Venous Thromboembolism (VTE)
Reducing the Risk in Maternity Patients

[insert presenter’s name]
[insert presenter’s position]
[insert the presenter’s facility]
Objectives

• Provide an introduction to venous thromboembolism (VTE)
• Discuss how VTE affects maternity patients
• Identify which maternity patients require assessment
• Provide an overview of VTE Risk Assessment with regards to:
  – Using the Maternity VTE Risk Assessment Tool
  – Factors to consider when performing VTE risk assessments
• Practise performing VTE Risk Assessments
Venous Thromboembolism (VTE)

<table>
<thead>
<tr>
<th>VTE</th>
<th>Deep Vein Thrombosis (DVT)</th>
<th>Pulmonary Embolism (PE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurs</td>
<td>Occurs in deep veins (most commonly in legs and groin)</td>
<td>Occurs after DVT dislodges and travels to the lungs</td>
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<tr>
<td></td>
<td>Can cause long-term issues – ‘post-thrombotic syndrome’ (PTS). PTS affects 23-60% of DVT patients within 2 years</td>
<td>Serious complication which can lead to death</td>
</tr>
<tr>
<td>Lower-extremity DVT has 3% PE-related mortality rate</td>
<td>Patients with PE have 30-60% chance of dying from it</td>
<td></td>
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</table>
What causes VTE?

Virchow’s Triad = categories of factors contributing to blood clot formation

- **Stasis**: Alteration in normal blood flow
- **Endothelial Injury**: Injury or trauma to the inside of the blood vessel
- **Hypercoagulability**: Alteration in the constitution of blood causing blood to clot more easily
What’s the Harm?

VTE

Mortality

Fatal PE

Morbidity

Readmission
 Increased Length Of Stay
 Post-thrombotic syndrome

Increased Length Of Stay
Post-thrombotic syndrome
The Impact of VTE

- More than 14,000 Australians develop a VTE per year
- More than 5,000 of them will die as a direct result

- VTE causes 7% of all hospital deaths
- Incidence 100 times greater in hospitalised patients than community residents
- Largely preventable
The VTE Prevention Program: A State Perspective

Guidelines
- VTE Prevention Framework
- Revised Policy Directive

Tools
- VTE Risk Assessment Tool
- Electronic support through eMR
- Audit / performance monitoring tool
- Non-fatal VTE Incident Management Tool
- Revised NIMC with dedicated VTE section

Education and Raising Awareness
- eLearning module for clinicians
- Educational resources for clinician training
- Patient education material
- Posters focused on patients, and clinicians
# Framework for the Prevention of Venous Thromboembolism

This Framework has been developed to guide LHDs and facilities in the implementation of the Prevention of Venous Thromboembolism Policy Directive.

<table>
<thead>
<tr>
<th>To Prevent VTE</th>
<th>What this means for Patients</th>
<th>Actions Required by NSW Hospitals and Health Services</th>
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</table>
| Identify Patients | Patients with a potential to be at risk of VTE are identified | 1.1 All patients admitted to a ward or unit will undergo VTE risk assessment  
1.2 All patients discharged from Emergency Departments with significantly reduced mobility relative to normal state will undergo VTE risk assessment  
1.3 All pregnant and postpartum women will be referred to an Obstetrics consultant/lead to undergo appropriate VTE risk assessment |
| Prescribe Appropriate Prophylaxis | Treatment is based on the clinical knowledge and evidence  
Prescribed prophylaxis is documented and easily accessible by healthcare providers | 2.1 VTE risk assessments are completed within 24 hours of patient admission  
2.2 A standardised, approved risk assessment tool should be made available to all clinical staff  
2.3 The risk assessment tool enables clinicians to weigh the risk of bleeding against the risk of VTE  
2.4 Outcome of the risk assessment is clearly documented in an approved record such as: 
(i) National Inpatient Medication Chart (NIMC)  
(ii) Patient health care record  
(iii) Approved risk assessment tool  
(iv) Other locally approved form |
| Engage the Patient | Patients/caregivers are informed of VTE risks and treatment options  
Patients/caregivers are involved in treatment planning | 3.1 Clinical decision support is available for all clinicians, and encouraged review of risk vs. benefit of prophylactic treatment  
3.2 Clinical decision support is to be based on evidence-based guidelines  
3.4 Where the regular NIMC is used, prescribing of both pharmacological and mechanical prophylaxis is completed in the dedicated VTE section |
| Reassess | Patients are regularly assessed for VTE throughout admission  
Prevention of VTE continues if discharge is required | 4.1 Patients/caregivers are informed of VTE risks and treatment options  
4.2 Patients/caregivers are involved in treatment planning  
4.3 A standardised patient information leaflet is available for clinicians to provide to patients  
5.1 VTE risk is reassessed regularly (at least every 7 days) or as clinical condition changes  
5.2 Clinicians are prompted at discharge to assess the need of prolonged prophylaxis |
| Monitor Practice | Hospitals monitor performance and strive to improve processes  
Health professionals are updated and aware of requirements | 6.1 Rates of risk assessment completion are audited periodically (at least annually, or more frequently if compliance is poor)  
6.2 Rates of provision of appropriate prophylaxis are audited periodically  
6.3 Results of audit and review are reported to clinicians to drive change  
6.4 Clinicians are educated on the need for VTE prevention measures |
What Patients are Involved?

