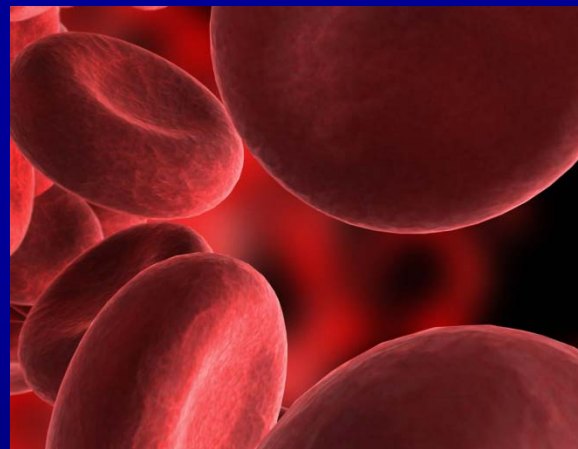

Anticoagulation *Guideline Update 2008*



**Harris County Hospital District
Houston, Texas**

Objectives

- **To educate providers about National Patient Safety Goal (NPSG) 3E: Anticoagulation Therapy**
 - **Goal of The Joint Commission**
 - **All health care institutions accredited by The Joint Commission must comply**
- **To educate providers about the recent updates to the international anticoagulation guidelines**

Rationale for NPSG 3E

- **Use of standardized practices**
- **Reduce the likelihood of patient harm associated with the use of anticoagulation therapy**
- **Changes in medical practice**



Management of the Vitamin K Antagonists (VKA)

Warfarin

- **Mechanism of action**

- Inhibits production of vitamin K dependent clotting factors II, VII, IX, and X
- Interferes with synthesis of Vitamin K dependent proteins C and S

| Clotting Factors | Degradation half-lives |
|------------------|------------------------|
| VII | 2-6 hours (~6) |
| IX | 18-40 hours (~25) |
| X | 30-70 hours (~35.6) |
| II | 48-120 hours (~60) |

- Onset of action: 3-5 days
- **Disadvantages of Warfarin Loading Dose**
 - Increased risk of bleeding
 - Severe depletion of proteins C and S may cause a hypercoagulable state

Pharmacology and Management of VKAs

- **2.1 Initiation and Maintenance Dosing**
 - **Patients beginning VKA therapy**
 - Recommend the initiation of oral anticoagulation with doses between 5 and 10 mg for the first 1 or 2 days for most individuals, with subsequent dosing based on the international normalized ratio (INR) response (Grade 1B)
 - **2.2 Initiation of Anticoagulation in the Elderly or Other Populations**
 - **Elderly patients or patients who are debilitated, are malnourished, have congestive heart failure, have liver disease, have had recent major surgery, or are taking medications known to increase the sensitivity to warfarin (eg, amiodarone)**
 - Recommend the use of a starting dose of ≤ 5 mg (Grade 1C), with subsequent dosing based on the INR response
- **Ansell J, et al. Pharmacology and management of the vitamin K antagonists. American college of chest physicians evidence-based clinical practice guidelines (8th edition). CHEST2008;133:160S-198S.**

Pharmacology and Management of VKAs

- **2.3 Frequency of Monitoring**
 - **Patients beginning VKA therapy**
 - Suggest that INR monitoring should be started after the initial 2 or 3 doses of oral anticoagulation therapy (Grade 2C)
 - **Patients receiving stable dose of oral anticoagulants**
 - Suggest monitoring at an interval of no longer than every 4 weeks (Grade 2C)
- Ansell J, et al. Pharmacology and management of the vitamin K antagonists. American college of chest physicians evidence-based clinical practice guidelines (8th edition). CHEST2008;133:160S-198S.

