Health Care Association of NY State
Teamwork-Technique
Achieving Critical Care Excellence
Project:
Thromboembolic Prophylaxis

Jean Fleischman, MD, FCCP
Queens Hospital Center- NYC Health and Hospitals Corporation
Chief, Pulmonary and Critical Care Medicine
Associate Director, Department of Medicine
March 26, 2008
Introduction: The Need for Prevention

- Consequences of deep vein thrombosis (DVT):
  - Life threatening acute pulmonary embolism (PE)
    - PE is the most common preventable cause of death in hospitalized patients
    - 80% of pulmonary emboli occur without prior warning signs or symptoms
    - 2/3 of deaths due to pulmonary emboli occur within 30 minutes of embolization
    - Death due to massive PE is often immediate
    - Routine autopsies finds pulmonary embolism to be a contributing factor in 10 to 25% of deaths.
  - Chronic unresolved pulmonary emboli
    - Chronic pulmonary hypertension
Introduction: The Need for Prevention

- **Deep vein thrombosis (DVT)**
  
is itself a distressing condition that may lead to long-term complications due to valvular damage from proximal vein thrombosis
  
  - Post-phlebitic syndrome
  - Varicose veins
  - Edema
  - Chronic leg ulcers
  - Increased risk of recurrent VTE

At least 90% of pulmonary emboli are thought to originate in major leg veins. This patient underwent a thrombectomy. The thrombus has been laid over the approximate location in the leg veins where it developed.
Why Is It Important to Reconsider Venous Thromboembolism Prophylaxis?

- Cost-effectiveness of prophylaxis has been demonstrated repeatedly.
- Despite strong evidence of the efficacy of prophylactic measures, wide practice variability exists in their implementation.
- Despite strong evidence of efficacy of DVT prophylaxis, wide practice variability exists in implementation.
  - A study of over 200,000 discharges from 227 acute care hospitals between 2002-2005 showed that only 33% of all at risk medical patients received appropriate DVT prophylaxis (Amin, A, et al, Chest 2006; 130:4; 87S)
  - A 2004 registry of 2,726 inpatients with DVT showed that only 42% received prophylaxis within 30 days before diagnosis (J Vasc Surg 2006; 44:789-793)
Why Is It Important to Reconsider Venous Thromboembolism Prophylaxis?

- Most hospitalized patients have risk factors for venous thromboembolism
- The incidence of thromboembolic disease is likely to rise due to increasing patient age and chronicity of comorbid diseases which predispose to thrombosis.
- The Agency for Healthcare Research and Quality 2002 Critical Analysis of Patient Safety Practices:
  - Highest rank safety practice to reduce adverse patient outcomes is “appropriate use of prophylaxis to prevent venous thromboembolism in patients at risk.”
Development of Thromboembolic Task Force

- The NYC Health and Hospitals Corporation (NYCHHC) is comprised of 11 public hospitals in NYC.

- A NYCHHC Quality Assurance Committee recognized the importance of DVT/PE and developed a task force to assess the status of DVT/PE prophylaxis across the Corporation hospitals.
Thromboembolic Task Force: Implementation

- Review of mandatory NY State Patient Occurrence Reporting and Tracking System (NYPORTS) data:
  - A wide variation of rates of DVT/PE across hospitals, among different departments within institutions and between various disease entities was observed.

- Survey of DVT/PE prophylaxis programs across NYCHHC hospitals:
  - Only 2/11 hospitals had formal policies, limited to certain services, regarding DVT/PE prevention
NYPORTS DVT Rate/10,000 Patient Discharges

<table>
<thead>
<tr>
<th></th>
<th>QHC</th>
<th>Coney Island</th>
<th>HHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>15</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>2003</td>
<td>20</td>
<td>30</td>
<td>15</td>
</tr>
</tbody>
</table>
A program was devised to create and implement evidence based standardized strategies to:

- Increase provider knowledge regarding prevention, diagnosis and treatment of thromboembolic disease
- Develop standardized risk assessment and prophylactic recommendation algorithms
- Develop patient education materials and discharge instructions
- Implement a quality assurance tool to monitor adherence to recommendations
Thromboembolic Task Force: Provider Education Program

- A standardized didactic program on DVT and PE prevention was created and distributed to each facility.
- Personnel were designated at each hospital to oversee the mandatory training program in each department.
- Progress reports were forwarded to the task force.
Thromboembolic Task Force: Risk Assessment and Prevention Algorithms

