



Quality
Insights

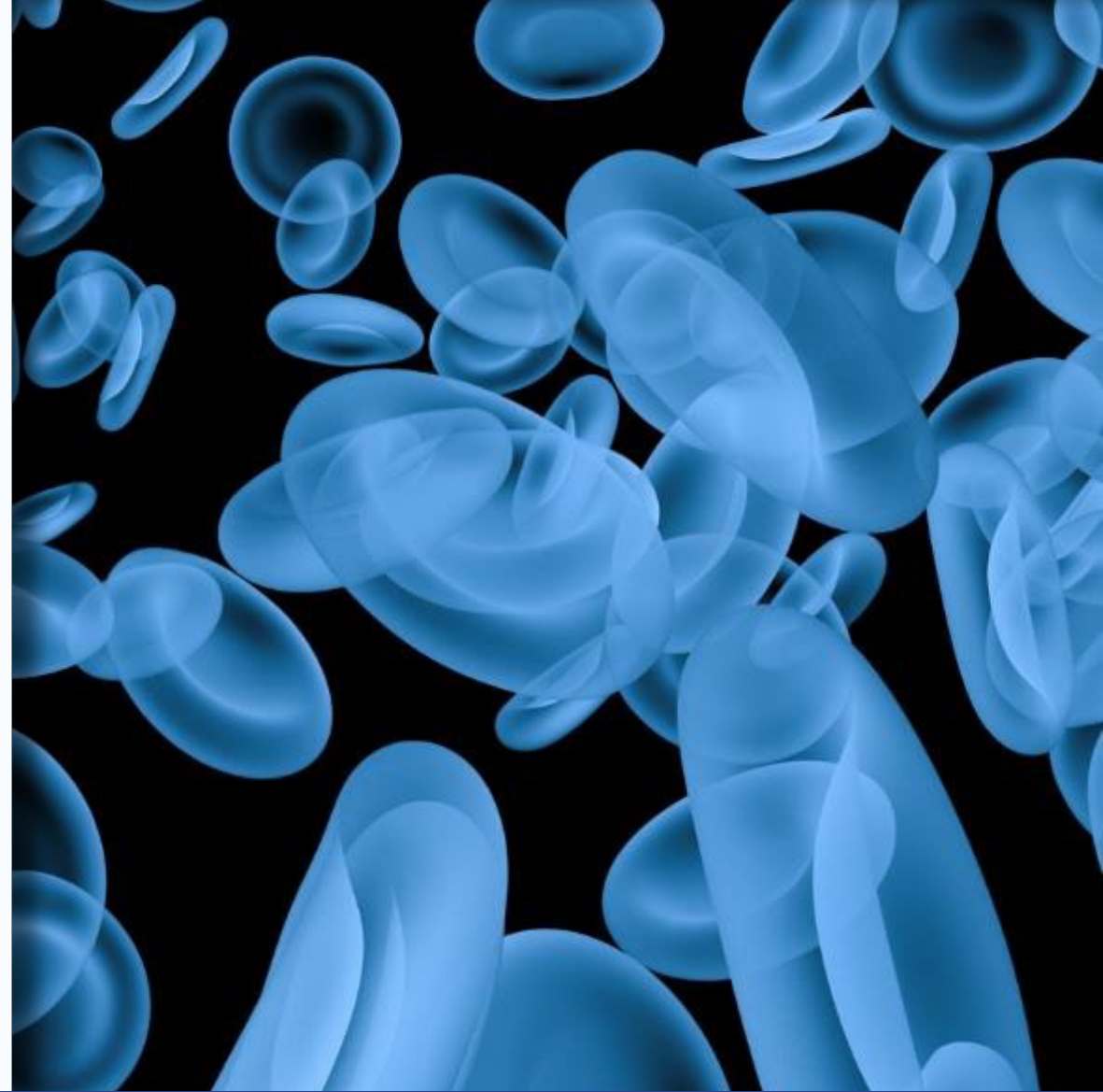
QIN-QIO

Quality Innovation Network -
Quality Improvement Organizations
CENTERS FOR MEDICARE & MEDICAID SERVICES
QUALITY IMPROVEMENT & INNOVATION GROUP

Anticoagulant Adverse Drug Events

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AGENDA

TOPICS TO BE COVERED

- Types of anticoagulants
- What anticoagulants treat
- Who is taking anticoagulants?
- Risk of adverse drug events associated with anticoagulants
- Tools to keep residents safe and reduce risk of ADEs

Learning Objectives

- Understand the major types of anticoagulants and their basic differences
- Describe the indications for starting anticoagulants
- Explain what steps can be implemented to decrease the risk of adverse drug events associated with warfarin
- Recognize the differences in dosing protocols between apixaban and rivaroxaban

Types of Anticoagulants

There are many types of anticoagulants available. Some are more common in the hospital setting. All anticoagulants carry a risk to cause adverse drug events.

