



AOA

AUSTRALIAN  
ORTHOPAEDIC  
ASSOCIATION

## **DISCLAIMER—ARTHROPLASTY SOCIETY VTE INFORMATION**

Venous thromboembolism is the most common complication after total hip and total knee arthroplasty. In recent times members of the Australian Orthopaedic Association (AOA) have conducted a detailed review of the available literature on Venous Thrombotic Episode (VTE) prophylaxis in arthroplasty surgery in order to determine whether AOA could provide clear direction to its members on AOA's position regarding VTE prophylaxis. AOA was unable to do so and subsequently requested that the Arthroplasty Society of Australia review the available literature, including recent proposed information of other arthroplasty surgeons and bodies in Australia, in order to formulate information for VTE prophylaxis in arthroplasty surgery.

While every effort is made to ensure the accuracy, relevance and up-to-date nature of the information contained in the VTE material herein, AOA, its officers, councillors and employees assume no responsibility for its content, use or interpretation. Members should rely on their own inquiries before making decisions that touch their own interests. AOA by this statement intends to exclude liability for any statements contained in the VTE Information.

## AUSTRALIAN ARTHROPLASTY SOCIETY OF AUSTRALIA GUIDELINES FOR VTE PROPHYLAXIS FOR HIP AND KNEE ARTHROPLASTY

### Introduction

Hip and knee arthroplasty surgery are amongst the most successful quality of life improving medical interventions. However, these interventions are a balance of benefit and exposure risk. The increased risk of mortality following hip and knee arthroplasty surgery is well documented by population studies; the daily mortality risk of patients in the age most likely to have joint replacement is 0.1% per day and this risk is increased by a further 0.12% over a 26 day period following arthroplasty surgery (1). The leading aetiology of patient mortality following arthroplasty surgery is cardiovascular (2), but thromboembolic mortality and symptoms are an important and controversial consideration because they are potentially amenable to risk reduction.

Despite the increasing administration of various chemoprophylactic agents, there has been little impact on the incidence of fatal and non fatal pulmonary embolus (PE) over the last 10-15 years.(2,3). In a recent study, Sharrock et al (4), found that the incidence of all cause mortality was in fact higher after administration of chemoprophylaxis compared with mechanical devices and aspirin.

The Arthroplasty Society of Australia has reviewed recent proposed guidelines of NH&MRC, AAOS, ACCP, RACS and felt obliged to formulate aggregated guidelines, based on current literature evidence and evaluation by respected arthroplasty surgeons in Australia.

The Society has divided patients undergoing THR (Total Hip Replacement) and TKR (Total Knee Replacement) into high risk (of PE and bleeding) and low risk, according to the attached list of predisposing factors and pre-existing conditions (see Appendix A)

#### 1. General Considerations- for all patients independent of risk assessment

- i. Early mobilisation post arthroplasty
- ii. Spinal anaesthesia
- iii. Use/ non use of tourniquet in TKR
- iv. Signing an informed consent for the agreed and preferred treatment option
- v. Minimum treatment for VTE prophylaxis should be three to six weeks

#### 2. A. Patients with High Risk Of VTE (see Appendix A)

If patient already on Warfarin or Plavix for a cardiac condition, consult the cardiologist concerned for an agreed consultative program of ongoing VTE prophylaxis.

Plavix (Clopidogrel) should be ceased at least 10 days from surgery and Warfarin five days from intended surgery.

Warfarin can be reversed for a 24 hour window with Prothrombin X

Peri-operative options include:-

- i. Sequential compression device (SCD) in combination with :-
- ii. Warfarin – return to pre op level or if not previously on warfarin  $\geq 2$
- iii. LMWH
- iv. Rivaroxaban, 10mgm per day
- v. IVC Filter
- vi. A patient request for any of the above

#### 3. B. Patients with High Risk of Bleeding (see Appendix A)

Peri-operative options include:-

- i. SCD
- ii. IVC Filter

#### 4. Patients with Low Risk Of VTE

Peri-operative options in isolation or combination include:-

- i. SCD
- ii. Aspirin- 150-300mgms per day
- iii. LMWH
- iv. No chemoprophylaxis.

## 5. Non Compliant Patients

Peri-operative options in isolation or combination

- i. SCD
- ii. Aspirin- 150-300mgms per day
- iii. LMWH
- iv. No chemoprophylaxis
- v. No treatment

## Post Operative

Patients with proven symptomatic DVT below the knee should be treated with 300mgms aspirin per day with follow up ultrasound at two weeks. If progression detected, warfarin treatment should be instituted (5)