- Standardized risk assessment and prophylactic recommendation algorithms were developed based on a comprehensive literature review.
  - Risk assessment
  - Treatment guidelines
NYC HEALTH AND HOSPITALS CORPORATION

DVT/PE: RISK ASSESSMENT/REASSESSMENT AND TREATMENT PLAN

Initial Assessment Date: __________

1. RISK ASSESSMENT: Each risk factor has a score of one (1) unless otherwise indicated.

   A) AGE (in years): 18-40 (score 0) _______ 41-60 (score 1) _______ 61-70 (score 2) _______ >71 (score 3)_______

   B) PRE-EXISTING CONDITION(S) OR CONDITION(S) DIAGNOSED ON REASSESSMENT:

       | Condition                                      | Score |
       |------------------------------------------------|-------|
       | Previous DVT/PE (score 3)                      |       |
       | Varicose veins, leg edema, stasis, ulcers      |       |
       | Hx of confining travel (car/plane)>6 hrs w/in 1 wk. of admission |       |
       | Hx of immobilization/bed confinement>24hrs     |       |
       | MI                                            |       |
       | CHF                                           |       |
       | CVA                                           |       |
       | Obesity (>20% IBW)                             |       |
       | Acute/chronic respiratory failure             |       |

       | Condition                                      | Score |
       |------------------------------------------------|-------|
       | Inflammatory bowel disease                     |       |
       | Pregnancy or postpartum <1 month               |       |
       | Estrogen hormone Rx (Birth control/HRT)        |       |
       | Hypercoagulable state *                        |       |
       | Malignancy                                     |       |
       | Major infection                                |       |
       | Nephrotic syndrome                             |       |
       | Major trauma (score 3)                         |       |
       | Acute spinal cord injury w/paralysis (score 3) |       |

C) ANTICIPATED IN-HOSPITAL FACTORS:

       | Condition                                      | Score |
       |------------------------------------------------|-------|
       | Anticipated immobilization/bed confinement>24 hrs |       |
       | Indwelling central catheter>72 hrs **           |       |
       | Operative procedure>2 hrs.                     |       |
       | Orthopedics surgery (hip/knee) (score 3)       |       |
       | Major urologic surgery (score 3)               |       |
       | Major gynecologic surgery (score 3)            |       |
       | Neurosurgery (score 3)                         |       |
       | Other major surgery (score 3)                  |       |

D) TOTAL RISK ASSESSMENT SCORE (A+B+C) __________
2. **A) RISK STRATIFICATION LEVELS:**

<table>
<thead>
<tr>
<th>Score</th>
<th>Low Risk</th>
<th>Moderate Risk</th>
<th>High Risk</th>
<th>Very High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Early ambulation or 1. LDUH every 8 hrs 1. LDUH (5000u q 8 hrs &amp; 2 hrs preop) or 1. LMWH or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>or</td>
<td>2. IPC w/ or w/out GCS 2. IPC w/ or w/out GCS or 2. IPC+ heparin (LMWH or LDUH q 8 hrs or</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graduated Compression Stockings (GCS)</td>
<td>3. LMWH</td>
<td>3. Oral anti-coagulation w/ target INR 2-3</td>
<td></td>
</tr>
</tbody>
</table>

**Adapted from ACCP Guidelines**

**B) USE OF PROPHYLACTIC REGIMENS OTHER THAN THOSE OUTLINED IN 2.A SHOULD BE CLINICALLY JUSTIFIED IN THE MEDICAL RECORD.**

*Activated protein C resistance (factor V leiden mutation), Antithrombin III deficiency, protein C or S deficiency, Plasminogen or Plasminogen activator deficiency, Dysfibrinogenemia, Antiphospholipid antibodies or Lupus anticoagulant (3 factors), Non-hemorrhagic myeloproliferative disorders including Polycythemia vera.*

**Femoral, internal jugular, subclavian, peripherally inserted central catheter.**

HHC 2435 (Feb 04)
3. CONTRAINDICATION(S) TO ANTICOAGULATION THERAPY: YES____ NO____ (IF YES, PLEASE CIRCLE LETTER(S) OF THE RELATIVE AND THE ABSOLUTE CONTRAINDICATION(S)).

