The information contained in this ICSI Health Care Order Set is intended primarily for health professionals and the following expert audiences:

- physicians, nurses, and other health care professional and provider organizations;
- health plans, health systems, health care organizations, hospitals and integrated health care delivery systems;
- medical specialty and professional societies;
- researchers;
- federal, state and local government health care policy makers and specialists; and
- employee benefit managers.

This ICSI Health Care Order Set should not be construed as medical advice or medical opinion related to any specific facts or circumstances. If you are not one of the expert audiences listed above you are urged to consult a health care professional regarding your own situation and any specific medical questions you may have. In addition, you should seek assistance from a health care professional in interpreting this ICSI Health Care Order Set and applying it in your individual case.

This ICSI Health Care Order Set is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. An ICSI Health Care Order Set rarely will establish the only approach to a problem.

Copies of this ICSI Health Care Order Set may be distributed by any organization to the organization's employees but, except as provided below, may not be distributed outside of the organization without the prior written consent of the Institute for Clinical Systems Improvement, Inc. If the organization is a legally constituted medical group, the ICSI Health Care Order Set may be used by the medical group in any of the following ways:

- copies may be provided to anyone involved in the medical group's process for developing and implementing clinical order sets;
- the ICSI Health Care Order Set may be adopted or adapted for use within the medical group only, provided that ICSI receives appropriate attribution on all written or electronic documents; and
- copies may be provided to patients and the clinicians who manage their care, if the ICSI Health Care Order Set is incorporated into the medical group's clinical order set program.
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Foreword

Scope and Target Population

This order set pertains to those orders for venous thromboembolism (VTE) prophylaxis in adults who are medically ill. This order set will not include admission, discharge or other specific orders for the patient's condition outside of VTE prophylaxis.

Clinical Highlights and Recommendations

• All patients should be evaluated for VTE risk upon hospital admission, change in level of care, change in providers and/or upon discharge.
• All patients should receive proper education regarding VTE risk, signs and symptoms of VTE, and prophylaxis methods available.
• Early and frequent ambulation should be encouraged when possible for all patients.
• Aspirin or antiplatelet drugs are not recommended for VTE prophylaxis because other methods are more effective.
• All medically ill patients who have a high risk for VTE should receive anticoagulation prophylaxis, unless contraindicated.
• Risk of VTE development continues beyond hospitalization, and the need for postdischarge anticoagulation should be assessed.

Priority Aims

1. Increase the percentage of hospitalized adult patients (18 years and older) who are appropriately assessed for VTE risk within 24 hours of admission. (JCAHO/CMS Quality Measure)
2. Increase the percentage of patients who are assessed for VTE risk upon change in level of care, change in providers, and upon discharge.
3. Increase the percentage of hospitalized adult patients (18 years and older) who are at risk for VTE who have received education for VTE that includes VTE risk signs and symptoms, and treatment/prophylaxis methods available within 24 hours of admission. (JCAHO/CMS Quality Measure)
4. Increase the percentage of hospitalized adult patients who begin early and frequent ambulation to reduce VTE risk.
5. Increase the percentage of hospitalized adult patients (18 years and older) receiving appropriate prophylaxis treatment within 24 hours of admission. (JCAHO/CMS Quality Measure)
6. Reduce the risk of complications from pharmacologic prophylaxis. (JCAHO/CMS Quality Measure)
7. Increase the percentage of patients discharged on warfarin who have an INR within one week.
Key Implementation Recommendations

The following system changes were identified by the order set work group as key strategies for health care systems to incorporate in support of the implementation of this order set.

1. Medical groups and hospitals are encouraged to develop a formal strategy that addresses the prevention of thromboembolic complications.
   - Develop organization-specific protocols.
   - Develop documents outlining the operational steps taken when formalizing strategies around prevention of thromboembolic complications.

