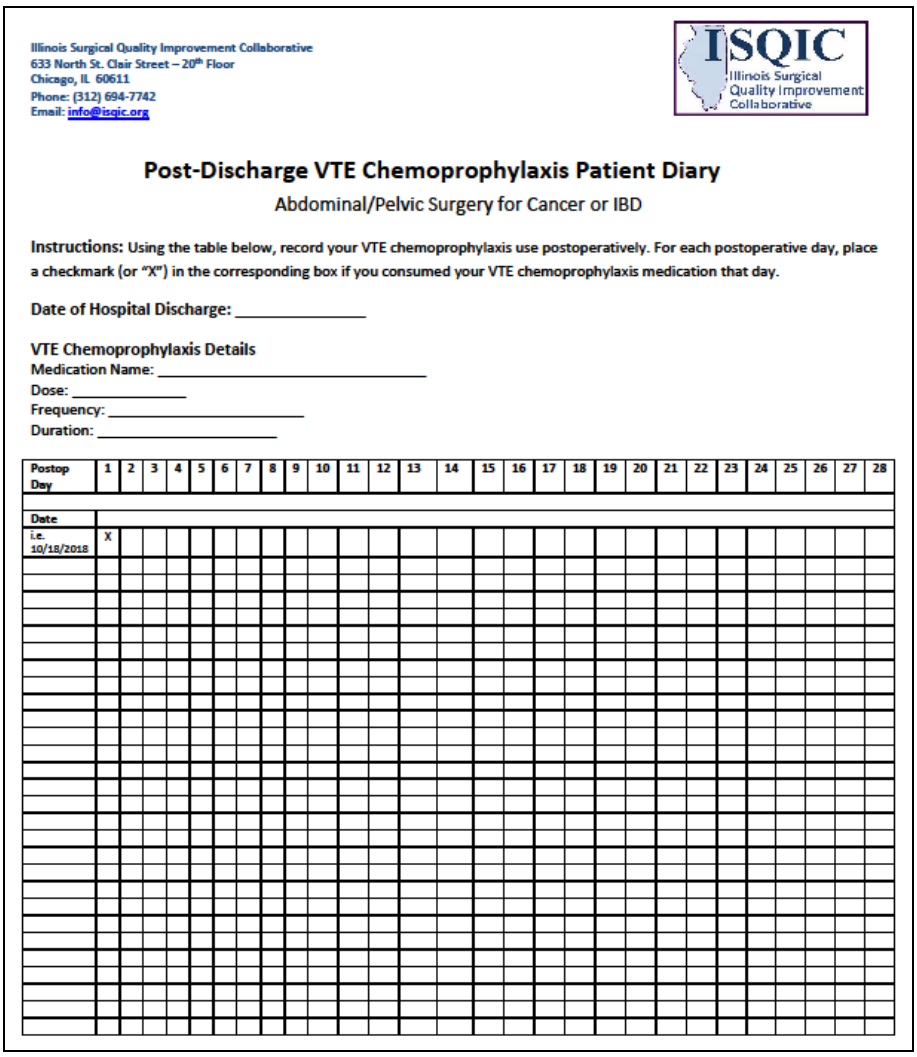

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Post-Discharge VTE Chemoprophylaxis Patient Diary

Abdominal/Pelvic Surgery for Cancer or IBD

Instructions: Using the table below, record your VTE chemoprophylaxis use postoperatively. For each postoperative day, place a checkmark (or "X") in the corresponding box if you consumed your VTE chemoprophylaxis medication that day.

Date of Hospital Discharge: _____

VTE Chemoprophylaxis Details
Medication Name: _____
Dose: _____
Frequency: _____
Duration: _____

Postop Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Date																												
i.e. 10/18/2018	X																											

Double click image to open attachment

Post-discharge VTE Prophylaxis as a Pre-Operative Process

Traditionally, post-discharge prophylaxis medications are provided as part of the discharge process. The process can be rushed since it takes place as the patient is trying to leave or when there are issues with a patient's ability to get the drug. Both can lead to days of not taking the medication as prescribed or to the prophylaxis not being prescribed at all. Switching prescription of the drug to the pre-operative period allows for additional time to resolve any issues (e.g., financial barriers) that a patient may encounter pertaining to getting the drug and can improve compliance.