RELATIVE
A. Hx of cerebral hemorrhage
B. GI, GU blood or stroke w/ in past 6 months
C. Thrombocytopenia
D. Coagulopathy
E. Uncontrolled hypertension
F. Active intracranial lesion/neoplasm
G. Vascular access/biopsy sites inaccessible to hemostatic control

ABSOLUTE
A. Active hemorrhage from wounds, drains, lesions
B. Heparin induced thrombocytopenia
C. Warfarin use in pregnancy
D. Severe trauma w/hemorrhage to head, eyes, spinal cord or extremities w/ in last 4 weeks
E. Spinal tap or epidural anesthesia w/ in 12 hrs
F. Hypersensitivity to LMWH or LDUH
G. Recent eye surgery

4. PLEASE CIRCLE LETTER(S) OF THE MODALITY(IES) CHOSEN:

A. GCS when leg(s) in a dependent position
B. LMWH regimen
C. Heparin regimen: 5,000 units q 8 hrs
D. IPC
E. GCS plus IPC
F. Warfarin regimen
G. Others (specify) ______________________
H. No prophylaxis
I. Suspected DVT, perform diagnostics

5. IN ALL CASES, EARLY AMBULATION AND USE OF INTRAOPERATIVE INTERMITTENT PNEUMATIC COMPRESSION DEVICES ARE RECOMMENDED, UNLESS CONTRAINDICATED.

6. REASSESSMENT TIMEFRAME AND DOCUMENTATION: DOCUMENT RE-ASSESSMENT IN THE MEDICAL RECORD AS PER CLINICAL CONDITION. REVIEW ALL CATEGORIES FROM INITIAL ASSESSMENT, APPLY TOTAL SCORE (A+B+C) TO RISK STRATIFICATION LEVEL AND DETERMINE PROPHYLACTIC REGIMENS.

7. CONTINUATION OF THROMBOEMBOLIC PROPHYLAXIS POST-DISCHARGE SHOULD BE CONSIDERED, IF CLINICALLY INDICATED.

LEGEND:
- DVT - Deep Vein Thrombosis
- IPC - Intermittent Pneumatic Compression
- GCS - Graduated Compression Stocking
- LDUH - Low Dose Un-fractionated Heparin
- HITT - Heparin Induced Thrombocytopenia
- LMWH - Low Molecular Weight Heparin
- IBW - Ideal Body Weight
- PE - Pulmonary Embolism
Patient Education

- A patient education document was developed to describe DVT and its consequences, as well as preventive measures.
- The document was translated into 11 different languages and is available on the HHC Limited English Proficiency (LEP) website.
  - Sixth grade reading level (Flesch-Kincaid grade level)
  - Reviewed by patient education teams in HHC hospitals
  - English, Bengali, Traditional Chinese, French, Haitian-Creole, Hindi, Korean, Polish, Russian, Spanish, Urdu
- The document is recommended for use on admission, in pre-op teaching, ambulatory surgery, any time a patient becomes at risk for DVT.
Who gets deep vein thrombosis?
Your risk of getting a DVT increases if you have certain conditions. Some of these may include:
- you are off your feet more than usual or on bedrest
- you are inactive or sit for long periods of time
- fractures of the hip or leg
- orthopedic or pelvic surgery
- stroke
- congestive heart failure
- varicose veins
- leg swelling
- some cancers
- obesity
- you are going to have a baby and it is the last few months of your pregnancy
- you have just given birth to a baby
- you are on hormone therapy, including birth control pills
- you smoke cigarettes AND have any of these risks

What are the symptoms of DVT?
- swelling in the calf, ankle, foot or thigh
- increased warmth of the leg
- redness
- pain in the leg
- tenderness
- night leg cramps
- bluish color on the skin on the leg or toes

About half of the people with DVT have no symptoms until a clot blocks a major vein.

PATIENT EDUCATION HANDOUT
PREVENTING DEEP VEIN THROMBOSIS

What is a deep vein thrombosis?
A deep vein thrombosis (also called DVT) happens when a blood clot forms in a deep-lying vein, usually in the leg. Such a clot may break loose, travel in your bloodstream and block arteries in your lungs or other parts of the body, causing permanent damage or sometimes death.