- Adult Inpatients
- Maternity Patients
- Patients Discharged from ED with Lower Limb Immobilisation
- Day Surgery Patients
- Stroke Patients

VTE Prevention – e solution
So how does VTE affect maternity patients?
Of the 49 direct causes of maternal death identified in Australia between 2008-2012, which leading two accounted for almost 43% of direct deaths?

- Obstetric haemorrhage
- Thromboembolism
VTE and Pregnancy

• Identified as a direct cause of maternal death accounting for 3.2% of deaths worldwide


• Also found to be one of the leading causes of direct maternal death in Australia (2008-2012) accounting for 9.5% of deaths

Figure 3.3: Causes of maternal deaths, per cent, Australia, 2008–2012

What’s the Harm? Case ONE

• 28 year old presented at 34 weeks
• Underwent emergency LSCS for placental abruption
• Hx indicates previous DVT post-op requiring 3 month warfarin therapy
• Prescribed Clexane 40mg post-LCSC
• Ceased Day 4
What’s the Harm? Case ONE

• Represented 28 days post-partum with significant pain and swelling of calf
• U/S confirmed 3.5cm DVT in soleal sinus
• Commenced on treatment dose of anticoagulant for 6 months
What’s the Harm? Case TWO

• 32 year old presented at 40+1 weeks
• Fully dilated
• Rapid NVB, nil complications
• Hx notes BMI = 42, family history of PE
• Nil VTE Risk Assessment completed
• Discharged 3/7 post-partum
What’s the Harm? Case TWO

• 10 days post-partum found collapsed at home
• Paramedics called and transported patient to hospital
• Dead on arrival
• Post-mortem findings: Extensive pulmonary embolism
Completing a VTE risk assessment and prescribing appropriate prophylaxis can save a mother’s life
The prevention of Venous Thromboembolism Policy Directive (PD2014_032) states that:

- All pregnant and post-partum women must undergo VTE risk assessment:
  - During the first antenatal review and/or booking
  - During admission into a non-obstetric setting for a non-pregnancy related complaint
  - During admission into an obstetric setting for a pregnancy or non-pregnancy related complaint
  - Immediately after birth (postnatal period)
The CEC’s Maternity Venous Thromboembolism Risk Assessment Tool was developed to:

- aid Midwives and MOs with assessing and managing VTE risk in maternity patients during all stages of their journey
- provide a standardised approach to VTE Risk Assessment
- provide a form of documentation showing the Midwife/MO’s risk assessment process and decision

Please note:

- The tool should be used for MATERNITY PATIENTS only
- Taking a comprehensive history streamlines the VTE risk assessment process and minimises the time it takes to complete an assessment
Who Should Complete the Tool?

• Either a Midwife or Medical Officer (JMO, Resident, Register or Consultant) can complete the tool.

• At <your facilities name> we encourage <midwives and/or medical officers> to complete the tool.

