LTC Nursing Role in the Management of Atrial Fibrillation

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Mercy LIFE

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Disclosure

• Dr. Stefanacci serves as an Associate Professor in Health Policy/Public Health at the University of the Sciences.
• Practices as a LTC geriatrician in PACE program and is an owner/operator of several LTC facilities.
• Educated as part of speakers bureau for Dabigatran and Rivaroxaban.
• Providing consulting services specific to anticoagulation to BI.
<table>
<thead>
<tr>
<th>Identification of Atrial Fibrillation</th>
<th>Aid in Assessing Risk/Benefits of Treatment</th>
<th>Medication Management</th>
<th>Managing Treatment Adverse Events</th>
</tr>
</thead>
</table>

EKG graphic showing heart rate and rhythm.
Three Things to Remember…

1. **Identification of residents that would benefit from treatment** (benefits v risks)
2. Develop an efficient and effective process for **anticoagulation treatment** (testing & rx dosing)
3. Plan for **managing adverse events** (elevated INRs, bleeding, falls)
Identification of Atrial Fibrillation
Prevalence
Age and Risk of Stroke in Atrial Fibrillation
Framingham Study

<table>
<thead>
<tr>
<th>Age group (yrs)</th>
<th>Estimated RR (p values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50–59</td>
<td>2.8 (p&lt;0.01)</td>
</tr>
<tr>
<td>60–69</td>
<td>2.1 (p&lt;0.01)</td>
</tr>
<tr>
<td>70–79</td>
<td>4.9 (p&lt;0.01)</td>
</tr>
<tr>
<td>80–89</td>
<td>7.1 (p&lt;0.001)</td>
</tr>
</tbody>
</table>
Annual Event Rates per Age Groups
According to Risk Factors (Warfarin vs Control)

Adapted from Arch Int Med 1994;154:1454
## Classification

<table>
<thead>
<tr>
<th></th>
<th><strong>Paroxysmal</strong></th>
<th><strong>Persistent</strong></th>
<th><strong>Permanent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>less than 7 days</td>
<td>greater than 7 days</td>
<td>more than 1 year</td>
</tr>
<tr>
<td><strong>Termination</strong></td>
<td>may be recurrent</td>
<td>can be terminated by cardioversion</td>
<td>cardioversion either failed or has not been attempted</td>
</tr>
</tbody>
</table>
Conditions predisposing to, or encouraging progression of AF

- Hypertension
- Symptomatic heart failure (NYHA II - IV) including tachycardiomyopathy
- Valvular heart disease
- Cardiomyopathies including primary electrical cardiac disease
- Atrial septal defect and other congenital heart defects
- Coronary artery disease
- Thyroid dysfunction and possibly subclinical thyroid dysfunction
- Obesity
- Diabetes mellitus
- Chronic obstructive pulmonary disease (COPD) and sleep apnoea
- Chronic renal disease
Pathogenesis

• Underlying heart disease of any cause that is complicated by:
  – heart failure
  – atrial enlargement
  – elevated atrial pressure
  – inflammation or infiltration of the atria

• Echocardiographic risk factors
  – increased left ventricular wall thickness
  – left atrial diameter > 4 cm
  – reduced left ventricular fractional shortening

• Triggering event
  – majority related to atrial premature beat
  – minority related to atrial flutter or atrial tachycardia
Symptoms

- Palpitations, weakness, dizziness, reduced exercise capacity, dyspnea
- Angina, CHF symptoms, syncope (hypotension) relate to underlying heart disease
- Up to 90% of episodes are asymptomatic with approximately 20% of such episodes longer than 48 hrs
- 90% of AF patients have recurrent episodes
Exam

- ABC’s
- Vital signs
  - Rate / BP to assess perfusion and guide decision for urgent / emergent ECV
- Assess for signs of CHF
- Heart tones: variable intensity of S₁ is diagnostic of atrial fibrillation
EKG