Pharmacology and Management of VKAs

| Situation | Recommendation |
|--|---|
| INR is above the therapeutic range, but < 5 No significant bleeding | <ul style="list-style-type: none"> Lower the dose of warfarin (i.e. decrease the total weekly dose by 5-20% or omit 1 dose of warfarin) Monitor more frequently (e.g. next INR within 2-8 days) Resume the warfarin when INR is therapeutic If the INR is only minimally above the therapeutic range, no dose reduction may be required |
| INR \geq 5 but < 9 No significant bleeding | <ul style="list-style-type: none"> Omit the next 1 or 2 doses of warfarin Monitor more frequently (e.g. next INR within 1-5 days) Resume warfarin at a lower dose when INR is therapeutic <p><i>Alternative for patients at increased risk of bleeding:</i></p> <ul style="list-style-type: none"> Omit one dose Give Vitamin K 1-2.5 mg orally once[#] <p><i>If more rapid reversal is required because the patient requires urgent surgery:</i></p> <ul style="list-style-type: none"> Give Vitamin K 2.5-5 mg orally once (with the expectation that a reduction of INR will occur within 24 hours.) If INR is still high, additional Vitamin K 1-2 mg orally once[#] can be given. |
| INR \geq 9 No significant bleeding | <ul style="list-style-type: none"> Hold warfarin therapy Give a higher dose of Vitamin K orally (2.5-5 mg) with the expectation that the INR will be substantially reduced in 24-48 hrs Monitor more frequently Use additional Vitamin K if necessary Resume therapy at a lower dose when the INR is therapeutic |
| Significant bleeding with any elevation of INR | <ul style="list-style-type: none"> Contact physician immediately (and revert protocol to physician)* Hold warfarin therapy Give Vitamin K by slow infusion (10 mg IVPB over 30 minutes)-Caution: possible anaphylaxis Supplement with fresh frozen plasma, prothrombin complex concentrate, or recombinant factor VIIa (Consult hematology before recombinant factor VIIa use) Vitamin K can be repeated every 12 hours or more often, if necessary |

Parenteral Anticoagulants



Parenteral Anticoagulants

- **2.2.4 Dosing and Monitoring in Special Situations**

- **Obese patients receiving LMWH**

- Suggest weight-based dosing (Grade 2C)

- **Patients with severe renal insufficiency (creatinine clearance [CrCl] < 30 ml/min) who require therapeutic anticoagulation**

- Suggest the use of UFH instead of LMWH (Grade 2C)

- **If LMWH is used in those with CrCl < 30ml/min**

- Suggest using 50% of the recommended dose (Grade 2C)

- Hirsh J, et.al. Parenteral anticoagulants. American college of chest physicians evidence-based clinical practice guidelines (8th edition). CHEST2008;133:141S-159S.

Parenteral Anticoagulants

- **2.2.3 Monitoring Antithrombotic Effect**
 - **Patients treated with LMWH**
 - Recommend *against* routine coagulation monitoring (Grade 1C)
 - **Pregnant women treated with therapeutic doses of LMWH**
 - Recommend monitoring of anti-Xa levels (Grade 1C)
- Hirsh J, et.al. Parenteral anticoagulants. American college of chest physicians evidence-based clinical practice guidelines (8th edition). CHEST2008;133:141S-159S.

Perioperative Management of Antithrombotic Therapy



Perioperative Management of Antithrombotic Therapy

5.0 Perioperative Management of Antithrombotic Therapy in Patients Who Require Dental, Dermatologic, or Ophthalmologic Procedures

- **Dental Procedures**
 - **Patients who are undergoing minor dental procedures and receiving VKAs**
 - **Minor = *single or multiple tooth extractions and endodontic (root canal) procedures***
 - **Recommend continuing VKAs around the time of the procedure and coadministering an oral prohemostatic agent (Grade 1B)**

Perioperative Management of Antithrombotic Therapy

- **Dermatologic Procedures**

- **Patients who are undergoing minor dermatologic procedures and receiving VKAs**

- *Minor = excision of basal and squamous cell carcinomas, actinic keratoses and malignant or premalignant nevi*
- Recommend continuing VKAs around the time of the procedure (Grade 1C)