2. Medical groups and hospitals are encouraged to develop systems that support:
   - early identification of patients at risk for VTE development (possibly through use of order sets or similar tools),
   - appropriate prophylaxis initiation (possibly through order sets and/or anticoagulation and ambulation protocols),
   - patient education to include documentation of the patient's own awareness of his/her risk for VTE, signs and symptoms of VTE and when/how to seek treatment, and demonstrated understanding of the prescribed anticoagulation regimen, and
   - early identification of complications (either bleeding or VTE development) in patients.

Related ICSI Scientific Documents

Related Guidelines

- Anticoagulation Therapy Supplement
- Heart Failure in Adults
- Diagnosis and Treatment Chest Pain and Acute Coronary Syndrome (ACS)
- Diagnosis and Initial Treatment of Ischemic Stroke
- Venous Thromboembolism

Order Sets

- Admission for Ischemic Stroke for Patients Not Receiving tPA
- Admission to CCU for Acute Coronary Syndrome
- Admission for Heart Failure
- Discharge for Heart Failure
- ER Orders for Heart Failure
- Preoperative Total Hip and Total Knee Arthroplasty
- Postoperative Total Hip and Total Knee Arthroplasty
- Prevention of Ventilator-Associated Pneumonia
Disclosure of Potential Conflict of Interest

In the interest of full disclosure, ICSI has adopted the policy of revealing relationships work group members have with companies that sell products or services that are relevant to this order set topic. The reader should not assume that these financial interests will have an adverse impact on the content of the order set, but they are noted here to fully inform readers. Readers of the order set may assume that only work group members listed below have potential conflicts of interest to disclose.

Jill Strykowski, R.Ph., MS received honoraria in 2004 from Sanofi Aventis.

Bruce Burnett, MD is a member of the speakers bureau for Aventis, BMS, and Astra Zeneca; a consultant for Aventis, Astra Zeneca, and Glaxo SmithKline; and receives research support from Astra Zeneca.

No work other group members have potential conflicts of interest to disclose.

ICSI’s conflict of interest policy and procedures are available for review on ICSI’s Web site at http://www.icsi.org.

Introduction to ICSI Document Development

Each guideline, order set and protocol is developed by a 6- to 12-member work group that includes physicians, nurses, pharmacists and other health care professionals relevant to the topic, along with an ICSI staff facilitator. Ordinarily, one of the physicians will be the leader. Most work group members are recruited from ICSI member organizations, but if there is expertise not represented by ICSI members, one or two members may be recruited from medical groups or hospitals outside of ICSI.

Prospective work group members are asked to disclose any potential conflicts of interest relevant to the topic of the document; disclosure forms are reviewed for unacceptable conflicts. At the beginning of each work group meeting, the potential conflicts of interest that have been disclosed are reviewed by the work group.

The work group meets for seven to eight three-hour meetings to develop the guideline. A literature search and review is performed and the work group members, under the coordination of the ICSI staff facilitator, develop the algorithm and write the annotations and literature citations.

Once the final draft copy of the guideline is developed, the guideline goes to the ICSI members for critical review.

Review and Comment Process

The purpose of the review and comment process is to provide an opportunity for the clinicians in the member groups to review the science behind the recommendations and focus on the content of the order set. Review and comment also provides an opportunity for clinicians in each group to come to consensus on feedback they wish to give the work group and to consider changes needed across systems in their organization to implement the order set.

All member organizations are encouraged to provide feedback on order sets; however, responding to review and comment is not a criterion for continued membership within ICSI.

After the review and comment period, the work group reconvenes to review the comments and make changes, as appropriate. The work group prepares a written response to all comments.
Approval

Each guideline, order set and protocol is approved by the appropriate steering committee. There is one steering committee each for Respiratory, Cardiovascular, Womens' Health and Preventive Services. The Committee for Evidence-Based Practice approves guidelines, order sets and protocols not associated with a particular category. The steering committees reviews and approves each guideline based on the following:

- Member comments have been addressed reasonably.
- There is consensus among all ICSI member organizations on the content of the document.
- To the extent of the knowledge of the reviewer, the scientific recommendations within the document are current.
- Either a critical review has been carried out, or to the extent of the knowledge of the reviewer, the changes proposed are sufficiently familiar and sufficiently agreed upon by the users that a new round of critical review is not needed.