How does it happen?
A DVT may happen when your blood moves through deep veins in your legs more slowly than normal, or when there is some thing that makes your blood more likely to clot. When you are moving around less, such as after surgery, or when you sit still for a long period of time, such as during a long plane flight, your blood moves through your veins more slowly. Blood pools in the larger veins of the legs, and clots may form. Injury, major illness and some medicines may also increase the tendency for your blood to clot.

Bedrest can increase your risk for DVT
Because other conditions like inflammation of the veins just under the skin (called phlebitis), muscle strains and skin infections may have symptoms like those of a DVT, it may be hard to diagnose.

**How is it diagnosed?**

You may be asked about your medical history and your symptoms. You may be examined especially if there is anything abnormal, such as a swollen leg. Your legs may be measured to compare sizes on the right and left.

Tests may be needed to be sure there is a DVT. The most common test ordered is the **Doppler Ultrasound**. This test uses sound waves to make pictures. It bounces sound waves off the deep veins in an arm or the leg to find any blockages. It also shows how fast the blood flows through the veins.

**How can DVT be prevented?**

There are ways to help improve blood flow in the veins to help prevent clots from forming.

These may include:

- Moving, getting up, and walking as soon as possible after surgery. Your nurse can assist you with this.
- Physical therapy (special leg exercises).
- Graded compression stockings—these are special stockings ordered by your health care provider which help the blood flow through your veins.
- Intermittent pneumatic leg compression—special sleeves or wraps for your legs that inflate with air and help the blood flow back through your leg veins.
- Medicines that help prevent blood clots, such as Heparin or Coumadin (warfarin).

**How can I help prevent a DVT?**

If you are at risk for having DVT, you can help prevent it from happening by following these guidelines:

- **Avoid sitting for long periods of time.** When you travel, move your feet and legs often. Go for short walks if possible.
- Ask your health care provider about special stockings you can wear to help prevent clots. Make sure you know how to wear them correctly.
- Keep your legs elevated when you are in bed or are sitting down. Leg elevation helps the return of blood through the leg veins.
- **Leg exercises help to prevent pooling of blood in the veins.** If you are unable to exercise, have someone move your legs through some range-of-motion exercises. If you have had major surgery, walking as soon as possible after surgery (with your doctor’s OK) will lower your risk of getting a DVT.
- If you are going to have surgery, ask your surgeon what you can do to help prevent blood clots after surgery.
- **Stop smoking.** Smoking increases your risk for DVT, especially if you have other risk factors as well.
- If you are given medicine to prevent blood clots, learn as much as you can about the medicine, and take it exactly as you are told.

**So, be a partner in your care! Do your part to help prevent DVT—for your health!*
For all patients who received any form of DVT prophylaxis during hospitalization other than early ambulation.
<table>
<thead>
<tr>
<th>EVALUATE CONCURRENTLY FOR QUESTIONS 1 - 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  DVT risk assessment completed on admission (source: risk assessment/reassessment form) □ Yes □ No</td>
</tr>
<tr>
<td>2  DVT risk assessment scores (age, conditions, hospital factors and total score) and risk stratification level documented (source: risk assessment/reassessment form) □ Yes: Score □ No</td>
</tr>
<tr>
<td>3  DVT prophylactic regimen ordered on admission (physician orders) □ Yes □ No</td>
</tr>
<tr>
<td>4a DVT prophylactic order corresponds to the risk stratification level (source: risk assessment/reassessment form and physician orders) □ Yes □ No</td>
</tr>
<tr>
<td>If #4a is 'no' then answer #4b:</td>
</tr>
<tr>
<td>4b If the DVT prophylactic order does not correspond to the risk stratification level, was this due to contraindication to anticoagulation □ Yes □ No</td>
</tr>
<tr>
<td>5  DVT prophylactic regimen implemented (medication administration record, nursing progress notes) □ Yes □ No</td>
</tr>
</tbody>
</table>

**Comments:**

________________________________________________________________________
________________________________________________________________________

Date of Review: _______________________

---

<table>
<thead>
<tr>
<th>EVALUATE RETROSPECTIVELY FOR QUESTIONS 6 - 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>6   Patient education on DVT prophylaxis documented (source: progress note or patient education form) □ Yes □ No</td>
</tr>
<tr>
<td>7   Discharge instructions regarding DVT prevention measures documented (for all patients who received any form of DVT prophylaxis other than early ambulation during hospitalization) (source: progress note or discharge note or discharge summary) □ Yes □ No</td>
</tr>
</tbody>
</table>
Thromboembolic Task Force

- An HHC sponsored CME conference involving major department chairmen (medicine, surgery, orthopedics, ob/gyn, rehabilitation, emergency department), risk managers, administrators and quality assurance representatives was convened to discuss the program.

