VTE Prevention in the Emergency Department Setting

Dr John Sammut
Clinical Advisor
The Clinical Excellence Commission
Senior Emergency Physician
Concord Emergency Department
Director HDU and Clinical Executive Director
Canterbury Hospital
The Impact

**July 2011:**

- 59 year old female slipped while shopping and injured her knee; BIBA to hospital:
  - Past Hx: morbid obesity
  - History: Pain the knee, unable to weight bear with restricted left knee movement
  - O/E: Swollen knee, unable to flex (Closed injury)
VTE Prevention in the Emergency Department

• **X-ray:** non-displaced fracture of proximal tibia

• **Plan:**
  – Pain relief
  – Zimmer splint in full extension
  – Specialist follow-up 7/7
  – Discharged home into the care of her daughter
VTE Prevention in the Emergency Department

During the week at home:

– C/o pain in L shin
– Then on day 7: experienced sudden, extreme SOB
– Ambulance called, but on arrival: she arrested and died on scene.
Coronial Inquest into the deaths of JC and HI, November 2012:

Coroner noted:

“.....deceased was grossly obese and together with immobility was at a significant risk for a DVT. No DVT prophylaxis was given. ......post-mortem showed a large PE”
Expert evidence given during the coronial review:

“...the simple exercise of not admitting such patients to Hospital (and managing the patients at home)....does not really make them significantly less likely to suffer vein thrombosis”
Coronial Inquest into the deaths of JC and HI, November 2012

Coronial recommendations included:

“....Consideration be given to.....

Creation of policy/guideline that addresses the need for patients with a lower leg fracture treated in the Emergency Department of a Hospital to be assessed, and if appropriate treated for the risk of VTE....”
The Impact

What has happened since that time?

April 2014:
37 year old women presented to ED following a fall at work.
X-ray revealed fractured distal fibula
Management plan:
- Pain relief
- Non-weight bearing back slab
- Follow-up appointment with an orthopaedic specialist in 2 weeks
11 days post injury the women’s daughter called an ambulance after finding her mother collapsed at home....
Rushed to the ED extremely SOB with chest pain:

A CT pulmonary angiogram revealed extensive bilateral pulmonary emboli.

Despite attempts to thrombolyse and resucitate the patient, she died later the same day.
One is left to wonder about:

• Number of unattributed fatalities in the community that go unreported and the

• Morbidity burden (e.g.: chronic venous insufficiency post DVT not detected).....
Current Practice

What we do know is:

Patients discharged from ED are *not routinely assessed* for VTE or prescribed prophylaxis where indicated.
So why should things change?

What is the evidence to support a change in practice in the ED setting?
2 recent sources of evidence for change:

**The Cochrane Review 2012** *(republished in 2014: with no change)*

- LMWH for prevention of venous thromboembolism in patients with lower-leg immobilization

**College of EM (UK) : GEMNet Oct 2012**

- Guideline for the Use of Thromboprophylaxis in ambulatory trauma patients requiring temporary limb immobilisation
Low molecular weight heparin for prevention of venous thromboembolism in patients with lower-leg immobilization (Review)

Testroote M, Stigter WAH, Janssen L, Janzing HMJ

THE COCHRANE COLLABORATION®

WILEY
Objectives

• To assess the effectiveness of low molecular weight heparin for the prevention of venous thromboembolism in patients with lower-leg immobilization (by plaster cast or brace) in an ambulant setting.

*Included six RCTs with a total of 1490 patients*
• We found an incidence of VTE ranging from 4.3% to 40% in patients who had a leg injury that had been immobilized in a plaster cast or a brace for at least one week and who received no prophylaxis, or placebo.
• The incidence was *significantly lower* in patients who received daily subcutaneous injections of LMWH during immobilization.
These comparable results were seen in the following subcategories:

- patients with fractures,
- patients with soft-tissue injuries,
- patients with below-knee casts.
When reviewing the balance of risk – benefit

Complications of major bleeding events were extremely rare (0.3%) and there were no reports of heparin-induced thrombocytopenia.
Authors’ conclusions

• Use of LMWH in outpatients significantly reduces VTE when immobilization of the lower leg is required.

• It should not only be considered in patients with an above-knee cast but also in patients with a below-knee cast.

LMWH can safely be used for this indication.
• Incidence of VTE after temporary plaster immobilisation is approximately 11 %
• This is compared to an annual VTE incidence of 0.12-0.18% in a normal undifferentiated population.

And therefore it can be seen that temporary plaster immobilisation of the lower limb is a significant risk factor for VTE
The College of Emergency Medicine, UK

- Prophylaxis is commonplace in some European countries, (being recommended in national guidance from both the French and German Medical Societies).
- BUT UK and American practice does not mirror that seen within Europe..
WHY?