- **Ophthalmologic Procedures**

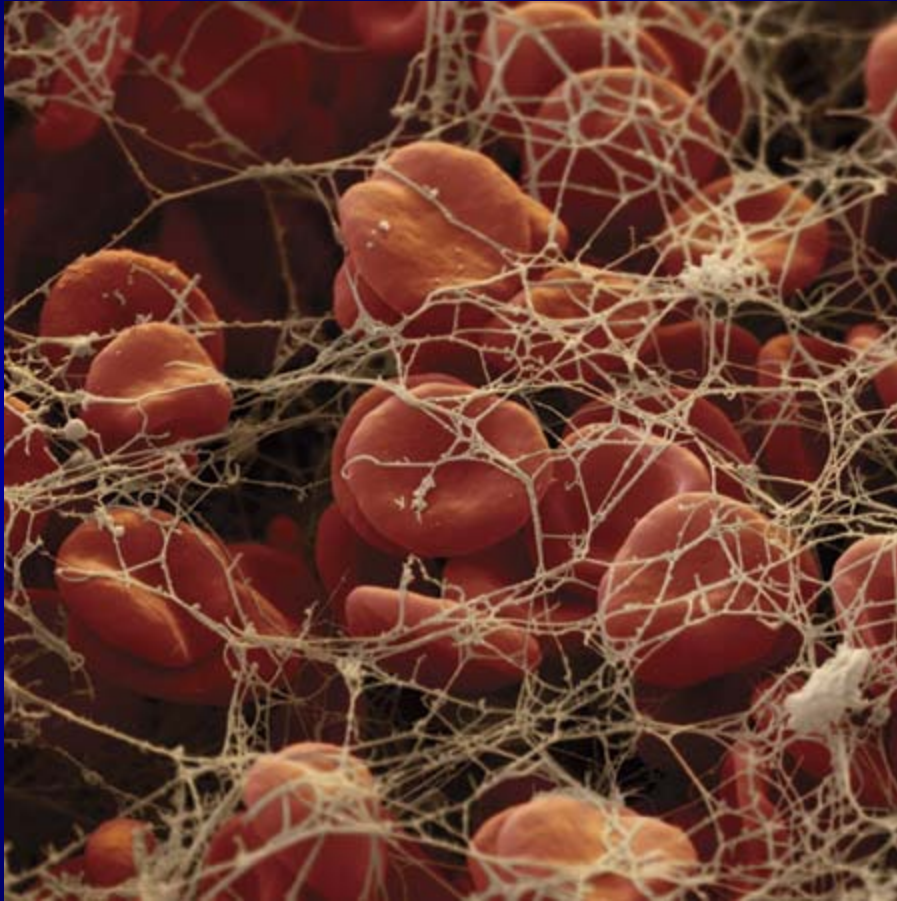
- **Patients who are undergoing cataract removal and receiving VKAs**

- Recommend continuing VKAs around the time of the procedure (Grade 1C)

Perioperative Management of Antithrombotic Therapy

6.0 Perioperative Management of Antithrombotic Therapy Patients Who Require Urgent Surgical or Other Invasive Procedures

- **Patients receiving VKAs requiring reversal of the anticoagulant effect for urgent surgical or invasive procedure**
 - Recommend treatment with low-dose (2.5 – 5 mg) IV or PO vitamin K (Grade 1C)
- **More immediate reversal of the anticoagulant effect**
 - Suggest treatment with FFP or another prothrombin concentrate + low-dose IV or PO vitamin K (Grade 2C)
 - Recommendations for platelet inhibitors are available in the supplement



Antithrombotic Therapy for Venous Thromboembolic Disease

Antithrombotic Therapy for Venous Thromboembolic Disease

1.1 Initial Anticoagulation of Acute DVT of the Leg

| Situation | Details | Recommendation | Grade |
|-------------------------------|--|--|-------|
| Short-term treatment, initial | Patients with objectively confirmed DVT | Recommend short-term treatment with one of the following over no such short-term treatment | |
| | | SC LMWH | 1A |
| | | IV UFH | 1A |
| | | Monitored SC UFH | 1A |
| | | Fixed-dose SC UFH | 1A |
| | | SC fondaparinux | 1A |
| | Patients with high clinical suspicion of DVT | Recommend treatment with anticoagulants while awaiting the outcome of diagnostic tests | 1C |
| Patients with acute DVT | Recommend initial treatment with LMWH, UFH or fondaparinux for at least 5 days and until the INR is ≥ 2.0 for 24 hours | 1C | |
| | Recommend initiation of VKA together with LMWH, UFH or fondaparinux on the first treatment day rather than delayed initiation of VKA | 1A | |