Once the guideline, order set or protocol has been approved, it is posted on the ICSI Web site and released to members for use. Guidelines, order sets and protocols are reviewed regularly and revised, if warranted.

Document Revision Process

ICSI scientific documents are revised every 12-36 months as indicated by changes in clinical practice and literature. Every six months, ICSI checks with the work group to determine if there have been changes in the literature significant enough to cause the document to be revised earlier than scheduled.

Prior to the work group convening to revise the document, ICSI members are asked to review the document and submit comments. During revision, a literature search of clinical trials, meta-analysis and systematic reviews is performed and reviewed by the work group. The work group meets for one to two three-hour meetings to review the literature, respond to member organization comments, and revise the document as appropriate.

If there are changes or additions to the document that would be unfamiliar or unacceptable to member organizations, it is sent to members to review prior to going to the appropriate steering committee for approval.
Evidence Grading System

A. Primary Reports of New Data Collection:
   Class A: Randomized, controlled trial
   Class B: Cohort study
   Class C: Non-randomized trial with concurrent or historical controls
            Case-control study
            Study of sensitivity and specificity of a diagnostic test
            Population-based descriptive study
   Class D: Cross-sectional study
            Case series
            Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:
   Class M: Meta-analysis
            Systematic review
            Decision analysis
            Cost-effectiveness analysis
   Class R: Consensus statement
            Consensus report
            Narrative review
   Class X: Medical opinion
Order Set

This order set pertains to those orders for venous thromboembolism (VTE) prophylaxis in adults who are medically ill. This order set will not include admission, discharge or other orders specific to the patient’s condition outside of VTE prophylaxis.

Patient Information (two are required)

Last Name: ____________________________
First Name: ____________________________
Date of Birth: __/__/____
Patient’s age: _______
ID #: ____________________________

Legend:
☐ Open boxes are orders that a clinician will need to order by checking the box.
☐ Pre-checked boxes are those orders with strong supporting evidence and/or regulatory requirements that require documentation if not done. (See Annotation #1)

Is patient already on therapeutic anticoagulation? (e.g., warfarin/heparin products – UFH or LMWH)?
Antiplatelet drugs do not apply [e.g., aspirin/clopidogrel])
☐ No ☐ Yes Drug Name: ____________________________

Is drug to be continued? ☐ No ☐ Yes (Additional prophylaxis is not required)

Allergies/Adverse Drug Reactions
☐ None
☐ Yes, Name: ____________________________ Type of reaction: ____________________________

<table>
<thead>
<tr>
<th>VTE Risk Factors</th>
<th>If presence of one or more risk factors, pharmacologic prophylaxis is recommended</th>
</tr>
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<tbody>
<tr>
<td>Prior history of DVT/PE</td>
<td>Acute respiratory failure</td>
</tr>
<tr>
<td>Active cancer or myeloproliferative disorders</td>
<td>Acute infection</td>
</tr>
<tr>
<td>Admission to the ICU</td>
<td>Inflammatory bowel disease</td>
</tr>
<tr>
<td>Extended immobility or estimated length of stay 4 days or more</td>
<td>Nephrotic syndrome</td>
</tr>
<tr>
<td>60 years of age or more</td>
<td>Rheumatoid/Collegen vascular disorder</td>
</tr>
<tr>
<td>Thrombophilia – acquired or congenital</td>
<td>Obesity (BMI greater than or equal to 30)</td>
</tr>
<tr>
<td>Uncompensated heart failure</td>
<td>Other</td>
</tr>
</tbody>
</table>