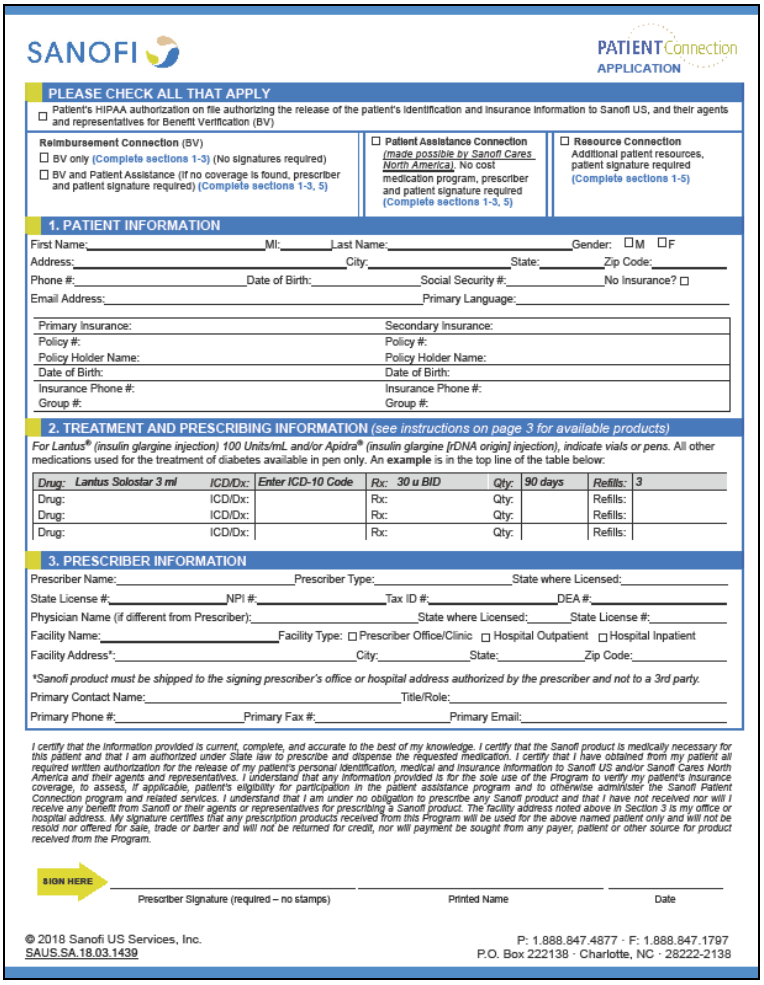
Patient Drug Self-Administration

To improve patient compliance with drug administration after discharge, have patients self-administer some or all post-operative prophylaxis injections under nurse proctorship while the patient has not yet been discharged from the hospital to improve patient education and compliance. Develop a system to document, audit, and track the education and ability of the patient to self-administer the injections.

Patient Programs

Some pharmaceutical companies have programs to assist or fully cover the cost of medications for qualifying patients. To find out if such a program exists for a certain drug, contact the manufacturer to request information on assistance programs.

For example, the maker of Lovenox (enoxaparin), Sanofi, has a program titled the Sanofi Patient Connection (SPC) which provides financial support for some drugs. The below application can be completed by patients to apply for drug replacements including Lovenox.



SANOFI

PATIENT Connection APPLICATION

PLEASE CHECK ALL THAT APPLY

☐ Patient's HIPAA authorization on file authorizing the release of the patient's identification and insurance information to Sanofi US, and their agents and representatives for Benefit Verification (BV)

Reimbursement Connection (BV)
☐ BV only (Complete sections 1-3) (No signatures required)
☐ BV and Patient Assistance (If no coverage is found, prescriber and patient signature required) (Complete sections 1-3, 5)

☐ **Patient Assistance Connection** *(made possible by Sanofi Cares North America)*. No cost medication program, prescriber and patient signature required (Complete sections 1-3, 5)

☐ **Resource Connection** Additional patient resources, patient signature required (Complete sections 1-5)

1. PATIENT INFORMATION

First Name:____ MI:____ Last Name:____ Gender: ☐M ☐F
Address:____ City:____ State:____ Zip Code:____
Phone #:____ Date of Birth:____ Social Security #:____ No Insurance? ☐
Email Address:____ Primary Language:____

Primary Insurance:	Secondary Insurance:
Policy #:	Policy #:
Policy Holder Name:	Policy Holder Name:
Date of Birth:	Date of Birth:
Insurance Phone #:	Insurance Phone #:
Group #:	Group #:

2. TREATMENT AND PRESCRIBING INFORMATION *(see instructions on page 3 for available products)*

For Lantus® (insulin glargine injection) 100 Units/mL and/or Apidra® (insulin glargine [rDNA origin] injection), indicate vials or pens. All other medications used for the treatment of diabetes available in pen only. An **example** is in the top line of the table below:

Drug:	*Lantus Solostar 3 ml*	*ICD/Dx:*	*Enter ICD-10 Code*	*Rx:*	*30 u BID*	*Qty:*	*90 days*	*Refills:*	*3*
Drug:		ICD/Dx:		Rx:		Qty:		Refills:	
Drug:		ICD/Dx:		Rx:		Qty:		Refills:	
Drug:		ICD/Dx:		Rx:		Qty:		Refills:	

3. PRESCRIBER INFORMATION

Prescriber Name:____ Prescriber Type:____ State where Licensed:____
State License #:____ NPI #:____ Tax ID #:____ DEA #:____
Physician Name (if different from Prescriber):____ State where Licensed:____ State License #:____
Facility Name:____ Facility Type: ☐ Prescriber Office/Clinic ☐ Hospital Outpatient ☐ Hospital Inpatient
Facility Address*:____ City:____ State:____ Zip Code:____

**Sanofi product must be shipped to the signing prescriber's office or hospital address authorized by the prescriber and not to a 3rd party.*

Primary Contact Name:____ Title/Role:____
Primary Phone #:____ Primary Fax #:____ Primary Email:____

I certify that the information provided is current, complete, and accurate to the best of my knowledge. I certify that the Sanofi product is medically necessary for this patient and that I am authorized under State law to prescribe and dispense the requested medication. I certify that I have obtained from my patient all required written authorization for the release of my patient's personal identification, medical and insurance information to Sanofi US and/or Sanofi Cares North America and their agents and representatives. I understand that any information provided is for the sole use of the Program to verify my patient's insurance coverage, to assess, if applicable, patient's eligibility for participation in the patient assistance program and to otherwise administer the Sanofi Patient Connection program and related services. I understand that I am under no obligation to prescribe any Sanofi product and that I have not received nor will I receive any benefit from Sanofi or their agents or representatives for prescribing a Sanofi product. The facility address noted above in Section 3 is my office or hospital address. My signature certifies that any prescription products received from this Program will be used for the above named patient only and will not be resold nor offered for sale, trade or barter and will not be returned for credit, nor will payment be sought from any payer, patient or other source for product received from the Program.

SIGN HERE ____ ____ ____
Prescriber Signature (required – no stamps) | Printed Name | Date

P: 1.888.847.4877 · F: 1.888.847.1797
P.O. Box 222138 · Charlotte, NC · 28222-2138

Double click image to open.

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In addition to patient programs, some pharmaceutical companies offer rebates or coupons to decrease the out-of-pocket cost for medications.

Conversations with Insurance Companies

Post-discharge VTE chemoprophylaxis may not be covered by all insurance companies. Provide patients with a list of talking points so they can call the insurance company and appeal the lack of coverage.

An example sheet of talking points is included in Appendix 3.

Provider-Centered Strategies

There are a number of provider (physician, nurse, etc.)-centered strategies that can be employed to improve post-discharge VTE chemoprophylaxis prescribing and usage.

Discharge Planning List

A discharge planning checklist is a helpful tool for nurses to use to ensure all necessary activities are completed and to help guide conversation with patients.

Janssen Pharmaceuticals, Inc. – Discharge Planning Checklist

http://www.janssenpharmaceuticalsinc.com/assets/knee_hip_replacement_discharge_planning_checklist.pdf

Double click image to open attachment

Discharge Planning Checklist

Instructions for healthcare professionals (HCPs): Use this discharge planning checklist prior to discharging patients who have undergone knee or hip replacement surgery to help promote care coordination.[1,2] Many of the areas of discharge noted below are aligned with the National Quality Forum's Preferred Practices and Performance Measures for Measuring and Reporting Care Coordination.

Patient's name: _____ Patient's phone number: _____

Patient's home address: _____

Patient's primary language: _____ Patient's secondary language: _____

Insurance information: _____ Caregiver's name: _____ (if applicable)

Next site of care: _____ Phone number: _____ (if different from address above)

