

# Anticoagulation Therapy Management

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# Unit 3

## Anticoagulation Management



# Anticoagulation Management

## Objectives

1. Explain the rationale for selecting target dosing ranges and specific targets for oral anticoagulation dosing.
2. Determine treatment therapy for a specific patient with multiple co-morbidities for the various thrombotic disorders.



# Anticoagulation Management

## Objectives

3. Describe the effect and degree of significance of specific medications, disease states, food, alcohol and lifestyle changes that may alter oral anticoagulation therapy.
4. Compare and contrast the benefits of a dedicated anticoagulation service and usual anticoagulation management in a physician office setting.



# ACCP Guidelines

- Most recently published in September 2004
- Usually reviewed and published every 3 years
- Based on the following grades of evidence:
  - Grade 1: Risks/benefits clear, recommended in almost all circumstances
  - Grade 2: Risks/benefits uncertain, variations in patient values or physician values may result in different treatment choices
  - Therefore grade 1A is the strongest recommendation and grade 2C is the weakest recommendation



# History of Warfarin

- Used since 1941
- Most widely used anticoagulant in North America
- The name warfarin is an acronym derived from the patent holder, the Wisconsin Alumni Research Foundation
- Initially, coumarin compounds found in spoiled sweet clover, caused cattle to hemorrhage and die (large amount of coumarin in the clover)



# Indications for Warfarin Use

- Atrial Fibrillation
  - Affects 4% of population and 10% of those over the age of 80
  - Annual bleeding occurrences
    - Intracranial – placebo = 0.1%, warfarin = 0.3%
    - Major bleeding – placebo = 1%, warfarin = 1.3%
    - Minor bleeding – placebo = 5.4%, warfarin = 8.6%

Reference – Ann Int Med 124: 970-979, 1996



# Indications for Warfarin Use

- Venous Thromboembolic Disease
  - Prophylaxis is based upon on several factors:
    - Silent nature of the disease
    - High prevalence among hospitalized patients
    - The risk of death or stroke if the diagnosis is missed. Both DVT and PE manifest few symptoms and the clinical diagnosis can be difficult.
  - INR of 2.0-3.0 is effective and avoids an unnecessary risk of hemorrhage
  - Duration of therapy – depends upon pt's. risk factors, 3-6 months for uncomplicated DVT and lifelong for those with recurrence, malignancy or hypercoagulable states



# Indications for Warfarin Use

- Prosthetic Heart Valves
  - Mechanical valves – INR range of 2.5-3.5, lifelong therapy
  - Bioprosthetic valves – INR range of 2.0-3.0, continue warfarin for first 3 months and consider long-term therapy for pts. with Atrial Fibrillation or history of embolism



# Coronary Heart Disease

- The role of warfarin in long-term management of the patient who has had a MI is controversial
- At present there is no clear advantage of warfarin over aspirin in the secondary prevention of MI
- Permanent endovascular prosthetic devices or stents may require the use of warfarin and antiplatelet therapy to prevent re-stenosis.
  - The duration of warfarin therapy varies from 1-4 months, depending upon the type of stent



# Congestive Heart Failure

- Despite the incidence of systemic embolism in patients with CHF of 0.9% to 5.5% per year, there are not current recommendations for the routine use of anticoagulation long-term



# Initiation of Warfarin

- The ACCP recommends an initial starting dose that is the estimated, 5mg/day; this usually results in patients reaching an INR of 2.0-3.0 in 4-5 days.
- The mean daily dose of warfarin for various age groups usually decreases with age



# Initiation of Warfarin

- Use of larger warfarin loading doses is not recommended since it:
  - May increase the risk of hemorrhagic events
  - May induce a hypercoagulable state due to initial drops in Protein C, during the first 36 hours
  - May give a false sense of security that a therapeutic INR has been achieved, when in fact, all the clotting factor activity has not been affected



# Initiation of Warfarin

- Check INR daily until the therapeutic range has been achieved and maintained for at least 2 consecutive days
- Then check INR twice to three times a week for one to two weeks
- Check INR weekly until two consecutive INRs are therapeutic, then bi-weekly until two consecutive INRs are therapeutic
- Then monthly thereafter



# Warfarin Maintenance

- Dose adjustments can be achieved by calculating the total milligrams of warfarin per week and using approximately 10% of that figure to make incremental or decremental changes to the dose