Anticoagulation Special Circumstances*

<table>
<thead>
<tr>
<th>Delay or withhold anticoagulation until patient has been assessed for risks and benefits of anticoagulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active major, significant bleeding (e.g., cerebral hemorrhage)</td>
</tr>
<tr>
<td>History of HIT (contraindicated for heparin products – UFH, LMWH)</td>
</tr>
<tr>
<td>Thrombocytopenia (less than 50,000 mm3)</td>
</tr>
<tr>
<td>History of coagulopathy (acquired/congenital – e.g., hemophilia, von Willebrand’s, idiopathic thrombocytopenia</td>
</tr>
<tr>
<td>Cranotomy within 2 weeks</td>
</tr>
<tr>
<td>High-risk for re-bleeding including significant hemorrhage, intracranial hemorrhage within the last 2 weeks or subarachnoid hemorrhage until treated and repaired. (Disseminated intravascular coagulation [DIC] hemorrhage due to malignancy does not apply.)</td>
</tr>
</tbody>
</table>

* Consider consultation with an anticoagulation expert to assess risks and benefits of anticoagulation.

Pharmacologic prophylaxis is contraindicated due to: (See mechanical prophylaxis recommendations)
☐
Pharmacologic Prophylaxis
Choose one: (Aspirin or platelet inhibitors are not recommended as monotherapy)

☐ Unfractionated heparin 5,000 units subcutaneous every 8 hours beginning at admission. (Notify physician and discontinue unfractionated heparin if platelet count drops 50% or more from baseline value.)

☐ Dalteparin (Notify physician and discontinue dalteparin if platelet count drops 50% or more from baseline value.)
   ☐ For creatinine clearance greater than or equal to 30 mL/min, 5,000 units subcutaneous every 24 hours beginning at admission
   ☐ For creatinine clearance less than 30 mL/min, _____ units subcutaneous every 24 hours beginning at admission (Consider UFH. Recommend pharmacy to calculate dose.)
   ☐ For renal dialysis patients, _____ units subcutaneously every 24 hours beginning at admission (Consider UFH. Recommend pharmacy to calculate dose.)

☐ Enoxaparin (Notify physician and discontinue enoxaparin if platelet count drops 50% or more from baseline value.)
   ☐ For creatinine clearance greater than or equal to 30 mL/min, 40 mg subcutaneous every 24 hours beginning at admission
   ☐ For creatinine clearance less than 30 mL/min, 30 mg subcutaneous every 24 hours beginning at admission
   ☐ For renal dialysis patients, _____ mg subcutaneous every 24 hours beginning at admission (Consider UFH. Recommend pharmacy to calculate dose.)

☐ Notify physician if bleeding occurs
Obtain orders and initiate the following:
• Platelet count every other day beginning day 2 and discontinue on day 14
• Hemoglobin every other day beginning day 2
• Initiate patient education

Mechanical Prophylaxis
☐ Elastic graded compression knee-high stockings: (Remove twice a day for 30 minutes)
☐ Pneumatic compression: (Recommended if patient is bed-bound or contraindications to pharmacologic prophylaxis)
   ☐ thigh high ☐ knee high

Lab/Diagnostics (Baseline labs if not obtained in the ED or physician office)
☐ Hemoglobin
☐ Platelet count
☐ Creatinine

Authorized Prescriber Signature: ______________________________________

Printed Name: ______________________________________________________

Date/Time of Orders: ____/____/____  ____:______
Annotations

1. Pre-Checked Orders

ICSI order sets utilize two types of boxes for orders. One is the open box that clinicians will need to check for the order to be carried out. The second box is a pre-checked box and are those orders that have strong evidence and/or are standard of care and require documentation if the clinician decides to "uncheck" the order.

There is increasing evidence that pre-checked boxes are more effective in the delivery of care than physician reminders, even within the computerized medical record environment (Dexter, 2004). Organizations are recognizing the benefit of using pre-checked boxes for other orders to promote efficiency. Organizations are encouraged, through a consensus process, to identify those orders to utilize pre-checked boxes to increase efficiency, reduce calls to clinicians, and to reduce barriers for nursing and other professionals to provide care that is within their scope.