Antithrombotic Therapy for Venous Thromboembolic Disease

1.2 IV UFH for the Initial Treatment of DVT

| Situation | Details | Recommendation | Grade |
|-------------------------|---------------------|---|-------|
| Patients with acute DVT | If IV UFH is chosen | Recommend that after an initial IV bolus (80 units/kg or 5000 units), it be administered by continuous infusion (initially at a dose of 18 units/kg/hour or 1300 units/hour) with dose adjustments to achieve and maintain an activated partial thromboplastin time (APTT) prolongation that corresponds to plasma heparin levels of 0.3 to 0.7 units/ml anti-Xa activity by the amidolytic assay rather than administration as IV boluses throughout treatment, or administration without coagulation monitoring | 1C |

1.3 SC UFH Compared with IV Heparin for the Initial Treatment of DVT

| Situation | Details | Recommendation | Grade |
|-------------------------|---|--|-------|
| Patients with acute DVT | If monitored SC UFH is chosen | Recommend an initial dose of 17,500 units or a weight-adjusted dose of about 250 units/kg BID, with dose adjustment to achieve and maintain an APTT prolongation that corresponds to plasma heparin levels of 0.3 – 0.7 units/ml anti-Xa activity when measured 6 h after injection rather than starting with a smaller initial dose | 1C |
| | If fixed-dose, unmonitored SC UFH is chosen | Recommend an initial dose of 333 units/kg followed by 250 units/kg BID rather than non-weight based dosing | 1C |

Antithrombotic Therapy for Venous Thromboembolic Disease

1.4 LMWH for the Initial Treatment of DVT

| Situation | Details | Recommendation | Grade |
|-------------------------|----------------------|---|-------|
| Patients with acute DVT | | Recommend initial treatment with LMWH SC once or twice daily as an outpatient, if possible, rather than treatment with IV UFH | 1C |
| | | Or as an inpatient, if necessary | 1A |
| | Treated with LMWH | Recommend against routine monitoring with anti-factor Xa level measurements | 1A |
| | Severe renal failure | Suggest UFH over LMWH | 2C |

Antithrombotic Therapy for Venous Thromboembolic Disease

2.1 Duration of Anticoagulant Therapy

| Situation | Details | Recommendation | Grade |
|-------------------|--|--|-------|
| Patients with DVT | Patients with DVT secondary to a transient (reversible) risk factor | Recommend treatment with a VKA for 3 months over treatment for shorter periods | 1A |
| | Patients with unprovoked DVT | Recommend treatment with a VKA for at least 3 months | 1A |
| | | Recommend that after 3 months of anticoagulant therapy, all patients with unprovoked DVT should be evaluated for the risk-benefit ratio of long-term therapy | 1C |
| | First unprovoked proximal DVT, risk factors for bleeding are absent, good anticoagulant monitoring is achievable | Recommend long-term treatment | 1A |
| | Patients with a second episode of unprovoked VTE | Recommend long-term treatment | 1A |
| | Patients with a first isolated distal DVT that is unprovoked | Suggest that 3 months of anticoagulant therapy is sufficient rather than indefinite therapy | 2B |

Antithrombotic Therapy for Venous Thromboembolic Disease

2.6 Treatment of Asymptomatic DVT of the Leg

| Situation | Details | Recommendation | Grade |
|-----------|--|--|-------|
| | Patients who are unexpectedly found to have asymptomatic DVT | Recommend the same initial and long-term anticoagulation as for comparable patients with symptomatic DVT | 1C |

3.1 Elastic Stockings and Compression Bandages to Prevent PTS (postthrombotic [phlebitic] syndrome)

| Situation | Details | Recommendation | Grade |
|--|--|--|-------|
| Patient who has had a symptomatic proximal DVT | | Recommend the use of an elastic compression stocking with an ankle pressure gradient of 30 – 40 mm Hg, if feasible | 1A |
| | Compression therapy, which may include use of bandages acutely | Should be started as soon as feasible after starting anticoagulant therapy and should be continued for a minimum of 2 years, and longer if patients have symptoms of PTS. (Note: feasibility, both short and long term, refer to ability of patients and their caregivers to apply and remove stockings) | |