- Verification of diagnosis
  - irregularly irregular
  - No discernable P waves

- Identify associated findings or complications
  - MI
  - LVH
  - Bundle branch block
  - Pre-excitation
ECG
Chest X-ray

- Identify heart size, vasculature
- Assess for additional complicating diseases
  - COPD
  - Pneumonia
LAB

- Standard electrolytes – assess for hypokalemia
- TSH and free $T_4$
  - For all cases of new onset Atrial fibrillation
  - Patients with low TSH and normal free $T_4$ have subclinical hyperthyroidism
- INR
  - Most patients with AF will need anticoagulation
  - Patients currently anticoagulated need confirmation of therapeutic level
Elderly patient
Palpitation
Fatigue/weakness
Long term hypertension
Tachycardia
Irregularly irregular rhythm
EKG: atrial fibrillation
waves, inconsistent R-R intervals, absence P waves.

ATRIAL FIBRILLATION
# Clinical Events (outcomes)

<table>
<thead>
<tr>
<th>Outcome parameter</th>
<th>Relative change in AF patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Death</td>
<td>Death rate doubled.</td>
</tr>
<tr>
<td>2. Stroke (includes haemorrhagic stroke and cerebral bleeds)</td>
<td>Stroke risk increased; AF is associated with more severe stroke</td>
</tr>
<tr>
<td>3. Hospitalisations</td>
<td>Hospitalisations are frequent in AF patients and may contribute to reduced quality of life.</td>
</tr>
<tr>
<td>4. Quality of life and exercise capacity</td>
<td>Wide variation from no effect to major reduction. AF can cause cardiac distress through palpitations and other AF-related symptoms</td>
</tr>
<tr>
<td>5. Left ventricular function</td>
<td>Wide variation from no change to tachycardio-myopathy with acute heart failure.</td>
</tr>
</tbody>
</table>
GOALS

- Hemodynamic stabilization
- Ventricular rate control
- Prevention of embolic complication
Aid in Assessing Risk/Benefits of Treatment
Risk factors for stroke and thrombo-embolism

<table>
<thead>
<tr>
<th>Major risk factors</th>
<th>Clinically relevant non-major risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous stroke</td>
<td>CHF or moderate to severe LV systolic dysfunction [e.g. LV EF ≤ 40%]</td>
</tr>
<tr>
<td>TIA or systemic embolism</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Age ≥ 75 years</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td></td>
<td>Age 65-74 years</td>
</tr>
<tr>
<td></td>
<td>Female sex</td>
</tr>
<tr>
<td></td>
<td>Vascular disease</td>
</tr>
</tbody>
</table>

AF = atrial fibrillation; EF = ejection fraction (as documented by echocardiography, radionuclide ventriculography, cardiac catheterization, cardiac magnetic resonance imaging, etc.); LV = left ventricular; TIA = transient ischaemic attack.
CHADS$_2$ Risk

<table>
<thead>
<tr>
<th>CHADS2 Risk</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Age &gt; 75</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
</tr>
<tr>
<td>Stroke or TIA</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHADS2 score</th>
<th>Adjusted stroke rate %/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.9</td>
</tr>
<tr>
<td>1</td>
<td>2.8</td>
</tr>
<tr>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td>4</td>
<td>8.5</td>
</tr>
<tr>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>6</td>
<td>18.2</td>
</tr>
</tbody>
</table>

0=ASA alone
1= either warfarin/NOAC or ASA
2 or more= warfarin/NOAC
### CHA$_2$DS$_2$-VASc

<table>
<thead>
<tr>
<th>CHA2DS2-VASc Risk</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF or LVEF $\leq$ 40%</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Age $\geq$ 75</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
</tr>
<tr>
<td>Stroke/TIA/Thromboembolism</td>
<td>2</td>
</tr>
<tr>
<td>Vascular Disease</td>
<td>1</td>
</tr>
<tr>
<td>Age 65 - 74</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
</tr>
</tbody>
</table>