# Bleeding Assessment

- The major complication of anticoagulation therapy is bleeding
- Minor bleeding – bleeding from the gums, nose; bruise easily; cuts bleed longer
- Major bleeding
  - Red, cola or coffee colored urine
  - Dark red or bright red stools
  - Bruises that are larger than usual for no reason
  - Extreme pain in the abdomen or head
  - Excessive menstrual bleeding



# Managing High INRs

- INR <5 – lower dose or omit dose, monitor more frequently and resume at a lower dose when INR therapeutic
- INR >5 – 9 no bleeding – hold 1-2 doses, restart at a lower dose when INR therapeutic. Consider vitamin K, 5mg or less p.o. if increased risk of bleeding



# Managing High INRs

- INR >9 no bleeding – hold dose and give higher dose of Vitamin K (5-10mg p.o.). Monitor INR closely and decrease dose when INR therapeutic
- Serious bleeding at any INR elevation – hold warfarin therapy and vitamin K IV



# Warfarin Drug Interactions

- The most significant drug interactions are related to the clearance of the S-isomer of warfarin, potentiating the anticoagulant effect. These drugs include:
  - Phenylbutazone, sulfinpyrazone, metronidazole, amiodarone and trimethoprim/sulfa
- Antibiotics and antifungals such as cephalosporins, ciprofloxacin, erythromycin and flucanazole can increase warfarin response



# Warfarin Drug Interactions

- Some drugs can decrease the warfarin response:
  - Barbiturates, corticosteroids, sucralfate, estrogens, cholestyramine, griseofulvin, rifampin and carbamazepine inhibit the anticoagulant affect
- Olestra containing foods have recently been implicated in decreasing the anticoagulant effect of warfarin



# Warfarin Drug Interactions

- Amiodarone
  - Potentiates the effects of warfarin
  - Warfarin dosage adjustment necessary
    - Reduce warfarin dose 25-40% depending upon the dose of amiodarone



# Warfarin Drug Interactions

- Herbal therapy can produce interactions with warfarin therapy
  - Ginkgo biloba – inhibits platelet aggregation
  - Garlic – inhibits platelet aggregation
  - St. John's Wort – decreased warfarin affect
  - Ginseng - decreased warfarin affect
  - Dietary supplements (Ensure etc) and Coenzyme Q contain vitamin K



# Adverse Events and Contraindications

- Skin necrosis is the most important non-hemorrhagic side effect of warfarin.
  - Usually seen on 3-8<sup>th</sup> day of therapy and is caused by extensive thrombosis in the venules and capillaries within the sub q fat
  - May be linked to protein C deficiency
  - In pts. with identified protein C deficiency low dose warfarin should be initiated with a very gradual increase in dose over several weeks



# Adverse Events and Contraindications

- Pregnancy
  - Warfarin crosses the placenta and is contraindicated in pregnancy in the US and can cause CNS abnormalities, fetal bleeding or embryopathy
  - Use of heparin and derivatives are preferred when anticoagulants are needed during pregnancy
- Warfarin may be used in the breast fed infant



# Dedicated Anticoagulation Management Service (AMS)

## AMS

1. ACCP has suggested that a coordinated approach of anticoagulation may offer benefits in improved patient outcomes, ↓ hospitalizations and ↓ adverse events associated with anticoagulation therapy

## Usual Care

1. Lack of use of evidence-based anticoagulation guidelines
2. Enormous amount of time spent by provider or nurse contacting patient about INR results
3. Limited time to education pts. about anticoagulation management



# Dedicated Anticoagulation Management Service (AMS)

## AMS

2. Utilize evidence based guidelines to treat patients
3. AMS nurse's only job is to manage pts. anticoagulation
4. Dedicated education tools and time to educate pts.
5. Track outcomes such as % of time in INR range, ER visits, hospitalization and bleeding or clotting events
6. When POC testing used patient is seen by AMS nurse and visit is billed, allowing for income for the service

## Usual Care

4. Lack of use of computer database to track patients and their outcomes
5. INR's drawn at an outside lab or POC testing used but office does not bill for face-to-face visits, so no income for managing anticoagulation patients



# Unit 3 Questions

1. A patient presents to your office with a history of atrial fibrillation of several years and a mitral valve replacement with a mechanical heart valve 2 months ago. What should the patient's target INR range be?
2. Determine treatment therapy for a specific patient with multiple co morbidities for the various thrombotic disorders.



# Unit 3 Questions

## Objectives

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4. Compare and contrast the benefits of a dedicated anticoagulation service and usual anticoagulation management in a physician office setting.



# References

See Anticoagulation Unit 1



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