Date of discharge: _____ Allergies: _____

Area of Discharge	Specific Steps	Initial Once Completed
Medication Reconciliation	❍ Discussed, explained, and provided postdischarge medication list (including prescription, OTC, and/or herbal remedies) to patient and/or caregiver	
	❍ Provided postdischarge medication list to next site of care	
	❍ Involved a clinical pharmacist, if necessary	
	❍ Assessed pain upon discharge and modified medication/dosage as needed	
Transition Record	❍ Completed a written transition record/discharge summary according to institution/facility procedures	
	❍ Reconciled transition record/discharge plan with clinical guidelines	
	❍ Provided the written transition record/discharge summary to the patient and/or caregiver within 24 hours of discharge	
Patient Instructions	❍ Provided simple and easy-to-understand instructions in a format written specifically for patients and/or their caregivers; did not use abbreviations (eg, qd)	
	❍ Provided patient instructions in the primary language of patient	
	❍ Documented patient education and understanding of patient instructions	
	❍ Discussed and explained any potential complications of orthopedic surgery, including the signs and symptoms of deep vein thrombosis/pulmonary embolism (DVT/PE) and wound infection	
	❍ Discussed and explained having the patient's home prepared for return	
	❍ Provided a 24/7 telephone support number, if available	
Medication Management	❍ Wrote or called in any new prescriptions, including but not limited to anticoagulant for DVT/PE prophylaxis and analgesic for pain management	
	❍ Confirmed that medications are available at the patient's pharmacy and covered by his or her insurance postdischarge	
	❍ Ensured that patient and/or caregiver understand where to fill new prescriptions	
	❍ Discussed follow-up tests for specific medications, if applicable	
	❍ Discussed the importance of patient adherence to all medication instructions	
Follow-up Care With Healthcare Professionals	❍ Made appointment for patient's follow-up visit with his or her surgeon and any other appropriate HCPs	
	❍ Provided physical therapy prescription to patient and/or caregiver	
	❍ Provided name, address, and phone number of HCP, date and time of appointments, phone number, and reason for visits in written format that is easy to understand for patient and/or caregiver	
	❍ Explained to the patient and/or caregiver that he or she should provide the postdischarge medication list to all HCPs involved in his or her care and recovery plan	

References: 1. National Quality Forum (NQF). *Preferred Practices and Performance Measures for Measuring and Reporting Care Coordination: A Consensus Report*. Washington, DC: NQF; 2010. http://www.qualityforum.org/Publications/2010/10/Preferred_Practices_and_Performance_Measures_for_Measuring_and_Reporting_Care_Coordination.aspx. Accessed June 5, 2013. **2.** Society of Hospital Medicine. Ideal discharge for the elderly patient: a hospitalist checklist [downloadable form]. SHM Web site. http://www.hospitalmedicine.org/AM/Template.cfm?Section=QI_Clinical_Tools&Template=/CM/ContentDisplay.cfm&ContentID=10303. Dated June 2005. Accessed June 5, 2013.

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Conversations with Insurance Companies

Post-discharge VTE chemoprophylaxis may not be covered by all insurance companies. Provide physicians and nurses with a list of talking points so they can call the insurance company and advocate for their patient and appeal the lack of coverage. *An example sheet of talking points is included in the Appendix.*

Some pharmaceutical companies have programs to assist or fully cover the cost of medications for qualifying patients. To find out if such a program exists for a certain drug, contact the manufacturer to request information on assistance programs. For example, the maker of Lovenox (enoxaparin), Sanofi, has a program titled the Sanofi Patient Connection (SPC) which provides financial support for some drugs.

Rebates and Patient Coupons

In addition to patient programs, some pharmaceutical companies offer rebates or coupons to decrease the out-of-pocket cost for medications.

Education

There are undeniable levels of evidence that prescribing anticoagulation medication for VTE chemoprophylaxis after specific surgeries significantly reduces the risk of post-discharge VTE. Use the two resources below to educate physicians on the benefits of prescribing VTE chemoprophylaxis following surgery.

ISQIC Coordinating Center – Benefits of Post-Discharge VTE Prophylaxis PowerPoint Presentation

Double click image to open attachment

VTE Chemoprophylaxis Evidence

The below handout provides a short summary and take home points for each of the highly regarded and cite VTE chemoprophylaxis for abdominal/pelvic surgery for cancer trials. The handout can be disseminated to providers who perform this type of surgery to educate them on the available literature.

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Abdominal/Pelvic Surgery for Cancer: VTE Chemoprophylaxis Evidence

Description: The efficacy and safety of the use of anticoagulants as VTE chemoprophylaxis has been thoroughly and rigorously studied. The three trials below have been widely used and cited in regards to recommending VTE chemoprophylaxis (low-molecular weight heparin) for major abdominal/pelvic surgery for cancer.

Trial 1

Summary: A double-blind, multicenter, randomized trial was conducted to study the optimal duration of postoperative enoxaparin use in regards to venous thromboembolism incidence. Patients undergoing abdominal or pelvic cancer surgery received enoxaparin for 6-10 days postoperatively. After that time period, patients were randomized to be given either a placebo or enoxaparin for 21 more days. 322 patients were included and exhibited significantly different rates of venous thromboembolism in the placebo and enoxaparin groups at 12.0% and 4.8% respectively. Rates of bleeding or other complications were not significantly different between the study groups during the follow-up period.