• Remember, following assessment, only a Medical Officer can prescribe appropriate prophylaxis.
Using the VTE Risk Assessment Tool

For ante/postpartum women during: (NB: This tool has the capacity for THREE occasions of screening)
- Booking-in
- Any antenatal admission
- When clinical situation alters
- Following a birth (vaginal or caesarean section) in the birth environment

• The tool is to be used for antenatal or postnatal women during:
  – Booking-in
  – Any antenatal admission
  – When clinical condition alters
  – Following a birth (vaginal or caesarean section) in the birth environment

• The tool can be used on 3 occasions
• If more than 3 assessments are required, get a new form
IVF Risk

• Following IVF, women are at a 7-fold increase in risk of VTE in the 1st trimester (SAX Institute 2015 Rapid Report)

• Other factors play a role, which include:
  – Hyperoestrogenaemia
  – oocyte retrieval
  – ovarian hyperstimulation syndrome
  – reduced mobility seem to play a role

• Ensure women admitted during the first trimester following IVF are risk assessed

• Risk may reduce over the course of the pregnancy, depending on the women's individual risk

NB: Women who are admitted during the first trimester following an IVF pregnancy are at an increased risk of VTE and require ongoing risk assessment with particular attention to the cumulative risk factors listed below.
Step 1:

- Assess VTE risk
- Place a tick (√) where a VTE risk factor is present.
- Start at the ‘Higher Risk’ section and move your way down until one of the following categories are met:
  - HIGHER RISK
  - INTERMEDIATE RISK
  - INTERMEDIATE RISK (due to ≥ 3 cumulative risk factors)
  - LOWER RISK
Using the VTE Risk Assessment Tool

- Some risk factors are related to the **post-partum period** only
- Shaded **purple** to differentiate

![VTE Risk Assessment Tool diagram]
Using the VTE Risk Assessment Tool

Step 1 cont:

• At the end of Step 1, risk factors should be assessed and the woman allocated into a risk category

• If the women is considered LOWER RISK → assessment COMPLETED

  – Guidance on Page 2, Step 4:
    “Encourage mobilisation, adequate hydration and consider graduate compression stockings or intermittent calf compressors”

  – Patient education

• If the women is considered INTERMEDIATE RISK or HIGHER RISK → CONTINUE to Step 2
Using the VTE Risk Assessment Tool

Step 2:

- Prompts identification to contraindications to pharmacological prophylaxis

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<td>CAUTION: Epidural catheter in situ (risk of epidural haematoma on insertion/removal of epidural catheter)</td>
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<td>Discussion must occur with anaesthetist</td>
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- If no C/I identified → **CONTINUE** to Step 3
Using the VTE Risk Assessment Tool

Step 2 cont:

• If a C/I is identified → Do **NOT** continue
• Need to consult with consultant O&G or consultant physician
• Therapy may not be appropriate for this women

**CAUTION**
If epidural catheter in situ

**CAUTION:** Epidural catheter in situ (risk of epidural haematoma on insertion/removal of epidural catheter)  Discussion must occur with anaesthetist

Speak with an anaesthetist
Using the VTE Risk Assessment Tool

Step 3:

• Time to educate and document
• On each occasion of screening ensure that you have completed the following:
  • Sign off and help others identify who completed the assessment and relevant steps

- [ ] Discussed VTE risk assessment outcome with women. Provided written information (where applicable)
- [ ] Document risk level on:
  - [ ] Health Care Record
  - [ ] Antenatal Hand Held Record (Antenatal Yellow Card)
  - [ ] eMaternity Alert Box

![Antenatal Record Form]

<table>
<thead>
<tr>
<th>Name:</th>
<th>Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>Designation:</td>
</tr>
</tbody>
</table>
Education

• It is vital that women are empowered with information on:
  – What some VTE risk factors are and what their level of risk is
  – What is being done to manage their risk and what they can do
  – What are some signs and symptoms of a VTE, and what they should do if they notice any of these
Education

• If the women is an **outpatient** OR to be **discharged** on prophylaxis, further education will be required to:
  
  – Show the women/her carer how to self-inject (or discuss what community healthcare providers can assist her eg GP, Community Nursing etc)
  
  – Resources available for both Clexane and Fragmin
Using the VTE Risk Assessment Tool

Step 4:

- This provides guidance for MOs to prescribe appropriately according to the risk level identified

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<tr>
<td>HIGHER RISK</td>
<td>Refer to Obstetrician/High Risk Obstetric team for management</td>
<td>As for lower risk below, PLUS Requires therapeutic anticoagulation</td>
</tr>
<tr>
<td>INTERMEDIATE RISK</td>
<td>Involvement of appropriate specialist should be considered in cases of uncertainty</td>
<td>As for lower risk below, PLUS Consider pharmacological prophylaxis with LMWH</td>
</tr>
<tr>
<td>LOWER RISK</td>
<td>Encourage mobilisation, adequate hydration and consider graduated compression stockings or intermittent calf compressors</td>
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- <may want to discuss the role that your local midwives have in guiding MOs (particularly JMOs) with prescribing>
Types of Prophylaxis

• There are **two types** of prophylaxis:

  1) Pharmacological prophylaxis:

  Examples include enoxaparin (Clexane™), dalteparin (Fragmin™) or unfractionated heparin. These are usually administered **subcutaneously**

  NB: Some women may require **therapeutic doses** of prophylaxis during their pregnancies.