- The program is now implemented at all 11 hospitals.

- The risk assessment and treatment plan has been integrated into a computerized medical record at most facilities.

- Outcome and Quality Assurance data from each facility are reported to the Task Force on a regular basis.
QHC participated in a Joint Commission sponsored pilot study of quality indicators for DVT risk assessment, prophylaxis, treatment and outcomes.

**Joint Commission Pilot Quality Indicators include:**

- DVT/Risk assessment / prophylaxis within 24 hours of admission
- Outcome of prophylaxis- Assess number of patients diagnosed with DVT during hospitalization, not present at admission **who did not receive prophylaxis (potentially preventable DVTs)**
- Raw data of total number of DVTs was not chosen.
  - This measure is a less useful quality indicator:
    - Affected by changes in clinician awareness/testing frequency (ex: routine screening in asymptomatic pts), diagnosis of acute vs. chronic DVT, as well as severity of underlying illness

- **Current presentation:**
  - Hospital wide quality improvement monitoring for DVT prevention
  - Describe NYPORTs related DVT cases occurring during and after hospitalization at QHC from 2005-2007
  - In patients developing a DVT:
    - Evaluate:
      - Risk assessment on admission
      - Implementation of prophylactic measures
      - Characterize clinical and demographic features to determine if a pattern of clinical features is associated with failure of DVT prophylaxis.
Hospital wide quality improvement monitoring for DVT prevention, 2005-2007

Quality improvement monitoring:
- Monthly random chart reviews across all services
- Reported quarterly to hospital wide QA committee and HHC Task Force

Aggregate Data 2005-2007

<table>
<thead>
<tr>
<th>Quality Indicator</th>
<th>#Completed/ Total cases</th>
<th>% Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVT Risk Assessment completed on admission</td>
<td>872/933</td>
<td>93.5%</td>
</tr>
<tr>
<td>DVT Prophylactic regimen implemented</td>
<td>894/917</td>
<td>97.5%</td>
</tr>
</tbody>
</table>
NYPORTS DVT Cases 2005-2007

QHC Registry

- 47 DVTs at QHC were reported to NYPORTs from 2005-2007

Patient characteristics
- Medical or surgical diagnoses
- Demographics
- Risk assessment and provision of prophylaxis
- Hospital and ICU LOS
- Timing of DVT occurrence
  - During hospitalization
  - Post-hospitalization
- Type of DVT – Lower extremity vs. Upper extremity

<table>
<thead>
<tr>
<th>Year</th>
<th>#DVT cases</th>
<th>Discharges</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>17</td>
<td>16,084</td>
</tr>
<tr>
<td>2006</td>
<td>17</td>
<td>16,438</td>
</tr>
<tr>
<td>2007</td>
<td>13</td>
<td>17,166</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>49,688</td>
</tr>
</tbody>
</table>
DVT Cases 2005-2007
n=47

Service
Med: 40 (85%)
Surg: 7 (15%)
DVT Cases 2005-2007
n=47

Mean Age (yrs)
59 (20-99)

BMI (kg/m2)
28.9 (18-46)

Age Distribution

<table>
<thead>
<tr>
<th>Age Range Years</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-40</td>
<td>6</td>
</tr>
<tr>
<td>41-60</td>
<td>12</td>
</tr>
<tr>
<td>61-80</td>
<td>14</td>
</tr>
<tr>
<td>81-100</td>
<td>10</td>
</tr>
</tbody>
</table>

BMI Distribution

<table>
<thead>
<tr>
<th>BMI kg/m2</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>10</td>
</tr>
<tr>
<td>25-29.9</td>
<td>12</td>
</tr>
<tr>
<td>30-39.9</td>
<td>14</td>
</tr>
<tr>
<td>&gt;40</td>
<td>10</td>
</tr>
</tbody>
</table>

Mean Age (yrs) 59 (20-99)