**Vitamin K
Antagonist
(warfarin)**

**LMWH, UFH
(enoxaparin,
heparin)**

**Direct Thrombin
Inhibitors
(argatroban,
dabigatran)**

**Factor Xa
inhibitors
(apixaban,
fondaparinux,
Rivaroxaban)**



What Do Anticoagulants Treat?

Venous thromboembolism (VTE)

Oral anticoagulants prevent and treat pulmonary embolism (PE) and deep venous thrombosis (DVT)

Atrial Fibrillation

The prevention of thromboembolic stroke is one of the primary indicators for oral anticoagulant therapy.

Who is Taking Anticoagulants?

- Anticoagulation initiation within 12 months after initial atrial fibrillation diagnosis increased from 20.2% in 2010 to 32.9% in 2020 in adults over 65
- Anticoagulation initiation was less likely among patients at an older age, with dementia, with frailty, and with anemia
- Many older adults also receive incorrect dosage

Atrial Fibrillation

- Most common cardiac arrhythmia
- Associated with an increased risk of stroke
- Risk of developing atrial fibrillation increases with age
- 10 to 17% of individuals over 80 have atrial fibrillation
- Anticoagulants manage thrombotic risks



Caution With Anticoagulants

- Hospitalization rates due to adverse drug effects are 4 times higher in older adults.
- 66% of hospitalizations in older patients are due to only 4 drug classes:
 - Warfarin
 - Insulin
 - Oral anti-platelet drugs
 - Oral hypoglycemic agents

Starting Warfarin

- Before starting warfarin we need to assess and record diagnosis
 - Atrial fibrillation
 - Valvular heart disease
 - PE or DVT
- Assess bleeding risk
- Record target INR range (2-3 in most residents or 3-3.5 in certain conditions such as artificial valves)
- Record expected duration of therapy and include stop date in orders if indicated

Time in Therapeutic Range (TTR)

- The longer the duration of TTR, the greater the risk reduction for adverse effects.
- For residents who have conditions in which warfarin is an appropriate choice:
 - Stroke risk doubles for $\text{INR} < 1.7$
 - Stroke risk triples for $\text{INR} < 1.5$
- Studies have demonstrated that use of a simple dosing algorithm increases time in therapeutic range.

The Safety of Warfarin in the NH Setting

- A study looked at residents receiving warfarin in 25 nursing homes in Connecticut
- 2,946 to 3,212 residents over the 1-year study period
- The researchers determined the amount of time each resident spent in each INR range

INR Values in Residents

INR less than 2

36.5%

INR 2-3

49.6%

INR greater than 3 to less than 4.5

11.9%

INR 4.5 or more

2.0%

Sample Warfarin Adjustments

INR	Dose Change
< 1.5	Increase by 20%
1.6-1.9	Increase by 10%
3.1–3.4	Dose adjustment may not be necessary, or decrease by 10%
3.5–3.9	Decrease by 20%, consider holding one dose
4.0–4.9	Hold dose until INR returns to range then decrease by 20–30%
5-9	Hold dose until INR within range. Consider Vitamin K 1-2.5mg if increased bleeding risk
>9	Hold dose until INR within range. Consider Vitamin K 3-5mg

Tideman PA, Tirimacco R, St John A, Roberts GW. How to manage warfarin therapy. Aust Prescr. 2015 Apr;38(2):44-8. doi: 10.18773/austprescr.2015.016. Epub 2015 Apr 1. Erratum in: Aust Prescr. 2016 Apr;39(2):66. PMID: 26648615; PMCID: PMC4653986.

Hirsh J, Fuster V, Ansell J, Halperin JL; American Heart Association; American College of Cardiology Foundation. American Heart Association/American College of Cardiology Foundation guide to warfarin therapy. Circulation. 2003 Apr 1;107(12):1692-711. doi: 10.1161/01.CIR.0000063575.17904.4E. PMID: 12668507.