Takeaway Points: Extended enoxaparin prophylaxis for approximately 27-31 days after an abdominal/pelvic surgery for cancer significantly reduces the risk of venous thromboembolism without increasing the risk of bleeding events or complications as compared to a placebo. [1]

Trial 2

Summary: A blinded, multicenter, randomized trial was conducted to study the efficacy and safety of dalteparin use for 28 days compared to 7 days following surgery. 427 patients undergoing major abdominal surgery for cancer were randomized to receive dalteparin for either 28 days or 7 days postoperatively. The incidence of VTE was significantly reduced in the dalteparin 28 days group vs the dalteparin 7 days group, 7.3% vs 16.3% respectively. The rate of bleeding events did not significantly differ between the two groups.

Takeaway Points: Extended dalteparin use for 28 days after a major abdominal surgery for cancer significantly decreases VTE incidence without increasing the risk of bleeding events.[2]

Trial 3

Summary: A double-blinded, multicenter, randomized trial was conducted to assess the efficacy and safety of bemiparin use for 28 days following surgery. 626 patients undergoing major abdominal/pelvic surgery for cancer were randomized to receive bemiparin for a total of 28 days or bemiparin for 8 days followed by 20 days of placebo. The incidence of VTE was significantly reduced in the long-term (28 days) bemiparin group compared to the short-term (8 days)/placebo group, 2% vs 11% respectively. The rate of major bleeding events did not significantly differ between the two groups.

Takeaway Points: Extended bemiparin use for 28 days after major abdominal/pelvic surgery for cancer significantly decreases VTE incidence without increasing the risk of bleeding events.[3]

[1] Bergqvist D et al. Duration of prophylaxis against venous thromboembolism with enoxaparin after surgery for cancer. *New England Journal of Medicine*. 2002. 346(13): 975-80
[2] Rasmussen MS et al. Prolonged prophylaxis with dalteparin to prevent late thromboembolic complications in patients undergoing major abdominal surgery: a multicenter randomized open-label study. *Journal of Thrombosis and Haemostatis*. 2006. 4: 2384-2390
[3] Kakkar VV, Balibrea JL, Martinez-Gonzalez J, Prandoni P. Extended prophylaxis with bemiparin for the prevention of venous thromboembolism after abdominal or pelvic surgery for cancer: the CANBESURE randomized study. *Journal of Thombosis and Haemostasis*. 2010. 8(6): 1223-1229

Double click image to open attachment

Surgeon-Specific Performance Reporting

Provide a report to surgeons highlighting whether or not post-discharge prophylaxis was ordered for all patients with an appropriate indication. This report can be based off data from electronic medical record alerts or regularly scheduled audits.

Medication Substitutions

If a patient is unable to fill a prescription for a specific medication due to cost and/or insurance challenges, physicians can utilize the below acceptable medication chart to decide on the appropriate substitute medication.

Acceptable Medication List	
Pelvic/Abdominal Surgery for Cancer	**Total Hip and Knee Arthroplasty**
Dalteparin/Fragmin	Dalteparin/Fragmin
Enoxaparin/Lovenox	Enoxaparin/Lovenox
Heparin	Heparin
Warfarin/Coumadin[1]	Warfarin/Coumadin
	Rivaroxaban/Xarelto
	Apixaban/Eliquis
	Fondaparinux/Arixtra
	Dabigatran/Pradaxa
	Aspirin

[1]Coumadin is acceptable for patients with cancer though Low Molecular Weight Heparin is preferred.