#### CHA2DS2-VASc score vs. Adjusted stroke rate (%/year)

<table>
<thead>
<tr>
<th>CHA2DS2-VASc score</th>
<th>Adjusted stroke rate (%/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td>4</td>
<td>4.0</td>
</tr>
<tr>
<td>5</td>
<td>6.7</td>
</tr>
<tr>
<td>6</td>
<td>9.8</td>
</tr>
<tr>
<td>7</td>
<td>9.6</td>
</tr>
<tr>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td>9</td>
<td>15.2</td>
</tr>
</tbody>
</table>
# HAS-BLED bleeding risk score

<table>
<thead>
<tr>
<th>Letter</th>
<th>Clinical characteristic*</th>
<th>Points awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Abnormal renal and liver function (1 point each)</td>
<td>1 or 2</td>
</tr>
<tr>
<td>S</td>
<td>Stroke</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Bleeding</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>Labile INR s</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Elderly (e.g. age &gt; 65 years)</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Drugs or alcohol (1 point each)</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>

Maximum 9 points

*Hypertension is defined as systolic blood pressure > 160 mmHg.

INR = international normalized ratio.
Types of Bleeds

• No significant bleeding = Minor bleeding
  – Bruises
  – Reported, but does not require additional testing, referrals or visits

• Serious bleeding = Major bleeding
  – Black tarry stools, blood in urine, hematoma
  – Requiring treatment, medical evaluation or at least 2 units of blood

• Life-threatening bleeding
  – Intracranial hemorrhage, retroperitoneal bleed, leading to cardiac arrest, surgical/angiographic intervention, or irreversible sequelae
Medication Management
Cardioversion

“Elective” cardioversion in the ED
- duration clearly identified less than 48 hrs
- No reversible cause
- low risk of intra-cardiac thrombus formation

Urgent cardioversion
Restoration of sinus rhythm takes precedence over mitigation of thromboembolic risk
Indicated if any of the following is present:
• Active ischemia
• Significant hypotension where LV dysfunction (systolic or diastolic) or valvular disease is a factor
• Severe CHF
• Pre-excitation syndrome (eg WPW)

“Relative” Contraindications to urgent cardioversion
- Duration of episode > 48hrs or uncertain duration
- Associated mitral valve disease, cardiomyopathy or CHF.
  (known EF < 50%)
- Prior history of thromboembolic event
Delayed Cardioversion

- AF duration of 48 hours or duration unknown
- Associated mitral valve disease, cardiomyopathy or CHF
- Prior history of thromboembolic event

- Anticoagulate with a goal INR of 2.0 to 3.0 for at least three weeks before and four weeks after either electrical or pharmacologic cardioversion.
Rate control alone vs rhythm control

Rhythm control strategy

- Advantages:
  - Better exertional capacity
  - Improved cardiac function for CHF patients
  - Mitigation of other arrhythmic related symptoms (eg palpitations)

- Disadvantages:
  - Frequent recurrences of AF – 50% of patient recur in 3-6 months
  - Repeated need for electrical cardioversion;
  - Adverse effects of prophylactic antiarrhythmic drugs including life-threatening events related to proarrhythmic effects

- No clear benefit of either approach for patients over 65 years of age; trend for increased mortality in rhythm control (AFFIRM trial, NEJM 2002, > 4,000 patients)

- Rate control with anticoagulation is acceptable in patients 65 yrs or greater

- Strategy is weighed for acutely symptomatic patient with new onset of Atrial fibrillation, particularly if < 65 yrs
Rate Control

- Indicated if starting Class 1a or 1c antiarrhythmic drug due to possible recurrence with Atrial flutter with 1:1 conduction
- Necessary for prevention of tachycardia-induced left ventricular dysfunction