Antithrombotic Therapy for Venous Thromboembolic Disease

4.1 IV or SC UFH, SC LMWH, SC Fondaparinux, and VKA for the Initial Treatment of PE

| Situation | Details | Recommendation | Grade |
|-------------------------|--|---|-------|
| Initial treatment of PE | Patients with objectively confirmed PE | Recommend short-term treatment with one of the following rather than no such acute treatment. | |
| | | SC LMWH | 1A |
| | | IV UFH | 1A |
| | | Monitored SC UFH | 1A |
| | | Fixed-dose SC UFH | 1A |
| | | SC fondaparinux | 1A |
| | Patients with acute PE should also be routinely assessed for treatment with thrombolytic therapy | | |
| | Patients with a high clinical suspicion of PE | Recommend treatment with anticoagulants while awaiting the outcome of diagnostic tests | 1C |
| | Patients with acute PE | Recommend initial treatment with LMWH, UFH or fondaparinux for at least 5 days and until the INR is ≥ 2.0 for at least 24 h | 1C |
| | | Recommend initiation of VKA together with LMWH, UFH, or fondaparinux on the first treatment day rather than delayed initiation of VKA | 1A |

Kearon C, et.al. Antithrombotic therapy for venous thromboembolic disease. American college of chest physicians evidence-based clinical practice guidelines (8th edition). Chest 2008;133:454S–545S.

Antithrombotic Therapy for Venous Thromboembolic Disease

4.1 IV or SC UFH, SC LMWH, SC Fondaparinux, and VKA for the Initial Treatment of PE

| Situation | Details | Recommendation | Grade |
|-------------------------|---|---|-------|
| Initial treatment of PE | Patients with acute PE, if IV UFH is chosen | Recommend that after an initial IV bolus (80 units/kg or 5000 units), it be administered by continuous infusion (initially at a dose of 18 units/kg/hour or 1300 units/hour) with dose adjustments to achieve and maintain an activated partial thromboplastin time (APTT) prolongation that corresponds to plasma heparin levels of 0.3 to 0.7 units/ml anti-Xa activity by the amidolytic assay rather than administration as IV boluses throughout treatment, or administration without coagulation monitoring | 1C |
| | Patients with acute PE, if monitored SC UFH is chosen | Recommend an initial dose of 17,500 units or a weight-adjusted dose of approximately 250 units/kg BID, with dose adjustment to achieve and maintain an APTT prolongation that corresponds to plasma heparin levels of 0.3 – 0.7 units/ml anti-Xa activity when measured 6 h after injection rather than starting with a smaller initial dose | 1C |

Antithrombotic Therapy for Venous Thromboembolic Disease

| 4.1 IV or SC UFH, SC LMWH, SC Fondaparinux, and VKA for the Initial Treatment of PE | | | |
|---|---|--|-------|
| Situation | Details | Recommendation | Grade |
| Initial treatment of PE | Patients with acute PE, if fixed-dose, unmonitored SC UFH is chosen | Recommend an initial dose of 333 units/kg followed by a twice-daily dose of 250 units/kg rather than non-weight-based dosing | 1C |
| | Patients with acute nonmassive PE | Recommend initial treatment with LMWH over IV UFH | 1A |
| | Patients with massive PE, in other situations where there is concern about SC absorption, or in patients for whom thrombolytic therapy is being considered or planned | Suggest IV UFH over SC LMWH, SC fondaparinux or SC UFH | 2C |
| | Patients with acute PE treated with LMWH | Recommend against routine monitoring with anti-factor Xa level measurements | 1A |
| | Patients with acute PE and severe renal failure | Suggest UFH over LMWH | 2C |