In the UK setting they noted barriers that included:

– An absence of clear guidelines
– Lack of consensus around the need for such a guideline and the
– Failure to recognise VTE as significant problem in patient cohort
Conclusion:

“......Compelling evidence a substantial risk and the need for change....”
Recommendations

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of VTE in upper limb immobilisation</td>
<td>Grade C</td>
</tr>
<tr>
<td>There is no evidence to suggest significant risk of VTE in ambulatory patient with isolated injury and temporary upper limb immobilisation</td>
<td></td>
</tr>
<tr>
<td>Risk of VTE in lower limb immobilisation</td>
<td>Grade A</td>
</tr>
<tr>
<td>There is reasonable evidence to suggest a significant risk of VTE in ambulatory patients with isolated injury and subsequent temporary lower limb immobilisation</td>
<td></td>
</tr>
</tbody>
</table>
Recommendations

• Ambulatory patients with LL immobilisation and any of the following risk factors should be considered to be at increased risk of VTE:
  – Rigid immobilisation
  – Non-weight bearing status
  – Acute severe injury (dislocation, fracture or complete tendon rupture)
Evidence-based Algorithm for the assessment and management of patients in the ED
LL immobilisation, (be it rigid, non weight bearing or assoc. with acute severe injury), coupled with ANY additional risk:

**CDU/02: DOES ANY PERMANENT RISK OF VTE EXIST? (ANY YES)**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current hormone therapy (COC, HRT, Tamoxifen)</td>
<td></td>
</tr>
<tr>
<td>Personal or first degree relative VTE history</td>
<td></td>
</tr>
<tr>
<td>Active smoker</td>
<td></td>
</tr>
<tr>
<td>Any recent hospital admission / major surgery</td>
<td></td>
</tr>
<tr>
<td>Pregnant or immediately post-partum</td>
<td></td>
</tr>
<tr>
<td>Any serious medical comorbidity including cardiac failure/COPD/chronic renal failure or inflammatory bowel disease</td>
<td></td>
</tr>
<tr>
<td>Extensive varicosities</td>
<td></td>
</tr>
<tr>
<td>Active cancer</td>
<td></td>
</tr>
<tr>
<td>Obesity (BMI &gt; 30)</td>
<td></td>
</tr>
<tr>
<td>Known thrombophilia</td>
<td></td>
</tr>
<tr>
<td>Age &gt; 60 years</td>
<td></td>
</tr>
</tbody>
</table>
And no contraindication:

<table>
<thead>
<tr>
<th>CDU/03: ANY RELATIVE CONTRAINDICATION TO LMWH? (ANY YES)</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemophilia / other haemorrhagic disorder</td>
<td>Yes</td>
</tr>
<tr>
<td>Thrombocytopenia or previous Heparin induced Thrombocytopenia</td>
<td>Yes</td>
</tr>
<tr>
<td>Recent cerebral haemorrhage or severe hypertension</td>
<td>Yes</td>
</tr>
<tr>
<td>Active peptic ulcer / recent gastrointestinal bleeding</td>
<td>Yes</td>
</tr>
<tr>
<td>Recent major trauma / surgery to eye or nervous system</td>
<td>Yes</td>
</tr>
<tr>
<td>Hypersensitivity to any form of heparin</td>
<td>Yes</td>
</tr>
<tr>
<td>Known estimated GFR &lt;30ml/min</td>
<td>Yes</td>
</tr>
<tr>
<td>Risk deemed to outweigh benefits by clinician</td>
<td>Yes</td>
</tr>
</tbody>
</table>

indicates the **need for prophylaxis**
The NSW Context
Revised Policy Directive: 

The Emergency setting

• “...Adult patients to be discharged home from an ED who........ have significantly reduced mobility relative to normal state, should undergo VTE risk assessment and be prescribed appropriate prophylaxis by an ED clinician prior to leaving the ED...”
The Way Forward For Emergency Department Practice:

We need to establish a working party with representatives from:

- CEC
- ACI/ECI
- Lead Clinicians: -
  - Emergency Medicine
  - Haematology
  - Other interest groups

To drive this change
Address the Challenges:

• The need to **develop a dedicated risk assessment tool** for the ED, clearly outlining the indications and contraindications to therapy
• The need to **determine the process** by which we will **change culture and practice** to improve performance in this area.
Stop Clots, Stop Harm
Thank you

For further information:

stopclots@cec.health.nsw.gov.au
www.cec.health.nsw.gov.au