Agents for rate control

- Beta blockers
  - IV therapy: Metoprolol, Esmolol
  - Oral therapy: Atenolol
- Calcium channel blockers
  - Diltiazem
  - Verapamil
- Digoxin
  - Useful only in CHF patients or as second/third line agent
Indications for hospitalization

• For the treatment of an associated medical problem, which is often the reason for the arrhythmia

• For elderly patients who are more safely treated for AF in hospital

• For patients with underlying heart disease who have hemodynamic consequences from the AF or who are at risk for a complication resulting from therapy of the arrhythmia
Coagulation Cascade

Schematic diagram of the coagulation cascade along the tissue factor pathway and the targets of direct factor Xa and thrombin inhibitors. The vitamin K antagonist warfarin typically works on several calcium-dependent clotting factors, including factors II, VII, IX (not shown), and X.
Warfarin

- Effective
- Reversible
- Inexpensive

- Slow onset of action
- Regular monitoring
- Food interaction
- Medication interaction
- Difficult titration - regular dose adjustments
Warfarin

• When warfarin therapy is started, its anticoagulant effects may not be apparent for several days.
• The duration of action of a single dose is 2–5 days.
• The therapeutic effect of warfarin exists within a narrow therapeutic window as dictated by the INR.
• Considerable inter- and intraindividual dose variability may be affected by a wide range of physiologic (liver and thyroid function), genetic, and environmental (eg, diet, other drugs) factors.\textsuperscript{9,10}
• Regular monitoring is required to avoid excessive or insufficient anticoagulation.\textsuperscript{16}
Shortcomings of Warfarin

- Warfarin therapy requires control of patients’ prothrombin time or international normalized ratio (INR) within a narrow therapeutic range.
- Warfarin levels above the therapeutic range lead to an increased risk of life-threatening bleeding, and levels below the therapeutic range obviate any potential benefits from the drug.
- Ensuring maintenance of therapeutic INRs requires frequent blood testing.
- Multiple dietary and pharmacologic interactions may complicate the maintenance of a therapeutic INR.
# Atrial Fibrillation Trial Comparison

<table>
<thead>
<tr>
<th>Variables</th>
<th>RE-LY (n=18,113)</th>
<th>ROCKET-AF (n=14,264)</th>
<th>ARISTOTLE (n=18,201)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study drug</td>
<td>Dabigatran 150 mg BID</td>
<td>Rivaroxaban 20 mg daily</td>
<td>Apixaban 5 mg BID</td>
</tr>
<tr>
<td>Comparator</td>
<td>Warfarin INR 2-3</td>
<td>Warfarin INR 2-3</td>
<td>Warfarin INR 2-3</td>
</tr>
<tr>
<td>TTR (mean)</td>
<td>64%</td>
<td>55%</td>
<td>62.2%</td>
</tr>
<tr>
<td>Mean Age</td>
<td>71 yo</td>
<td>73 yo</td>
<td>70 yo</td>
</tr>
<tr>
<td>CHADS\textsubscript{2} score</td>
<td>2.2</td>
<td>3.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Primary Outcome</td>
<td>1.11% vs. 1.69% (p&lt;0.001)</td>
<td>2.12% vs. 2.42% (p=0.117)</td>
<td>1.27% vs. 1.6% (p&lt;0.001)</td>
</tr>
<tr>
<td>Major bleeding</td>
<td>3.11% vs. 3.36% (p=0.31)</td>
<td>3.60% vs. 3.46% (p=0.576)</td>
<td>2.13% vs. 3.09% (p&lt;0.001)</td>
</tr>
</tbody>
</table>
# Characteristics of Novel Agents