*Supporting evidence is class: A*

2. Medications

All patients should be evaluated for risk of VTE at admission, change in level of care, change in providers and upon discharge. Appropriate prophylaxis measures should be initiated for patients deemed to be at risk.

**VTE Pharmacologic Prophylaxis**

In addition to patient education and early frequent ambulation, patients at high risk for VTE development and who do not have contraindications to antithrombotic therapy should receive anticoagulation prophylaxis at admission and continue while risk continues (Mismetti, 2000; Leizorovicz, 2004).

Pharmacologic prophylaxis is not without risk. Patients should be evaluated for an increase risk of bleeding. The following are contraindications for pharmacologic prophylaxis:

- Active major, significant bleeding (e.g., cerebral hemorrhage)
- Thrombocytopenia (platelet count less than 50,000 mm3)
- History of heparin-induced thrombocytopenia (HIT), contraindicated for use of heparins
- Uncontrolled hypertension (systolic greater than 200, diastolic greater than 120)
- Bacterial endocarditis (listed precaution by manufacturer for LMWH)
- Active hepatitis or hepatic insufficiency
- Other conditions that could increase the risk of bleeding

Patients with renal insufficiency (creatinine clearance less than 30 mL/min) should receive a reduced dose.

Obesity is considered an independent risk factor for VTE. Fixed-dose prophylaxis in the severely obese patient will likely result in underdosing; however, weight-based dosing may lead to overdosing because intravascular volume does not have a linear relationship to total body weight. There are a limited number of studies addressing the obesity VTE prophylaxis issue with relatively small numbers. Until further evidence is available, current expert opinion suggests that LMWH thromboprophylactic dosing should be increased by 25% in the very obese patient (e.g., enoxaparin 40 mg every 12 hours).

(Rochat, 2006; Nicolaides, 2006)
Heparin-Induced Thrombocytopenia (HIT)

HIT is an immune-mediated reaction to heparins. It occurs in 2%-3% of patients treated with LDUH and less than 1% of patients treated with LMWH. This syndrome can be associated with paradoxical increased risk for venous and arterial thrombosis. Patients who develop HIT without associated thrombosis will have a significant risk for thrombosis in the subsequent 100 days. Patients with a history of HIT should be not treated with LDUH or LMWH (Warkentin, 2003).

HIT should be suspected in patients who develop a skin lesion reaction at the injection site, have a systemic reaction to a bolus administration of heparin, or develop a greater than 50% decrease in platelet count from baseline labs while on heparin.

Delayed-onset HIT is an increasingly recognized form of this disorder. Patients with delayed-onset HIT typically present with thromboembolic complications one to two weeks (range 5 to 40 days) after receiving their last dose of LMWH or UFH. They frequently display mild or moderate thrombocytopenia. When HIT is not recognized as the etiology of the thromboembolic complication, the patient is frequently rechallenged with heparin, causing significant worsening of the thrombosis, as well as the thrombocytopenia. These patients typically have very high titers of HIT-related antibodies. The possibility of delayed onset HIT should be considered in any patient presenting with thromboembolism after a recent hospitalization. Although in vitro data has not demonstrated cross-reactivity of fondaparinux with HIT antibodies, additional studies are needed before its use can be considered.

Patients suspected of having any form of HIT should have their heparin stopped while antibody testing for HIT is performed. Patients with a high clinical probability of having HIT should be treated with an appropriate alternative anticoagulant before antibody test results are available. Direct thrombin inhibitors (DTIs) are the alternative anticoagulant of choice for patients with HIT. Three brands are FDA approved: lepirudin (Refludan®), argatroban, and most recently, bivalirudin (Angiomax®) (Warkentin, 2003; Warkentin, 2004a; Warkentin, 2004b).