## References

1. Lie SA, Pratt P, Ryan P, Engaester LB, Havelin LI, Furnes O, Graves SG, 'Duration of the Increase in early Postoperative Mortality After Elective Hip and Knee Replacement' *The Journal of Bone and Joint Surgery (Am)* 2010; 92:58-63.
2. Howie C, Hughes H, Watts AC, 'Venous Thromboembolism Associated With Hip and Knee Replacement over a 10 Year Period: A Population based Study' *The Journal of Bone and Joint Surgery (Br)* 2005; 87:1675
3. Lie SA, Engaester LB, Havelin LI, et al. 'Early Postoperative Mortality after 67,548 Total Hip Replacements: Causes of Death and Thromboprophylaxis in 68 Hospitals in Norway from 1987 to 1999' *Acta Orthop Scand* 2002; 73:392
4. Sharrock NE, Gonzalez DV, Go G, et al 'Potent Anticoagulants are Associated with a Higher All-cause Mortality rate after Hip and Knee Arthroplasty' *Clinical Orthop Related Res* 2008; 466:714
5. Bjornara BT, Gudmundsen TE, Dahl OE, 'frequency and Timing of Clinical thromboembolism after Major Joint Surgery' *The journal of Bone and Joint Surgery (Br)* 2006; 88:386-391

## Appendix A

Conditions That Place Patients at Increased Risk of PE and/ or Major Bleeding (Compared With Other Patients Undergoing THR and TKR)

### 1. Increased Risk of PE

#### a. Preoperative Conditions

Previous documented history of PE

Previous documented history of other thrombo embolic events

Maintenance treatment with anticoagulants

Limitations to mobility that would impair early adequate mobilisation post surgery

Known hypercoagulable states (malignancy, oestrogen use, protein C and protein S deficiency, antiphospholipid antibodies, antithrombin deficiency, factor V Leiden, acquired or congenital thrombophilias, prothrombin mutation 20210A)

Documented family history of PE

Marked obesity, smoking, venous stasis, IDDM, concomitant fracture

Hormone replacement therapy or continuing on oral contraceptive (other than low dose Progesterone only)

#### b. Perioperative events

Any event that limits mobilisation including but not limited to: - cardiac events, infections, severe pain, ileus

### 2. Increased Risk of Major Bleeding

#### a. Preoperative Conditions

Known bleeding disorder

History of documented bleeding on chemoprophylactic agents

History of documented major gastrointestinal bleeding

History of documented haemorrhagic stroke

History of other documented major bleeding event

#### b. Perioperative Events

Revision THA/TKA

Major surgical bleeding

Other major bleeding episode.

## Appendix B

### Recent proposed guidelines

1. NHMRC Clinical Practice Guideline-for the prevention of venous thromboembolism (deep vein thrombosis- and pulmonary embolism) in patients admitted to Australian Hospitals- Dec -09  
<http://www.nhmrc.gov.au/nics/programs/vtp/prevention.htm>
2. The Australian and New Zealand Working Party on the Management and Prevention of Venous Thromboembolism- Best Practices for Australia and New Zealand- 4th Edition  
<http://www.surgeons.org/Content/NavigationMenu/FellowshipandStandards/Resourcesfor surgeons/default.htm>
3. Parvizi J., Azzam K, Rothman RH, 'Deep Venous Thrombosis Prophylaxis for Total Joint Arthroplasty; American Academy of Orthopaedic Surgeons Guidelines'.  
*J. Arthroplasty* 2008; 23 Suppl 1
4. Geerts WH., Pineo GF., Heit JA., et al. 'Prevention of Venous thromboembolism: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy'  
*Chest* 2004; 126 (3 Suppl); 338S
5. Callaghan JJ., Dorr LD., Engh GA, et al. 'Prophylaxis for Thromboembolic disease: recommendations of the American College of Chest Physicians- are they appropriate for orthopaedic surgery?'  
*J. Arthroplasty* 2005; 20-273

Effective 14 September 2010, date of review prior to September 2013

## Appendix C

### *Examples of current protocols*

## PROTOCOL FOR DVT PROPHYLAXIS FOR PATIENTS UNDERGOING TOTAL HIP REPLACEMENT (THR) AND TOTAL KNEE REPLACEMENT (TKR) AT REPATRIATION GENERAL HOSPITAL (RGH) SOUTH AUSTRALIA

Patients undergoing THR and TKR at RGH are to be divided into high and low risk categories according to the attached list of predisposing factors and pre- existing conditions.

### 1. High Risk Patients

#### A) Increased risk of VTE (Venous Thrombotic Episode)

a) If patient preoperatively on warfarin, to return to pre operative INR as soon as practical.