  2) Mechanical prophylaxis:

  Examples include anti-embolic stockings, intermittent pneumatic compression or foot impulse devices
It is recommended that the VTE section of the NIMC is also completed:
1) Complete and sign the VTE risk assessment box
2) Prescribe any pharmacological prophylaxis within this section
3) Prescribe any mechanical prophylaxis within this section


If the women is an **outpatient** OR to be **discharged** on prophylaxis, ensure an appropriate **outpatient prescription** is provided
Mechanical Prophylaxis – Midwife Responsibility

• Regular monitoring of mechanical prophylaxis to ensure correct application.

• Check morning and evening shift
  – skin integrity (colour, warmth, pulse, pressure area)
  – stockings are being worn
  – responsible clinician signs their initials in the space provided when the check has been satisfactorily completed

• NB: Graduated compression stockings may increase the risk of falls in mobilising women. Approved non-slip oversocks or appropriate footwear should be worn to avoid falls.
Using the Tool
Using the Tool – Example ONE

Presentation:
• Presented at 36+5 with PPROM
• Multiple pregnancy
• PPH requiring blood transfusion

Patient Background:
• 29 years old
• Smoker

Medical History:
• Mild migraines

Medications:
• Nil regular

Assess risk at Day 0 postnatal
Using the Tool – Example ONE

Complete Steps 1.

|MATERNAL VENOUS THROMBOEMBOLISM (VTE) RISK ASSESSMENT TOOL|

For antepartum/postpartum women: This tool has the capacity for THREE occasions of screening:
- Booking-in
- Any antenatal admission
- Following a birth (midwife or caesarean section) in the birth environment

1. Assess Venous Thromboembolism Risk: Tick if VTE risk factor is present to determine risk level.

   - Venous Thromboembolism Risk Factor
     - Personal history of previous VTE and high risk thrombophilia (Antithrombin deficiency, Protein C or S deficiency, Homozygous Factor V Leiden, Homozygous Prothrombin G20210A, Prothrombin 20210A, or MTHFR)
     - Recurrent VTE with no known history of thrombophilia
     - Orphan hypercoagulable syndrome requiring admission (within the first trimester only)
     - Long term therapeutic anticoagulation is used prior to and/or during pregnancy for persistent indication

   - Pregnancy Risk
     - Any women requiring antenatal Low Molecular Weight Heparin (LMWH) for maternal VTE prophylaxis

   - Phase 2: If yes, continue to next phase.

   - Phase 3: If no, VTE risk is LOW.

   - HIGHER RISK
     - Personal history of VTE with no known thrombophilia
     - Asymptomatic high risk thrombophilia (as above)
     - Low risk thrombophilia and personal history of unprovoked VTE (Protein C deficiency, Protein S deficiency, Homozygous Factor V Leiden, Prothrombin G20210A or MTHFR)
     - Current medical condition, e.g. heart or lung disease, SLE, Scleroderma, Systemic inflammatory condition, nephrotic syndrome, stable or unstable angina, diabetes with microvascular complications
     - Obese (BMI > 30kg/m²)
     - Non obstetric surgery during pregnancy
     - Peripartum/postpartum infection
     - Severe disease in the current pregnancy
     - Postpartum Risk
       - Any surgical procedure except immediate repair of the uterus
       - Caesarean section in labour

   - INTERMEDIATE RISK
     - Age > 40 years
     - Obesity (BMI > 30kg/m²)
     - Previous VTE
     - Smoker
     - Current systemic illness
     - Extensive varicose veins
     - Proximal extended immobility, e.g. anaesthetic bed rest, paraesthesia, long distance travel
     - Family history of first degree relative with VTE
     - Pre-eclampsia in current pregnancy
     - Dehydration/hypovolemia
     - Multiple pregnancy
     - Abortion
     - Premature pre-labour rupture of membranes (PPROM)

   - LOWER RISK
     - If 2 cumulative risk factors present: INTERMEDIATE RISK
     - If ≤ 2 cumulative risk factors present: LOWER RISK