If a patient is receiving warfarin when there is a high clinical probability of HIT, the warfarin should be stopped. The warfarin effect should be reversed with vitamin K, and DTI therapy should be initiated. Low-maintenance doses of warfarin can be restarted during DTI therapy after the platelet count has significantly improved and there is clinical improvement in the patient’s thrombosis. There should be at least a five-day overlap of the DTIs and warfarin. The DTI therapy should be continued until the platelet count stabilizes (Warkentin, 2004b).

Patients with a history of HIT who have a high risk for VTE or who develop HIT while on heparin prophylaxis should be managed by an anticoagulation expert.

VTE Mechanical Prophylaxis

Numerous literature reports strongly suggest that below-the-knee graduated compression stockings are equally effective to thigh-length stockings in DVT prophylaxis; are easier to use, which improves patient compliance; have fewer associated risks and problems; and are more cost effective (Byrne, 2001; Ingram, 2003, Porteous, 1989, Benko, 2001, Agu, 1999, Hameed, 2002).

Correct fitting of knee-length stockings is important to avoid associated complications such as tourniquet effect.
Intermittent pneumatic compression is often not well tolerated by the patient and should be reserved for medical patients who are confined to bed and unable to ambulate or who have contraindications for pharmacologic prophylaxis.

For more information, see the ICSI Venous Thromboembolism Prophylaxis guideline.

*Supporting evidence is of classes: A, D*
Availability of references

References cited are available to ICSI participating member groups on request from the ICSI office. Please fill out the reference request sheet included with your order set and send it to ICSI.

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<td>Mayo Clinic</td>
<td>Aspen Medical Group</td>
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<tr>
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<td>Facilitator</td>
<td>Hospitalist</td>
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<td>ICSI</td>
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<tr>
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<td>HealthEast Care System</td>
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<td>Beverly Christie, RN</td>
<td>Paul Johnson, MD</td>
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<tr>
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<td></td>
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<tr>
<td>Grand Itasca Clinic and Hospital</td>
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</table>

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Brief Description of Evidence Grading

Individual research reports are assigned a letter indicating the class of report based on design type: A, B, C, D, M, R, X.

A full explanation of these designators is found in the Foreword of the order set.
References


Benkő T, Cooke EA, McNally MA, Mollan RAB. Graduated compression stockings: knee length or thigh length. *Clin Orthop Relat Res* 2001;383:197-203. (Class A)

Byrne B. Deep vein thrombosis prophylaxis: the effectiveness of implications of using below-knee or thigh-length graduated compression stockings. *Heart & Lung* 2001;30:277-84. (Class M)


Institute for Clinical Systems Improvement. Anticoagulation Therapy Supplement. April 2005. (Class R)

Institute for Clinical Systems Improvement. Venous Thromboembolism Prophylaxis. June 2005. (Class R)


Warkentin TE. An overview of the heparin-induced thrombocytopenia syndrome. *Semin Thromb Hemost* 2004b;30:273-83. (Class R)


Warkentin TE, Greinacher A. Heparin-induced thrombocytopenia: recognition, treatment and prevention: the seventh ACCP conference on antithrombotic and thrombolytic therapy. *Chest* 2004a;126:311S-37S. (Class R)
This section provides resources, strategies and measurement specifications for use in closing the gap between current clinical practice and the recommendations set forth in the order set.

The subdivisions of this section are:

- Priority Aims and Suggested Measures
  - Measurement Specifications
- Key Implementation Recommendations
- Knowledge Resources
- Resources Available
Priority Aims and Suggested Measures

1. Increase the percentage of hospitalized adult patients (18 years and older) who are assessed for VTE risk within 24 hours of admission.

   Possible measure for accomplishing this aim:
   a. Percentage of hospitalized adult patients (18 years and older) who have a VTE assessment documented in the medical record. *(JCAHO/Draft Quality Measure)*

2. Increase the percentage of patients who are assessed for VTE risk upon change in level of care, change in providers, and/or upon discharge.