BMI (kg/m2) 28.9 (18-46)
### DVT Cases 2005-2007

**n=47**

<table>
<thead>
<tr>
<th>Sex</th>
<th>n (%)</th>
<th>Race</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>29 (62%)</td>
<td>Black</td>
<td>31 (66%)</td>
</tr>
<tr>
<td>Females</td>
<td>18 (38%)</td>
<td>White</td>
<td>3 (6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hispanic</td>
<td>5 (11%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asian</td>
<td>8 (17%)</td>
</tr>
</tbody>
</table>

36/47 (76.6%) patients were assessed as High Risk Category for DVTs (multiple risk factors)
DVT Cases 2005-2007

n=47

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metastatic Carcinoma</td>
<td>15 (32%)</td>
</tr>
<tr>
<td>ESRD</td>
<td>10 (21%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>11 (23%)</td>
</tr>
<tr>
<td>CHF</td>
<td>4 (8%)</td>
</tr>
<tr>
<td>Others</td>
<td>8 (16%)</td>
</tr>
</tbody>
</table>

Some patients had multiple diagnoses
A 2004 registry of 2,726 inpatients with DVT showed that only 42% received prophylaxis within 30 days.

### DVT Risk Assessment within 24 hrs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>45 (96%)</td>
</tr>
<tr>
<td>No</td>
<td>2 (4%)</td>
</tr>
</tbody>
</table>

### Appropriate DVT Prophylaxis Administered

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42 (89%)</td>
</tr>
<tr>
<td>No</td>
<td>5 (11%)</td>
</tr>
</tbody>
</table>
## DVT Cases 2005-2007

*n=47*

<table>
<thead>
<tr>
<th>LOS days (range)</th>
<th>ICU LOS days (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.9 (1-58)</td>
<td>10.2 (2-29)</td>
</tr>
</tbody>
</table>

42.6% in ICU

<table>
<thead>
<tr>
<th>Hospital Day of DVT</th>
<th>Day of DVT after discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.3 (3-45)</td>
<td>12.4 (3-30)</td>
</tr>
</tbody>
</table>

51% in hospital DVT 49% after discharge DVTs
**DVT Cases 2005-2007**

*n=47*

- 9/47 (19%) were upper extremity DVTs
  - 4 ESRD
  - 3 Metastatic Carcinoma
  - 2 HIV
  - 1 CHF, CRI
  - 1 CVA, DM

- 1 pt had ESRD, HIV and Carcinoma
Summary and Discussion

- Hospital wide compliance with DVT risk assessment (93.5%) and administration of DVT prophylaxis (97.5%) was excellent.
- 89% of patients who developed DVTs had received appropriate prophylaxis - failure of prophylactic therapy.
- DVT cases were broadly distributed in age and BMI although mean BMI was 28.9 kg/m² (overweight).
- 85% were medical service patients, 15% surgical service.
- 77% of patients had multiple DVT risk factors - high risk category.
- Most frequent diagnostic categories were metastatic carcinoma (32%), ESRD (21%) and diabetes (23%).
Summary and Discussion

- DVT patients had high LOS (18.9 days)
- In hospital occurring DVTs developed late (day 16)
- 51% occurred during hospitalization
- 49% occurred after discharge (12.4 days post discharge)
- 19% were upper extremity DVT’s
Recent meta analysis of anticoagulant prophylactic therapy for DVTs in hospitalized medical patients showed:

- Anticoagulant prophylactic treatment reduced risk for symptomatic DVT by 53%
- Optimal duration of treatment is uncertain (no evidence based recommendations for medical pts post-discharge, trials are ongoing)
  - 54% of our cases occurred post-discharge

Summary and Discussion

- Critically ill patients:
  - Preferred route of administration of prophylactic anticoagulation is not clear
  - Low molecular weight heparin may be more effective than unfractionated heparin in reducing risk of VTE [McGarry, LJ, et al, Outcomes of Thromboprophylaxis with Enoxaparin vs Unfractionated Heparin in Medical Inpatients. Thromb J 2006;4:17]
Recommendations

- **Improve rates of provision of prophylactic therapy**
  - Mandatory electronic DVT risk assessments to be implemented along with inpatient EMR

- **Development of evidence based recommendations for duration of prophylaxis after discharge for medical patients**

- **Future research to improve prophylactic regimens**
  - Direct factor Xa inhibitor anticoagulants

- **Better detection/individual profiling of hypercoaguable states**

- **Targeted early ambulation**