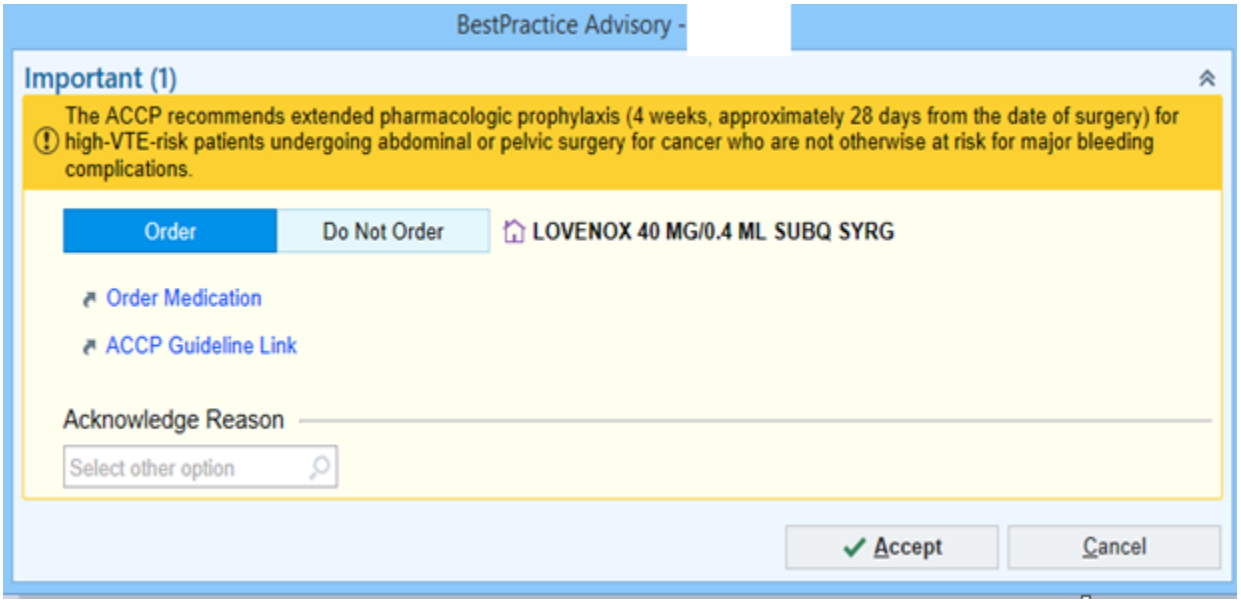
Clinical Decision Support

Clinical decision support (CDS) can be used to reduce the incidence of VTE. An example CDS tool is a Best Practice Alert (BPA) that fires when a certain required best practice event is not completed. For example, the BPA is used to alert providers that they did not prescribe chemical VTE prophylaxis at the time of discharge. Engage your hospital's IT department and/or EMR vendor to explore activating/building CDS within your EMR. In addition to BPAs, building a VTE risk calculator within your hospital's EMR is another type of CDS that may help to reduce the incidence of VTE.

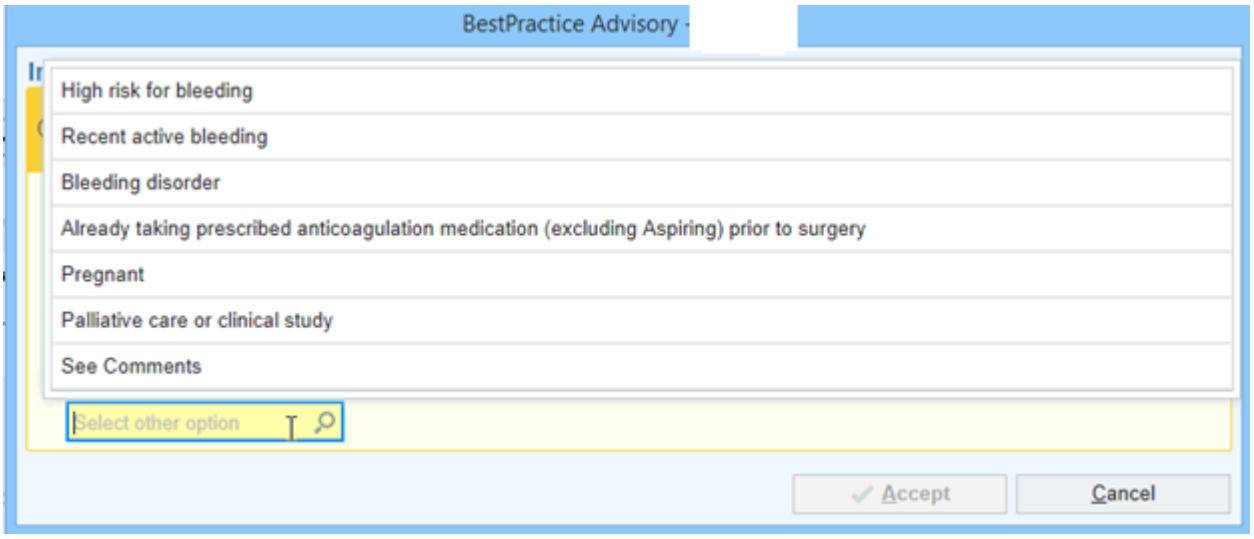
Best Practice Alert (BPA)

The below example alert fires for physicians, advance practice practitioners (APPs), and residents when their patients have had a cancer related abdominal/pelvic surgery and are not being discharged with chemical VTE prophylaxis. The alert will fire if patient has had a surgical procedure that matches one of the qualifying CPT codes (abdominal/pelvic surgery) and ICD-10 diagnosis codes (cancer codes) during the current encounter, has a discharge order signed, and does not have one of the qualifying medications as a home or prescribed medication.