Antithrombotic Therapy for Venous Thromboembolic Disease

| 5.0 Long-term Treatment of Acute PE | | | |
|-------------------------------------|--|---|-------|
| Situation | Details | Recommendation | Grade |
| Patient with PE | PE secondary to a transient (reversible) risk factor | Recommend treatment with a VKA for 3 months over treatment for shorter periods | 1A |
| | Unprovoked PE | Recommend treatment with a VKA for at least 3 months | 1A |
| | | Recommend that after 3 months of anticoagulant therapy, all patients with unprovoked PE should be evaluated for the risk-benefit ratio of long-term therapy | 1C |
| | Patients with a first unprovoked episode of VTE that is a PE and in whom risk factors for bleeding are absent and for whom good anticoagulant monitoring is achievable | Recommend long-term treatment | 1A |
| | Patients with a second episode of unprovoked VTE | Recommend long-term treatment | 1A |
| Patients with PE and cancer | | Recommend LMWH for the first 3 – 6 months of long-term anticoagulant therapy | 1A |
| | | Recommend subsequent anticoagulant therapy with VKA or LMWH indefinitely or until the cancer is resolved | 1C |

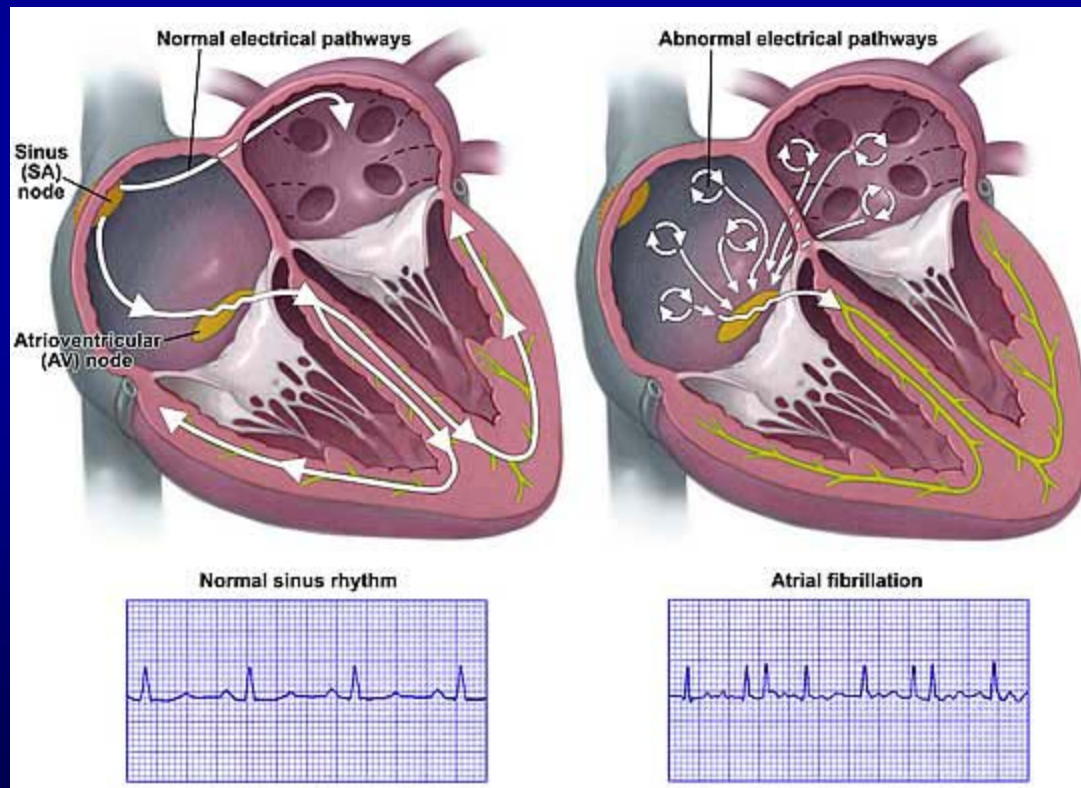
Kearon C, et.al. Antithrombotic therapy for venous thromboembolic disease. American college of chest physicians evidence-based clinical practice guidelines (8th edition). Chest 2008;133:454S–545S.