Tips for Warfarin Success

Utilize a Flow Sheet

A sheet should be created for each resident with all relevant info

Consider Medication Changes

Many medications interact with warfarin or affect INR

Consider Diet Changes

Foods that contain Vitamin K affect warfarin

Attempt to Use a Simple Dosage Schedule

Doses that change daily can lead to errors

Attempt to check all INRs on Same Day of Week

A schedule makes it easier to flag a missed INR

Starting Direct Oral Anticoagulants (DOAC)

- Assess and record diagnosis
- Assess bleeding risk
- Record expected duration of therapy and include stop date in orders if indicated
- Assess for medication interactions

Starting Apixaban (Eliquis)

- DVT/PE Treatment:
 - 10mg po bid x 7 days then 5mg po bid
 - If converting from warfarin, start when INR < 2
- Thromboembolism/stroke prophylaxis:
 - 5mg po bid
- Decrease dose to 2.5mg po bid if at least 2 are present:
 - 80 years old or older
 - Weight less than 60 kg
 - Creatinine less than 1.5

Starting Rivaroxaban (Xarelto)

- DVT/PE Treatment:
 - 15mg po bid x 21 days then 20mg po qd
 - If converting from warfarin, start when INR < 3
- Thromboembolism/Stroke Prophylaxis
 - 20mg po qd
 - Reduce dose to 15mg po qd if creatinine clearance < 51 or on dialysis

Bleeding Risks (HAS-BLED)

- Hypertension (1 point)
- Abnormal renal or liver function (1 or 2 points)
- Stroke (1 point)
- Bleeding tendencies (1 point)
- Labile INRs (1 point)
- Elderly (age >65) (1 point)
- Drugs predisposing to bleeding (1 point)
- Alcohol (1 point)

DOAC Score

- Assigns points for age, renal function, underweight status, stroke/transient ischemic attack/embolism history, diabetes, hypertension, antiplatelet use, nonsteroidal anti-inflammatory use, liver disease, and bleeding history
- Each additional point scored is associated with a 48.7% increase in major bleeding

What to Do With Bleeding Risk Scores?



Communicate with resident/family

Bleeding risk scores can be utilized to initiate shared decision making conversations.

Communicate with other providers

Bleeding risk scores should be shared with other providers who might write orders to change care plans or add medications

Take into consideration in future events

Bleeding risk score can help inform decisions when anticoagulants are held for procedures or with a fall.

Adverse Drug Events

- Anticoagulation-associated adverse drug events can be due to medication error, adverse drug reactions, or a combination of the 2
- Hospitalization costs associated with anticoagulant-associated ADEs have been estimated at more than \$2.5 billion

Examples of Symptoms of ADEs



Hematuria

Blood in urine

Melena or Hematochezia

Blood in stool or black/dark stool

Ecchymosis

Severe bruising

Hematemesis

Vomiting blood or dark contents
("coffee grounds")

Epistaxis


Severe, prolonged nosebleed

How to Manage My Blood Thinner


Name _____ Date _____

Your Medication _____ Your Goal International Normalized Ratio (INR): _____


If you . . .	You should . . .
<ul style="list-style-type: none">• Are feeling well and healthy• Are able to do all your activities• Are taking the blood thinner at the same time every day	<ul style="list-style-type: none">• Continue taking medications as ordered.• Keep all physician appointments.• Refill any medications as needed. <p>If taking Warfarin:</p> <ul style="list-style-type: none">• Keep your appointments to get your INR checked.• Keep diet consistent; keep diet unchanged for foods high in vitamin K (such as green, leafy vegetables).• Avoid taking herbal supplements before talking with your provider.¹



If you . . .	You should . . .
<ul style="list-style-type: none">• Have heavy bleeding from gums• Have bruises for no reason• Are prescribed ANY new medication or begin taking an over-the-counter medication• Are scheduled for a procedure, surgery, or major dental work	<p>Contact your doctor/nurse practitioner now. If your medical provider is not available, contact the provider on call.</p> <p>Notify your provider:</p> <ul style="list-style-type: none">• If you are taking Warfarin (Coumadin) and not having routine lab tests• Before taking over-the-counter¹ medications <p>Contact:</p> <p>Doctor/nurse practitioner: _____</p> <p>Phone: _____</p> <p>After-hours on-call number: _____</p>



If you . . .	You should . . .
<ul style="list-style-type: none">• Have difficulty breathing or chest pain• Have uncontrolled bleeding that you cannot stop in five minutes when pressure is applied• Have vomit that looks like coffee grounds• Have urine that is pink, brown, or red• Have stools that are dark brown, black, or red• Have blurred vision in one or both eyes• Have severe stomach or back pain, headache, dizziness, fainting, or body weakness• Have a major accident, serious fall, or hit your head (even if you don't look hurt), or a change in memory	<p>Call 911 or go to the Emergency Department to seek medical attention!</p>



¹ EPMA Journal, "Review of Herbal Medications with Potential to Cause Bleeding"

Take-Home Points

- Anticoagulants are responsible for a large amount of adverse drug events in the long-term care population
- Warfarin dosing should be monitored closely to reduce risks of bleeding and time out of therapeutic range
- All patients taking anticoagulants should have a bleeding risk score done and the results should be used in shared decision making conversations



Questions?

Connect With Us!



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