- No pumps
- To commence warfarin on night of surgery, using Southern Health Protocol for initial high dose loading, covered by Clexane 1mgm/kgm /day until INR reaches desired level
- b) If patient not preoperatively on warfarin,
  - No pumps
  - commence Rivaroxaban 10mgms daily on day of surgery and continue 14 days post operatively for TKR and 35 days post operatively for THR

#### B) Increased risk of bleeding

Peri-operative options include

- sequential compression device pump (SCD) thigh length sleeve for THR or A-V impulse foot pump for TKR
- Inferior vena cava (IVC) filter

### 2. Low Risk Patients

#### A) For compliant patients:-

- SCD thigh length sleeves or A-V foot pumps to be applied in the operating theatre and can be used either intra-operatively (sterile pumps are available) or on completion of surgery. SCD/Foot pumps to continue until discharge
- a compliance chart to be activated upon application of pumps
- coated aspirin 150mgms per day orally to commence post-op day one and continue for 6 weeks from surgery
- patients preoperatively on Plavix or other; recommence upon discharge or post-op day seven

#### B) For non compliant patients:-

- pumps not suitable
- coated aspirin 150mgms per day orally to commence post-op day one and continue for 6 weeks from surgery
- patients preoperatively on Plavix or other; recommence upon discharge or post-op day seven

**Precautions.**

- Below knee DVT once detected, to be treated with Aspirin 300mgm per day with (repeat) ultrasound review two weeks from incident diagnosis.
- More proximal DVT/ PE once detected, to be treated with warfarin under physician guidance
- Use of compression stockings to be considered only where significant lymphoedema is present and where patient has assistance in application
- Clopidogrol (Plavix) and similar agents should be ceased 10 days before surgery (in consultation with patient's cardiologist)
- Warfarin can be reversed for a 24 hour window with Prothrombin X
- Preferred use of SCD thigh length sleeve for THR, A-V impulse foot pump for TKR

*Sept 10.*

# VTE PROPHYLAXIS

## POST HIP & KNEE ARTHROPLASTY

### SEQUENTIAL COMPRESSION DEVICE

Patient Name: .....

MRN Number: .....

#### *Treatment Options: Compliant patients only*

Low risk of DVT

Aspirin 150mgms per day orally (see drug chart) and SCD foot pumps and thigh length sleeves

**Neurovascular observations color, warmth, sensitivity, movement and pulse (recorded each shift on patient neurovascular chart) along with correct positioning and that no compression is around knee (SCD) thigh length sleeve and pump is on each shift.**

*Please mark (on) time when (SCD) pump is turned on.*

*Please mark (off) time when (SCD) pump is turned off.*

*Reminder (on/off) could occur multiple times during the day.*

*SCD foot pumps and thigh length sleeves issued via theatre. Please return to theatre when no longer in use.*

*Instructions on how to use and the care of the pumps is attached to (SCD) pump.*

*The SCD foot pumps and thigh length sleeves to remain in use until patient is fully ambulant on their own.*

*Note non operated leg time on & operated leg time on*

**Day 1** Date:..... Day of surgery

0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

**Day 2** Date:.....

0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

**Day 3** Date:.....

0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

**Day 4** Date:.....

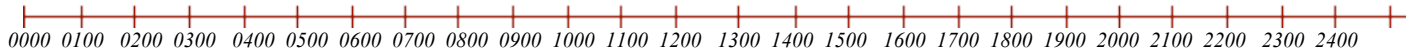
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**Day 5** Date:.....

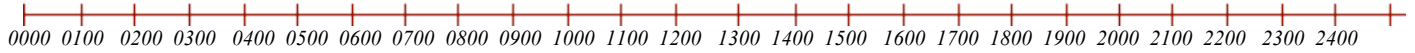
0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

*See over for extra days*

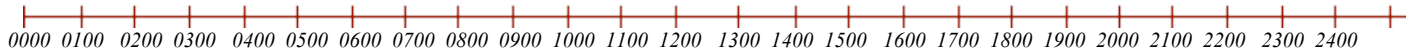
**Day 6** Date:.....



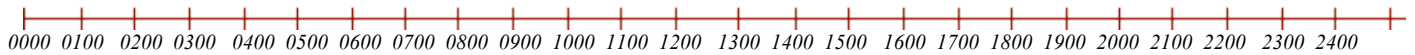
**Day 7** Date:.....



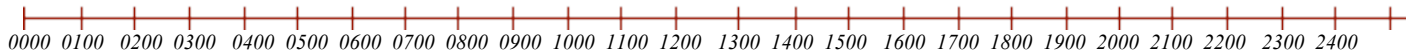
**Day 8** Date:.....



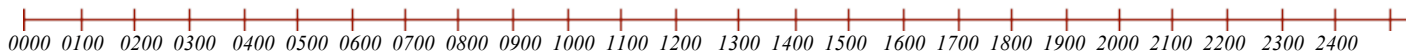
**Day 9** Date:.....



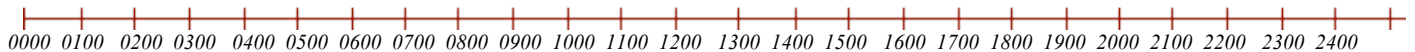
**Day 10** Date:.....



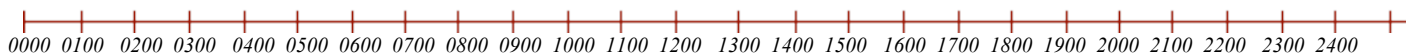
**Day 12** Date:.....



**Day 13** Date:.....



**Day 14** Date:.....



Day 14 cease (SCD) is still inpatient.