   Possible measure for accomplishing this aim:
   a. Percentage of patients upon hospital admission; upon change in level or care and/or upon discharge who have documentation in their medical record that they were evaluated for venous prophylaxis.

3. Increase the percentage of hospitalized adult patients (18 years and older) who are at risk for VTE who have received education for VTE that includes VTE risk, signs and symptoms, and treatment/prophylaxis methods available within 24 hours of admission.

   Possible measure for accomplishing this aim:
   a. Percentage of hospitalized patients who are at risk for VTE who have documented education for VTE education in the medical record.

4. Increase the percentage of hospitalized adult patients (18 years and older) who begin early and frequent ambulation.

   Possible measure for accomplishing this aim:
   a. Percentage of hospitalized patients who have documentation of early and frequent ambulation recorded in the medical record.

5. Increase the percentage of hospitalized adult patients (18 years and older) receiving appropriate prophylaxis treatment within 24 hours of admission.

   Possible measures for accomplishing this aim:
   a. Percentage of medical hospitalized adult patients (18 years and older) with risk for VTE who receive pharmacological prophylaxis treatment, unless contraindicated.
   b. Percentage of medical hospitalized adult patients (18 years and older) with contraindications to pharmacologic prophylaxis in the medical record who receive mechanical prophylaxis.

6. Reduce the risk of complications from pharmacologic prophylaxis.

   a. Percentage of medical hospitalized adult patients (18 years and older) receiving heparin therapy for VTE prophylaxis who have a baseline platelet count before starting heparin, and then a platelet count every other day. *(JCAHO/Draft Quality Measure)*
   b. Percentage of medical hospitalized adult patients (18 years and older) with a creatinine clearance less than 30 mL/min in the medical record who receive a reduce dose of anticoagulation therapy. *(JCAHO/Draft Quality Measure)*
   c. Percentage of medical hospitalized adult patients (18 years and older) who require hospital readmission within 30 days of discharge for conditions related to VTE. *(CMS Quality Measure)*
7. Increase the percentage of patients discharged on warfarin who have an INR within one week.
   
   Possible measure for accomplishing this aim:
   
   a. Percentage of hospitalized patients (18 years and older) who are prescribed warfarin who have an international normalized ration conducted.
Measurement Specifications

Possible Success Measurement # 1a
Percentage of adult hospitalized medical patients who are assessed for VTE risk within 24 hours of admission. (JCAHO/Draft Quality Measure)

Population Definition
Adults 18 and older admitted to the hospital for a medical condition.

Data of Interest
Documentation in chart of patient's VTE risk assessment based on existing risk factors.

Numerator/Denominator Definitions
Numerator: Total number of adult hospitalized medical patients with a completed VTE risk assessment in the medical record.
Denominator: Total number of adult hospitalized medical patients.

Method/Source of Data Collection
From discharge records, a list of all adult hospitalized medical patients during the previous target period. The medical records can be (20-25/month) reviewed to determine the documentation of a completed VTE risk assessment.

Time Frame Pertaining to Data Collection
Data may be collected monthly on a sample of patients for process improvement purposes.

IOM Aims
Safe
Effective
Efficient
Possible Success Measurement #6c

Percentage of adult hospitalized medical patients who require hospital readmission within 30 days of discharge for conditions related to VTE. (CMS Quality Measure)

Population Definition

Adults 18 and older hospitalized for a medical condition.

Data of Interest

Readmission within 30 days of discharge for conditions related to VTE.

Numerator/Denominator Definitions

Numerator: Total number of adult hospitalized medical patients who had a previous admission within the last 30 days for conditions related to VTE.

Denominator: Total number of adult hospitalized medical patients.

Method/Source of Data Collection

A list of all adult hospitalized medical patients during the previous target period. The medical records can be reviewed to determine the documentation of readmission for conditions related to VTE.

Time Frame Pertaining to Data Collection

Data may be collected on a quarterly basis.