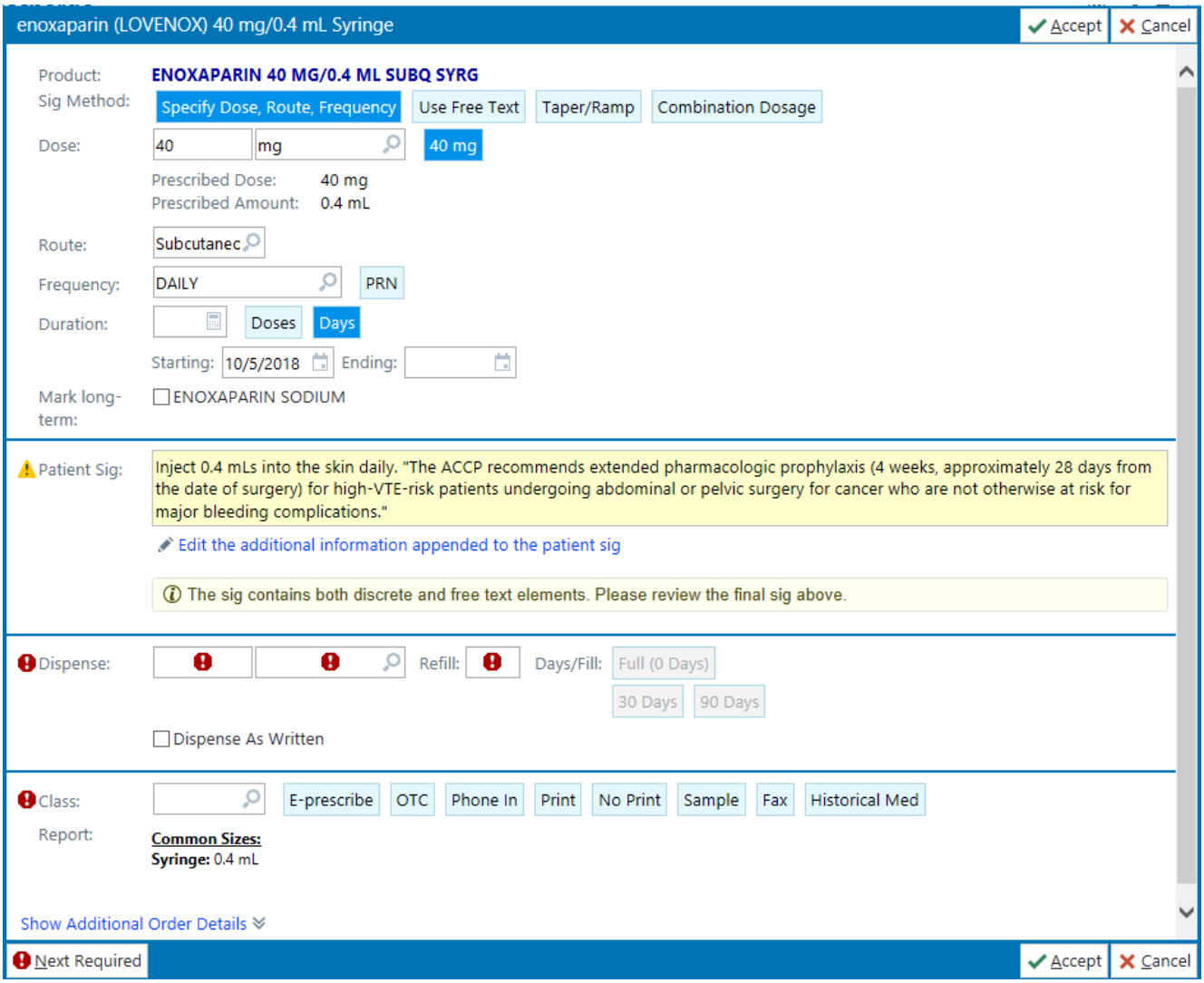
Once the BPA fires, the clinician has the ability to order Lovenox (LMWH) directly from the BPA. The clinician does not have the ability to exit the BPA until either appropriate VTE chemoprophylaxis is ordered or an acceptable exception ("Acknowledge Reason") to ordering VTE chemoprophylaxis (i.e. recent bleeding, pregnant, etc.) is documented.