Antithrombotic Therapy for Venous Thromboembolic Disease

5.0 Long-term Treatment of Acute PE

| Situation | Details | Recommendation | Grade |
|--|---|---|-------|
| Patients who receive long-term anticoagulant treatment | | The risk-benefit ratio of continuing such treatment should be reassessed in the individual patient at periodic intervals | 1C |
| Patients with PE | | Recommend that the dose of VKA be adjusted to maintain a target INR of 2.5 (range 2.0 – 3.0) for all treatment durations | 1A |
| | Patients with unprovoked PE who have a strong preference for less frequent INR testing to monitor their therapy | Recommend after the first 3 months of conventional-intensity anticoagulation (INR range, 2.0 – 3.0) low-intensity therapy (range, 1.5 – 1.9) with less frequent INR monitoring over stopping treatment | 1A |
| | | Recommend against high-intensity VKA therapy (INR range, 3.1 – 4.0) compared to an INR range of 2.0 – 3.0 | 1A |
| | Patients who are unexpectedly found to have asymptomatic PE | Recommend same initial and long-term anticoagulation as for comparable patients with symptomatic PE | 1C |

Antithrombotic Therapy in Atrial Fibrillation



Antithrombotic Therapy in Atrial Fibrillation

| 1.1 Atrial Fibrillation (AF) | | | |
|---|---|---|-------|
| Situation | Details | Recommendation | Grade |
| Patients with AF, including those with paroxysmal AF | Who have had a prior ischemic stroke, TIA or systemic embolism | Recommend long-term anticoagulation with an oral vitamin K antagonist, such as warfarin, targeted at an INR of 2.5 (range, 2.0 – 3.0) because of the high risk of future ischemic stroke faced by this set of patients* | 1A |
| | Who have two or more of the following risk factors for future ischemic stroke: <ul style="list-style-type: none"> • Age > 75 years • History of hypertension • Diabetes mellitus • Moderately or severely impaired left ventricular systolic function and/or heart failure | Recommend long-term anticoagulation with an oral vitamin K antagonist, such as warfarin, targeted at an INR of 2.5 (range, 2.0 – 3.0) because of the increased risk of future ischemic stroke faced by this set of patients | 1A |
| <i>*Timing of the initiation of VKA therapy after an acute ischemic stroke involves balancing the risk of hemorrhagic conversion with short-term risk of recurrent ischemic stroke and is addressed in the chapter by Albers et al in this supplement</i> | | | |

Antithrombotic Therapy in Atrial Fibrillation

| 1.1 Atrial Fibrillation (AF) | | | |
|--|--|--|-------|
| Situation | Details | Recommendation | Grade |
| Patients with AF, including those with paroxysmal AF | With only one of the risk factors listed below <ul style="list-style-type: none"> • Age > 75 years • History of hypertension • Diabetes mellitus • Moderately or severe left ventricular systolic function and/or heart failure | Recommend long-term antithrombotic therapy | 1A |
| | | Either as anticoagulation with an oral VKA such as warfarin targeted at an INR of 2.5 (range, 2.0 – 3.0), or | 1A |
| | | As aspirin at a dose of 75 – 325 mg/day | 1B |
| | | For these patients at intermediate risk of stroke, suggest VKA rather than aspirin | 2A |
| | Aged ≤ 75 years and with none of the other risk factors listed above | Recommend long-term aspirin therapy at a dose of 75 -325 mg/day because of their low risk of stroke | 1B |
| 1.2 Atrial Flutter | | | |
| Situation | Details | Recommendation | Grade |
| Patients with atrial flutter | | Recommend that antithrombotic therapy decisions follow the same risk-based recommendations as for AF | 1C |

Antithrombotic Therapy in Atrial Fibrillation

| 1.3 Valvular Heart Disease and AF | | | |
|---|--------------------|---|-------|
| Situation | Details | Recommendation | Grade |
| Patients with AF and mitral stenosis | | Recommend long-term anticoagulation with an oral VKA, such as warfarin, (target INR, 2.5; range 2.0 – 3.0) | 1B |
| Patients with AF and prosthetic heart valves | | Recommend long-term anticoagulation with an oral VKA, such as warfarin, at an intensity appropriate for the specific type of prosthesis (<i>see chapter on “Valvular and Structural Heart Disease in this supplement</i>) | 1B |
| 1.4 AF Following Cardiac Surgery | | | |
| Situation | Details | Recommendation | Grade |
| Patients with AF occurring shortly after open-heart surgery | Lasting ≥ 48 hours | Suggest anticoagulation with an oral VKA, such as warfarin, if bleeding risks are acceptable. The target INR is 2.5 (range, 2.0 – 3.0). | 2C |
| | | Suggest continuing anticoagulation for 4 weeks following reversion to and maintenance of normal sinus rhythm (NSR) particularly if patients have risk factors for thromboembolism | 2C |