IOM Aims

Safe
Effective
Efficient
Timely
Key Implementation Recommendations

The following system changes were identified by the order set work group as key strategies for health care systems to incorporate in support of the implementation of this order set.

1. Medical groups and hospitals are encouraged to develop a formal strategy that addresses the prevention of thromboembolic complications.
   - Develop organization-specific protocols.
   - Develop documents outlining the operational steps taken when formalizing strategies around prevention of thromboembolic complications.

2. Medical groups and hospitals are encouraged to develop systems that support:
   - early identification of patients at risk for VTE development (possibly through use of order sets or similar tools);
   - appropriate prophylaxis initiation (possibly through order sets and/or anticoagulation and ambulation protocols);
   - patient education to include documentation of the patient's own awareness of his/her risk for VTE, signs and symptoms of VTE and when/how to seek treatment, and demonstrated understanding of the prescribed anticoagulation regimen; and
   - early identification of complications (either bleeding or VTE development) in patients.

Knowledge Resources

Criteria for Selecting Resources

The following resources were selected by the Venous Thromboembolism Prophylaxis for the Medically Ill Patient order set work group as additional resources for providers and/or patients. The following criteria were considered in selecting these resources.

- The site contains information specific to the topic of the order set.
- The content is supported by evidence-based research.
- The content includes the source/author and contact information.
- The content clearly states revision dates or the date the information was published.
- The content is clear about potential biases, noting conflict of interest and/or disclaimers as appropriate.

Resources Available to ICSI Members Only

ICSI has a wide variety of knowledge resources that are only available to ICSI members (these are indicated with an asterisk in far left-hand column of the Resources Available table). In addition to the resources listed in the table, ICSI members have access to a broad range of materials including tool kits on CQI processes and Rapid Cycling that can be helpful. To obtain copies of these or other Knowledge Resources, go to http://www.icsi.org/knowledge. To access these materials on the Web site you must be logged in as an ICSI member.

The Knowledge Resources list in the table on the next page that are not reserved for ICSI members are available to the public free-of-charge.
# Resources Available

<table>
<thead>
<tr>
<th>*</th>
<th>Title/Description</th>
<th>Audience</th>
<th>Author/Organization</th>
<th>Web Sites/Order Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anticoagulation Forum</td>
<td>Providers</td>
<td>Anticoagulation Forum</td>
<td><a href="http://www.acforum.org">http://www.acforum.org</a></td>
</tr>
<tr>
<td></td>
<td>The forum is an organization of anticoagulation clinics across the country. The site is useful for finding clinics in other states and professional meetings relevant to anticoagulation.</td>
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<tr>
<td></td>
<td>Joint Commission on Accreditation of Healthcare Organizations</td>
<td>Providers</td>
<td>Joint Commission on Accreditation of Healthcare Organizations</td>
<td><a href="http://www.jcaho.org">http://www.jcaho.org</a></td>
</tr>
<tr>
<td></td>
<td>Web site for Regulatory Standards and Patient Safety Goals</td>
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<tr>
<td></td>
<td>Resource on cardiovascular and respiratory diseases. All information is peer reviewed by a select panel of professionals and lay persons. It includes information specific to antithrombotic therapy.</td>
<td>Providers and Patients</td>
<td>CareInternet</td>
<td><a href="http://www.careinternet.com">http://www.careinternet.com</a></td>
</tr>
<tr>
<td></td>
<td>Deep Vein Thrombosis (DVT)</td>
<td>Providers</td>
<td>Park Nicollet Health Services</td>
<td><a href="http://www.icsi.org/knowledge/cardiovascular">http://www.icsi.org/knowledge/cardiovascular</a></td>
</tr>
<tr>
<td></td>
<td>Single sheet describing importance of diet, helpful hints and when to call the doctor.</td>
<td>Providers</td>
<td>KRAMES Communications 1998</td>
<td><a href="https://shop.krames.com">https://shop.krames.com</a></td>
</tr>
</tbody>
</table>

* Available to ICSI members only.