<table>
<thead>
<tr>
<th>Variables</th>
<th>Dabigatran</th>
<th>Rivaroxaban</th>
<th>Apixaban</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDA approved</td>
<td>October 2010</td>
<td>November 2011</td>
<td>N/A</td>
</tr>
<tr>
<td>Drug Class</td>
<td>DTI</td>
<td>Factor Xa Inhibitor</td>
<td>Factor Xa Inhibitor</td>
</tr>
<tr>
<td>$T_{\text{max}}$ (hrs)</td>
<td>1-3</td>
<td>2-4</td>
<td>1-3</td>
</tr>
<tr>
<td>Half-life (hrs)</td>
<td>14-17</td>
<td>5-9</td>
<td>8-15</td>
</tr>
<tr>
<td>Dose Interval</td>
<td>Twice daily</td>
<td>Once daily</td>
<td>Twice daily</td>
</tr>
<tr>
<td>Renal Dose Adj.</td>
<td>Yes</td>
<td>Yes</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Renal</td>
<td>80%</td>
<td>36%</td>
<td>25%</td>
</tr>
<tr>
<td>Hepatic Impairment</td>
<td>No adjustment</td>
<td>Avoid Use</td>
<td>Caution / Avoid Use</td>
</tr>
<tr>
<td>Other AEs</td>
<td>Dyspepsia</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Possible Monitoring</td>
<td>pTT, ACT</td>
<td>PT, anti-Xa</td>
<td>PT, anti-Xa</td>
</tr>
</tbody>
</table>
Patient Selection

• Novel anticoagulants may be most appropriate for:
  – Unstable INRs on warfarin
  – Difficulty or hardship with INR monitoring
  – CrCl > 30 ml/min
  – History of good medication compliance
  – Patients < 75 years old

• Novel anticoagulants probably not the best choice for:
  – Consistently therapeutic INRs on warfarin
  – Renal dysfunction (dabigatran and rivaroxaban)
  – History of significant GI disease or GI bleeding
  – Medication non-compliance
  – No prescription insurance / unable to afford co-pay
Managing Treatment Adverse Events
<table>
<thead>
<tr>
<th>Indication</th>
<th>Therapeutic Range (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment of venous thrombosis</td>
<td>2.0 – 3.0</td>
</tr>
<tr>
<td>Treatment of pulmonary embolism</td>
<td></td>
</tr>
<tr>
<td>Prevention of systemic embolism</td>
<td></td>
</tr>
<tr>
<td>Tissue heart valves</td>
<td></td>
</tr>
<tr>
<td>Valvular heart disease</td>
<td></td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td></td>
</tr>
<tr>
<td>Prevention of systemic embolism</td>
<td></td>
</tr>
<tr>
<td>Bileaflet mechanical valve in aortic position</td>
<td>2.5 – 3.5 Target = 2.5</td>
</tr>
<tr>
<td>Mechanical prosthetic valves</td>
<td></td>
</tr>
<tr>
<td>Acute Myocardial infarction</td>
<td>2.5 – 3.5 Target = 3.0</td>
</tr>
</tbody>
</table>

Chest 2004;126(3 Suppl):204S-233S
Drug Interactions

Increase Warfarin Response
- NSAIDS, ASA
- Acetaminophen > 2g/d
- Amiodarone
- Quinolones (e.g., Cipro), sulfonamides, metronidazole
- Fibrates
- Ginkgo, Garlic, Ginseng
- Grapefruit

Decrease Warfarin Response
- Phenobarbital
- Carbamazepine
- Phenytoin
- Vitamin K rich foods
  - Green leafy vegetables
<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initially</td>
<td>Daily for at least five days</td>
</tr>
<tr>
<td>Phase 1</td>
<td>Every 3-5 days</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Weekly</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Every 2 weeks</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4-6 weeks</td>
</tr>
</tbody>
</table>