Singer DE, et.al. Antithrombotic therapy in atrial fibrillation. American college of chest physicians evidence-based clinical practice guidelines (8th edition). Chest 2008;133:546S–592S

Antithrombotic Therapy in Atrial Fibrillation

2.1 Anticoagulation for Elective Cardioversion of AF

| Situation | Details | Recommendation | Grade |
|--|---|---|-------|
| Patients with AF of ≥ 48 hours or of unknown duration | For whom pharmacologic or electrical cardioversion is planned | Recommend anticoagulation with an oral VKA, such as warfarin, at a target INR of 2.5 (range, 2.0 – 3.0) for 3 weeks before elective cardioversion and for at least 4 weeks after sinus rhythm has been maintained | 1C |
| | Who are undergoing pharmacologic or electrical cardioversion | Recommend either immediate anticoagulation with IV unfractionated heparin (target partial thromboplastin time [PTT], 60 s; range 50 – 70 s), or LMWH (at full deep venous thrombosis [DVT] treatment doses), or at least 5 days of warfarin (target INR of 2.5; range 2.0 – 3.0) at the time of cardioversion and performance of a screening multiplane TEE. If no thrombus is seen, cardioversion is successful, and sinus rhythm is maintained, recommend anticoagulation (target INR 2.5; range 2.0 – 3.0) for at least 4 weeks. If a thrombus is seen on TEE, then cardioversion should be postponed and anticoagulation should be continued indefinitely. Recommend obtaining a repeat TEE before attempting later cardioversion | 1B |

Singer DE, et.al. Antithrombotic therapy in atrial fibrillation. American college of chest physicians evidence-based clinical practice guidelines (8th edition). Chest 2008;133:546S–592S

Antithrombotic Therapy in Atrial Fibrillation

| 2.1 Anticoagulation for Elective Cardioversion of AF | | | |
|--|---|---|-------|
| Situation | Details | Recommendation | Grade |
| Patients with AF of known duration < 48 hours | | Suggest cardioversion be performed without prolonged anticoagulation | 2C |
| | In patients without contraindications to anticoagulation | Suggest beginning IV heparin (target PTT, 60 s; range 50 – 70 s) or LMWH (at full DVT treatment doses) at presentation | 2C |
| | For emergency cardioversion in the hemodynamically unstable patient | Suggest that IV unfractionated heparin (target PTT of 60 s with a target range of 50 to 70 s) or low-molecular weight heparin (at full DVT treatment doses) be started as soon as possible, followed by at least 4 weeks of anticoagulation with an oral VKA, such as warfarin (target INR of 2.5; range 2.0 – 3.0) if cardioversion is successful and sinus rhythm is maintained | 2C |
| Patients with atrial flutter | For cardioversion | Suggest the use of anticoagulants in the same way as for cardioversion of patients with AF | 2C |

HCHD Inpatient

NPSG 3E Considerations

- **Warfarin should be administered at 1700, unless otherwise specified per physician**
- **Pre-printed Heparin Order Forms for infusion are to be used at all times.**
- **Baseline labs should be assessed when writing orders for anticoagulant medications.**

Additional References

1. Ansell J, Hirsh J, Hylek E, et al. Pharmacology and management of the vitamin k antagonists. American college of chest physicians evidence-based clinical practice guidelines (8th edition). CHEST 2008;133:160S-198S.
2. Hirsh J, Fuster V, Ansell J, Halperin JL. American heart association / american college of cardiology foundation guide to warfarin therapy. Circulation 2003;107:1692-1711.
3. The Joint Commission National Patient Safety Goals. www.jointcommission.org. Accessed July 21, 2008.