If an acceptable exception does apply, the clinician can select the appropriate option from the dropdown menu (depicted below) under "Acknowledge Reason".



If the clinician chooses to order Lovenox directly from the BPA, the following screen pops up. This allows for convenient ordering of Lovenox and providers information regarding ACCP prescribing recommendations.



VTE Risk Calculator

By integrating a VTE risk tool (i.e. the Caprini risk assessment) directly into the EMR, risk calculation can be simplified and automated. The University of Michigan (Sections of Vascular and Plastic Surgery), Boston Medical, and Texas Health Resources integrated the Caprini Risk Assessment Model into their hospital EMRs; other hospitals are currently working on this same addition.[21-23]

An example of this is the Boston University School of Medicine and Boston Medical Center Department of Surgery – Standardized Risk-Stratified Prophylaxis Protocol and Mobilization Program.[2]

Table 1. Recommended Prophylaxis Regimens and Duration Based on Caprini Score and Risk Stratification

Caprini score	Risk category	Recommended prophylaxis	Recommended duration of chemoprophylaxis
0	Lowest	Early frequent ambulation only, OR At discretion of surgical team: Compression boots OR Low dose heparin OR Low molecular weight heparin	During hospitalization
1–2	Low	Compression boots OR Low dose heparin OR Low molecular weight heparin (Choose 1 item)	During hospitalization
3–4	Moderate	Compression boots AND Low dose heparin OR Low molecular weight heparin (Choose 1 medication)	During hospitalization
5–8	High	Compression boots AND Low dose heparin OR Low molecular weight heparin (Choose 1 medication)	7–10 days total
>9	Highest	Compression boots AND Low dose heparin OR Low molecular weight heparin (Choose 1 medication)	30 days total

Social Worker Consultation

Augment an existing order set with an additional reminder to schedule a social worker consultation as part of the post-discharge planning protocol.

Strategies for Buy-In

Obtaining buy-in from all necessary stakeholders is an important part of making this effort successful. The below presentation, as well as other resources provided within this toolkit, can be used to help engage integral constituents.

ISQIC Coordinating Center – Benefits of Post-Discharge VTE Prophylaxis PowerPoint Presentation

Double click image to open attachment.

Audit and Feedback Strategies

Confirm Order with Physician

Have nurses contact the physician if they do not see an order for post-discharge VTE prophylaxis to confirm that there should not be an order in place. Track the rates of no order, percentage of times this generated a call (consider generating an automated nursing alert for patients with no post-discharge VTE prophylaxis order), and physician response to the call.

Report Card

Provide a report card to surgeons or front line staff with the rates of post-discharge VTE prophylaxis being ordered and performed. Report cards should be tracked, audited for changes in performance, and fed back to providers.

Track Prophylaxis Orders

Utilize a dashboard to track post-discharge orders at the unit or hospital level in real time to ensure that there aren't any groups that under prescribe post-discharge prophylaxis.

References

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4. Heit JA. Epidemiology of venous thromboembolism. US Department of Health and Human Services' Public Access. 2015;12(8):464-474.

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Appendix

1. Patient Education Materials

a) Janssen Pharmaceuticals, Inc. – Postoperative Follow-Up and Care Brochure
http://www.janssenpharmaceuticalsinc.com/assets/patient_postoperative_follow_up_and_care.pdf

b) Centers for Disease Control and Prevention – Healthcare-Associated Blood Clots: Minimize Your Clots Infographic
https://www.cdc.gov/ncbddd/dvt/materials/infographics.html

2. Insurance Company Discussion Talking Points

Talking Points

- Post-discharge VTE chemoprophylaxis is indicated for 1) abdominal and pelvic surgery for cancer and 2) total hip and knee arthroplasty.
- Chemoprophylaxis after discharge following abdominal and pelvic surgery for cancer is supported by data from a randomized controlled trial as well as The American College of Chest Physicians (ACCP), The American Society of Clinical Oncologists (ASCO), and The National Comprehensive Cancer Network (NCCN). Prophylaxis is generally recommended for 1-4 weeks postoperatively.
- Chemoprophylaxis after discharge following total hip or knee arthroplasty is supported by guidelines from ACCP and The American Academy for Orthopedic Surgeons (AAOS). ACCP recommends a minimum of 10 to 14 days of prophylaxis while AAOS suggests that "In the absence of reliable evidence regarding the duration of prophylactic strategies, it is the opinion of the panel that patients and physicians discuss the duration of prophylaxis."

3. References for Prescribing Post-Discharge Chemoprophylaxis

Abdominal/Pelvic Surgery for Cancer Patients

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