*Until stable for 2 consecutive tests

^More frequent if medication changes that effect INR
INR / TTR Report

TTR = 50%
## Warfarin Maintenance

**Target INR 2.0 - 3.0**

<table>
<thead>
<tr>
<th>INR</th>
<th>Dosage Adjustment</th>
<th>Recheck INR</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.5</td>
<td>↑ Weekly dose by 10-20%, consider extra dose</td>
<td>4 to 8 days</td>
</tr>
<tr>
<td>1.5 – 1.9</td>
<td>↑ Weekly dose by 5-10%^</td>
<td>7 to 14 days</td>
</tr>
<tr>
<td>2.0 – 3.0</td>
<td>No change</td>
<td># of consecutive in-range INRs x 1 week (max:4 wks)</td>
</tr>
<tr>
<td>3.1 – 3.9</td>
<td>↓ Weekly dose by 5-10%*</td>
<td>7 to 14 days</td>
</tr>
<tr>
<td>4.0 - 4.9</td>
<td>Hold 0-1 dose, ↓ weekly dose by 10%</td>
<td>4 to 8 days</td>
</tr>
<tr>
<td>≥ 5.0</td>
<td>Consult MD</td>
<td></td>
</tr>
</tbody>
</table>

^If INR is 1.8 to 1.9, consider no change with repeat INR in 7 to 14 days
*If INR is 3.1 to 3.2, consider no change with repeat INR in 7 to 14 days
# Warfarin Maintenance
## Target INR 2.5 - 3.5

<table>
<thead>
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<th>INR</th>
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<td>4 to 8 days</td>
</tr>
<tr>
<td>1.5 – 2.4</td>
<td>↑ Weekly dose by 5-10%^</td>
<td>7 to 14 days</td>
</tr>
<tr>
<td>2.5 - 3.5</td>
<td>No change</td>
<td># of consecutive in-range INRs x 1 week (max:4 wks)</td>
</tr>
<tr>
<td>3.6 - 4.5</td>
<td>↓ Weekly dose by 5-10%*, consider holding one dose</td>
<td>7 to 14 days</td>
</tr>
<tr>
<td>4.5 - 6.0</td>
<td>Hold 1-2 doses, ↓ weekly dose by 5-15%</td>
<td>2 to 8 days</td>
</tr>
<tr>
<td>&gt; 6.0</td>
<td></td>
<td>Consult MD</td>
</tr>
</tbody>
</table>

^If INR is 2.3 to 2.4, consider no change with repeat INR in 7 to 14 days
*If INR is 3.6 to 3.7, consider no change with repeat INR in 7 to 14 days
## Warfarin Management

<table>
<thead>
<tr>
<th>INR</th>
<th>Dosage Adjustment</th>
</tr>
</thead>
</table>
| 5.0 – 8.9 | If **low risk** of bleeding, omit 1-2 doses, monitor INR more frequently, resume warfarin at 10-20% lower than original dose when INR is at therapeutic range.  
If **high risk** of bleeding, omit 1 dose and give vitamin K1 1-2.5mg orally. Check INR in 24 hours; if still high, administer additional vitamin K1 1-2mg PO. |

*High risk = factors that may influence bleeding risk - Hx of bleeding, stroke, renal & liver insufficiency, anemia, hypertension, other medications*
### Warfarin Management

<table>
<thead>
<tr>
<th>INR</th>
<th>Dosage Adjustment</th>
</tr>
</thead>
</table>
| ≥ 9.0 | With no significant bleeding:  
  Hold warfarin  
  Administer vitamin K1 5-10mg PO  
  Check INR in 24 hours  
  If still high, administer vitamin K1 1-2mg PO  
  Resume warfarin at lower dose when INR is therapeutic |
Identification of Atrial Fibrillation

Aid in Assessing Risk/Benefits of Treatment

Medication Management

Managing Treatment Adverse Events
Three Things to Remember…

1. **Identification of residents that would benefit from treatment** (benefits v risks)

2. Develop an efficient and effective process for **anticoagulation treatment** (testing & rx dosing)

3. Plan for **managing adverse events** (elevated INRs, bleeding, falls)
Discussion

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References
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References


66. The Thrombosis Interest Group of Canada (www.tigc.org)