   - Cumulative Intermediate Risk Factors
     - Pharynx
     - Sinusitis
     - Acute upper respiratory infection
     - Multiple pregnancy
     - Abortion
     - Premature pre-labour rupture of membranes (PPROM)

   - Effective Caesarean section
     - PHH > 1 week or bilateral transfusion

   - If 2 cumulative risk factors present: INTERMEDIATE RISK
     - If ≤ 2 cumulative risk factors present: LOWER RISK
Using the Tool – Example ONE

Complete
Steps 2 to 4
Using the Tool – Example TWO

Presentation:
• Presented at 6+1 with hyperstimulation IVF

Patient Background:
• 41 years old

Medical History:
• Previous VTE following ankle surgery 3 years ago

Medications:
• Nil regular

Assess risk at on hospital admission
Using the Tool – Example TWO

Complete
Steps 1.
Using the Tool – Example TWO

Complete Steps 2 to 4

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<td>Women considered at risk of major haemorrhage (e.g. placenta praevia, High order multiple pregnancy)</td>
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**Impending Caesarean Section**

**CAUTION:** Epidural catheter in situ risk of epidural haemorrhage in incompatibility of episiotomy.

**3. Patient Education and Documentation of Risk Level and End Management**

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**4. Prophylaxis Guidance for Medical Officers According to Determined Risk Level**

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<tr>
<td>HIGHER RISK</td>
<td>As for lower risk below, PLUS Requires at least 6 weeks pharmacological prophylaxis with LMWH</td>
<td>As for lower risk below, PLUS Requires at least 7 days pharmacological prophylaxis with LMWH</td>
</tr>
<tr>
<td>INTERMEDIATE RISK</td>
<td>As for lower risk below, PLUS Consider if necessary intensive compression prophylaxis</td>
<td>As for lower risk below, PLUS Requires at least 7 days pharmacological prophylaxis with LMWH</td>
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<td>LOWER RISK</td>
<td>Encourage mobilisation, adequate hydration and consider graduated compression stockings or intermittent calf compressors</td>
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**Thromboprophylaxis is when the blood has an increased tendency to form clots. When screening, ask the woman if she is aware of having an increased tendency to form clots, and if so, whether she has had tests indicating the blood tests should be performed unless requested by an obstetrician. Most women do NOT require thromboprophylaxis.**

Page 2 of 42
Presentation:
• Antenatal booking
• 8+3 gestation

Patient Background:
• 31 years old
• Obesity (BMI 34kg/m²)

Medical History:
• Nil significant

Medications:
• Antenatal vitamins

Assess risk at booking-in
Using the Tool – Example THREE

Complete Steps 1.
Using the Tool – Example THREE

Complete Steps 2 to 4

**MATERNAL VENOUS THROMBOEMBOLISM (VTE) RISK ASSESSMENT TOOL**

**2. Identify Possible Contraindications to Pharmacological Prophylaxis: Tick if present**

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<td>Current arterial bleeding</td>
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**3. Patient Education and Documentation of Risk Level and Management**

- Discussed VTE risk assessment outcomes with women. Provided written information (where applicable)
- Document risk level on:
  - Health Care Record
  - Antenatal Hand Held Record (Antenatal Yellow Card)

**4. Prophylaxis Guidance for Medical Orders According to Determined Risk Level**

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<tr>
<td>INTERMEDIATE RISK</td>
<td>Instrument of appropriate specialist should be consulted in cases of uncertainty</td>
<td>As for lower risk below, PLUS requires at least 6 weeks pharmacological prophylaxis with LMWH</td>
</tr>
<tr>
<td>LOWER RISK</td>
<td>Encourage mobilisation, adequate hydration and consider graduated compression stockings or intermittent compression devices</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Note:** Remember, the blood has an increased tendency to form clots. When someone asks the woman if she is aware of having an increased tendency to form clots, and whether she has had blood tests indicating this, blood tests should not be performed unless requested by an appropriate person. Most women do not require full blood testing.
Summary

• VTE affects women during their pregnancy
• VTE is highly preventable
• The Maternity VTE Risk Assessment Tool aids in assessing and managing VTE risk in women throughout their birthing journey
• It is intended to provide guidance. The tool does not preclude the use of clinical judgment and discretion
• VTE prevention is a team effort and is everybody’s business
Questions

For further information:

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